Table of Contents

Inside front cover - Catalog/Responsibility/Contacts

Use of Social Security Number 30
EEO/Title IX/Section 504 Statement 30
Security Information 30
Drug-Free Campus and Workplace 30
Policy for the Administration of Graduate Assistantships 31

Student Services
Black Cultural Center 33
Career Services 33
Center for International Education 33
Child Care 34
Dining Services Facilities 34
Disability Services 34
Graduate Student Association 34
Hearing and Speech Services 34
Housing 34
Minority Student Affairs 35
Religious Resources 35
Student Counseling Services Center 35
Student Health Service 35
Vehicle Operation and Parking 35
Women's Center 35

Colleges
College of Agricultural Sciences and Natural Resources 39
College of Architecture and Planning 39
College of Arts and Sciences 40
College of Business Administration 40
College of Communications 41
College of Education 41
College of Engineering 42
College of Human Ecology 42
College of Law 42
College of Nursing 43
College of Social Work 43
College of Veterinary Medicine 43

Fields of Instruction
Accounting and Business Law 47
Advertising 48
Agricultural and Extension Education 49
Agricultural and Biosystems Engineering 49
Agricultural Economics and Rural Sociology 51
Agriculture 52
Animal Science 53
Anthropology 54
Architecture 56
Art 58
Audiology and Speech Pathology 61
Aviation Systems 63
Biochemistry and Cellular and Molecular Biology 64
Biomedical Sciences 65
Botany 66
Broadcasting 67
Business Administration 68
Chemical Engineering 73
Chemistry 74
Child and Family Studies 75
Civil and Environmental Engineering 77
Classics 79
Communications 80

Comparative and Experimental Medicine 81
Computer Science 83
Consumer and Industry Services Management 84
Counselor Education and Counseling Psychology 87
Cultural Studies in Education 88
Ecology and Evolutionary Biology 89
Economics 90
Education 92
Education in the Sciences, Mathematics, Research, and Technology 95
Electrical Engineering 96
English 99
Entomology and Plant Pathology 102
Exercise Science 103
Finance 103
Food Science and Technology 104
Forestry, Wildlife and Fisheries 105
Geography 107
Geological Sciences 108
Germanic, Slavic and Asian Languages 110
Health and Safety Sciences 111
History 114
Holistic Teaching/Learning 115
Human Ecology 117
Human Resource Development 118
Inclusive Early Childhood Education 120
Industrial and Organizational Psychology 120
Industrial Engineering 121
Information Sciences 124
Interdisciplinary Programs 126
Journalism 127
Language, Communication, and Humanities Education 128
Law 129
Leadership Studies in Education 132
Life Sciences 134
Management 135
Management Science 135
Marketing, Logistics and Transportation 137
Materials Science and Engineering 137
Mathematics 139
Mechanical and Aerospace Engineering 142
Microbiology 147
Music 148
Nuclear Engineering 150
Nutrition 152
Ornamental Horticulture and Landscape Design 156
Philosophy 157
Physics and Astronomy 158
Plant Science 160
Plant and Soil Sciences 162
Political Science 163
Psychoeducational Studies 165
Psychology 167
Rehabilitation, Deafness, and Human Services 169
Religious Studies 170
Romance Languages 171
Social Work 174
Sociology 177
Special Programs 176
Speech Communication 176
Sport and Physical Activity 179
Statistics 179
Theatre 181
Veterinary Medicine 183

Facilities for Research and Service
Bureau of Educational Research and Service 187
Center for Business and Economic Research 187
Center for Information Studies 187
Center for Literacy Studies 187
Center for Physical Activity and Health 187
Center of Excellence for Materials Processing 188
Centers and Chairs of Excellence 188
Child Development Laboratories 188
Communications Research Center 188
Division of Information Infrastructure 188
Energy, Environment, and Resources Center 189
English Language Institute 189
Institute for Tourism and Leisure Industries 189
Institute of Agriculture 189
Libraries, The University of Tennessee, Knoxville 190
Maintenance and Reliability Center 190
Management Development Center 191
Measurement and Control Engineering Center 191
Nutrition Institute 191
Off-Campus Graduate Centers 192
Psychological Clinic 192
Research Consortiums 192
Textiles and Nonwovens Development Center 192
Transportation Center 193
University Evening School 193
University of Tennessee Space Institute 193
Water Resources Research Center 194

Index

Map of Campus
University Calendar for 1998-99

Summer Term 1998

June 4 (Thursday) Classes Begin
July 3 (Friday) Independence Day
July 8 (Wednesday) First Session Ends
July 9 (Thursday) Second Session Begins
August 12 (Wednesday) Second Session Ends
August 14 (Friday) Commencement

Fall Semester 1998

August 26 (Wednesday) Classes Begin
September 7 (Monday) Labor Day
October 15-16 (Thursday-Friday) Fall Break
November 26-27 (Thursday-Friday) Thanksgiving
December 10 (Thursday) Classes End
December 11 (Friday) Study Period
December 12, 14-17 (Saturday, Monday-Thursday) Final Exams
December 20 (Sunday) Commencement

Spring Semester 1999

January 13 (Wednesday) Classes Begin
January 18 (Monday) Martin Luther King Day
March 15-19 (Monday-Friday) Spring Break
April 2 (Friday) Spring Recess
May 3 (Monday) Classes End
May 4-5 (Tuesday-Wednesday) Study Period
May 6-8, 10-11 (Thursday-Saturday, Monday-Tuesday) Final Exams
May 14 (Friday) Commencement

Summer Term 1999

June 3 (Thursday) Classes Begin
July 5 (Monday) Independence Day
July 7 (Wednesday) First Session Ends
July 8 (Thursday) Second Session Begins
August 11 (Wednesday) Second Session Ends
August 13 (Friday) Commencement

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

Board of Trustees

Ex Officio Members

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

From Anderson, Bedford, Coffee, Franklin, Lincoln, Moore, and Warren Counties
J. Steven Ennis

From Davidson County
Clayton McWhorter

From Hamilton County
Frank J. Kinser

From Knox County
Susan Richardson-Williams

From Shelby County
Arnold E. Perl
Lucy Y. Shaw

From Congressional Districts

DISTRICT
First
Second
Third
Fourth
Fifth
Sixth
Seventh
Eighth
Ninth
TERM EXPIRES
June 1, 1999
June 1, 2000
June 1, 2001
June 1, 2002
June 1, 1999
June 1, 2000
June 1, 2001
June 1, 2002
June 1, 2001

From Weakley County

TERM EXPIRES

Barbara C. Castleman
July 1, 1998

Student Member
Sharmelle Thomas

Faculty Member
Martha Butterfield

Officers of the Board
Governor Don Sundquist, Chairman
J. Steven Ennis, Vice Chairman
Beauchamp E. Brogan, Secretary
Linda Logan, Assistant Secretary

University of Tennessee Administration

Joseph E. Johnson, B.S., M.A., Ed.D., President, The University of Tennessee
Billy Stair, B.A., M.A., Executive Assistant to the President
Emerson H. Fly, B.S., CPA, Executive Vice President and Vice President for Business and Finance
Horner S. Fisher, B.S., M.B.A., Senior Vice President
Charles F. Brakebill (Emeritus), B.S., Vice President for Development
D.M. (Pete) Gossett, B.S., M.S., Ph.D., Vice President for Agriculture
T. Dwayne McCay, B.S., M.S., Ph.D., Vice President of the UT Space Institute
William R. Rice, A.B., J.D., Chancellor and Vice President for Health Affairs
Sammie Lynn Puett, B.S., M.S., APR, Vice President for Public Service, Continuing Education, and University Relations
Beauchamp E. Brogan, B.S., LL.B., J.D., General Counsel
Charles M. Pecollo, Jr., B.S., M.Acc., CPA, CCM, Treasurer

UT, Knoxville Administration

William T. Snyder, B.S., M.S., Ph.D., Chancellor
John G. Peters, A.B., M.A., Ph.D., Vice Chancellor for Academic Affairs
Susan B. Mettlen, B.A., M.Ed., Ed.S., Ed.D., Vice Chancellor for Information Infrastructure
Philip A. Scheurer, B.A., M.S., Vice Chancellor for Administration and Student Affairs
Rickey McCurry, B.S., J.D., Acting Vice Chancellor for Development and Alumni Affairs
Michael Devine, B.S., Ph.D., Vice Chancellor for Research
C.W. Minkel, B.A., M.A., Ph.D., Associate Vice Chancellor for Academic Affairs and Dean of The Graduate School and Acting Director of the School of Information Sciences
Clifton Woods, III, B.S., M.S., Ph.D., Associate Vice Chancellor for Academic Affairs
Raymond L. Hamilton, B.S., M.Acc., CPA, Executive Director, Budget and Finance
Faye Julian, B.A., M.A., Ph.D., Dean of Undergraduate Academic Affairs and Director of the Center for Undergraduate Excellence
John Riley, B.S., M.S., Ph.D., Dean of the College of Agricultural Sciences and Natural Resources
Marleen K. Davis, B.Arch., M.Arch., Dean of the College of Architecture and Planning
Lorayne W. Lester, B.S., M.A., Ed.D., Dean of the College of Arts and Sciences
C. Warren Neel, B.S., M.B.A., Ph.D., Dean of the College of Business Administration
Dwight L. Traylor, A.B., M.J., Ph.D., Dean of the College of Communications
C. Glennon Howell, B.S., M.A., Ed.D., Interim Dean of the College of Education
Jerry E. Stoneking, B.S., M.S., Ph.D., Dean of the College of Engineering
Jacquelyn O. DaLonge, B.S., M.A., Ph.D., Dean of the College of Human Ecology
Richard S. Wirtz, B.A., M.P.A., J.D., 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
G. Michael H. Shires, B.V.Sc., M.S., M.R.C.V.S., Dip. A.C.V.S., Dean of the College of Veterinary Medicine
Linda Painter, B.S., M.S., Ph.D., Interim Associate Vice Chancellor and Dean of Continuing Studies and Distance Education
Susie C. Archer, B.S., M.A., Dean of Admissions (Undergraduate) and Records
Raymond A. Popp, B.S., M.A., Ph.D., Director of the UT-Oak Ridge Graduate School of Biomedical Sciences
Paula T. Kaufman, A.B., M.S., MBA, Dean of Libraries

TERM EXPIRES

June 1, 2002

Sharmelle Thomas
July 1, 1998

Martha Butterfield
July 1, 1998

From Weakley County

TERM EXPIRES

Barbara C. Castleman
June 1, 2002
The Graduate School Administration

C.W. Minkel, B.A., M.A., Ph.D., Associate Vice Chancellor and Dean of The Graduate School
Jan Allen, B.S., M.S., Ph.D., Assistant Dean of The Graduate School

Michael Singletary, B.A., M.A., Ph.D., Associate Dean of The Graduate School
S. Kay Reed, B.S., M.S., M.A., Ph.D., Assistant to the Dean
Diana C. Lopez, B.S., M.S., Director, Graduate Admissions and Records

The Graduate Council (Membership August 1, 1997)

Ex Officio Members
Dr. C.W. Minkel, Graduate Council Chairman
Dr. Jan Allen, The Graduate School
Dr. Bill Blass, Chairman of the Research Council
Dr. Judith Fiene, College of Social Work
Dr. Thomas W. George, College of Education
Dr. Herb Howard, College of Communications
Ms. Paula Kaufman, Dean of Libraries
Dr. Jim Moran, College of Human Ecology
Dr. David Patterson, College of Architecture and Planning
Dr. Leon Potgieter, College of Veterinary Medicine

College or Unit  Elected Members  Expiration  Proxy

Arch. & Planning  Mr. Jon Coddington  July 31, 1998  Mr. J. William Rudd
Arts & Sciences  Dr. Fred Grimm  July 31, 1998  Dr. Richard Aquila
                Dr. Kathleen D. Lawler  July 31, 1998  Dr. Carl Cobb
                Dr. Lee Magid  July 31, 1998  Dr. Michael Lofaro
                Dr. Kula Misra  July 31, 1998  Dr. Gordon Burghardt
                Dr. Mary Papka  July 31, 1998  TBD
                Dr. Lyle W. Konigsberg  July 31, 1998  Dr. L. J. DeCuir
                Dr. Wesley G. Morgan  July 31, 1998  TBD
                Dr. David C. Wilson  July 31, 1998  TBD

Biomedical Sciences  Dr. Raymond A. Popp  July 31, 1998  Mr. George H. Gregg
Business Administration  Dr. Joseph Rentz  July 31, 1999  Dr. Dan Murphy
                        Dr. Henry Herzog  July 31, 2000  Dr. George Philippatos
Communications  Dr. Barbara Moore  July 31, 1999  Dr. Mark Miller

Education  Dr. Larry Coleman  July 31, 1998  Dr. Ian Rookett
                Dr. Robert Williams  July 31, 1998  Dr. William Poppen
                Dr. Ralph Brockett  July 31, 1999  Dr. Kathleen Davis
                Dr. Olga Welch  July 31, 1999  Dr. Jeff Aper
                Dr. Patricia Beitel  July 31, 2000  Dr. James Miller

Engineering  Dr. A. J. Baker  July 31, 1998  Dr. Reece Roth
                Dr. Paul Crilly  July 31, 1998  Dr. Paul Bienkowski
                Dr. Jack Weitsman  July 31, 1998  Dr. Peter Green
                Dr. Wayne Davis  July 31, 2000  Dr. Walter L. Green

Graduate Student Association  Ms. Janel Prescott  April 30, 1998  Dr. Cheryl Buehler
                Mr. Chris Hogan  April 30, 1998  Dr. Delores Smith
                Ms. Kadesha Washington  April 30, 1998  TBD

Human Ecology  Dr. Jim Bailey  July 31, 1998  Ms. Melinda Davis
                Dr. Jay Whelan  July 31, 1998  TBD
                Dr. Greer Litton Fox  July 31, 1999  Dr. Gretchen Whitney

Law  Dr. D. Cheryn Picquet  July 31, 2000  Dr. Terri Combs-Orme

Nursing  Dr. Pat Dropplem  July 31, 1998  Dr. David Patterson

School of Information Sciences  Dr. Richard Pollard  July 31, 2000  Dr. Kenneth Kimble

Social Work  Dr. Cynthia Rocha  July 31, 1998  Dr. David Slauson
                Dr. Tom Cruthirds  July 31, 1998  TBD

UT Space Institute  Dr. Frank G. Collins  July 31, 1998  TBD

Veterinary Medicine  Dr. Kevin Hahn  July 31, 2000  TBD
GRADUATE STUDY
Rules, policies, fees, and courses described in this catalog are subject to change without notice. Refer to inside front cover.
The University of Tennessee is the official land-grant institution for the State of Tennessee, with its main campus in Knoxville. UT Knoxville is the state's largest and most comprehensive institution, and is the only state-supported "Research University I" (Carnegie classification) in Tennessee. The University of Tennessee, Knoxville is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1868 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 45 fields, and 2 professional programs. More than 6,000 graduate and professional students are enrolled on and off campus under the tutelage of 1,500 faculty members.

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

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

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

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

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

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

Graduate education has been conducted at The University of Tennessee since 1821. The first known master's degree was awarded in 1827. In 1879 the Board of Trustees created a graduate department with authority to confer the Master of Arts, the Doctor of Philosophy, Civil Engineer, and Mining Engineer degrees. The Graduate Department was renamed The Graduate School in 1912. Although a Ph.D. degree was awarded in 1866 and in 1887, formal doctoral programs were not instituted until 1929 for Biological Sciences at Memphis and 1943 for Chemistry on the Knoxville campus. A Committee on Graduate Study was appointed in 1904 and coordinated the graduate programs until the Graduate Council was formed in 1949. More than 8,100 doctoral degrees and 49,600 master's degrees have been awarded to date.

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

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

<table>
<thead>
<tr>
<th>MAJOR</th>
<th>DEGREE</th>
<th>GRE</th>
<th>RATING</th>
<th>DEPT. REQ.</th>
<th>THESIS REQ'D</th>
<th>LANGUAGE REQ'D</th>
<th>CONCENTRATIONS AVAILABLE/ EVALUATION DATES/PHONE (AREA CODE: 423)</th>
</tr>
</thead>
<tbody>
<tr>
<td>College of Agricultural Sciences &amp; Natural Resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agricultural &amp; Extension Education*</td>
<td>MS</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>Agricultural education, agricultural extension education. (974-7308, <a href="mailto:ffsally@utk.edu">ffsally@utk.edu</a>)</td>
</tr>
<tr>
<td>Agricultural Economics*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>MS-agribusiness, agricultural economics, rural sociology. PHD-agricultural marketing &amp; price analysis, agricultural policy, farm management &amp; production economics, natural resource economics, rural development. (974-7231, <a href="mailto:benelsh@utk.edu">benelsh@utk.edu</a>)</td>
</tr>
<tr>
<td>Animal Science*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td></td>
<td>X</td>
<td></td>
<td>MS-breeding, management (beef cattle, dairy cattle, swine, poultry), nutrition, physiology, PHD-animal anatomy, animal breeding, animal management, animal nutrition, animal physiology. (974-7286, <a href="mailto:gottlin@utk.edu">gottlin@utk.edu</a>)</td>
</tr>
<tr>
<td>Biosystems Engineering*</td>
<td>MS</td>
<td>G,S</td>
<td>3</td>
<td></td>
<td>X</td>
<td></td>
<td>PHD-agricultural electrical &amp; electronic systems, agricultural power &amp; machinery, agricultural structures &amp; environment, food &amp; process engineering, soil &amp; water conservation engineering. (974-7266, <a href="mailto:cmote@utk.edu">cmote@utk.edu</a>)</td>
</tr>
<tr>
<td>Biosystems Engineering Technology*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(974-7266, <a href="mailto:cmote@utk.edu">cmote@utk.edu</a>)</td>
</tr>
<tr>
<td>Entomology &amp; Plant Pathology*</td>
<td>MS</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>Entomology, plant pathology. Evaluate Mar 15 for Fall and Summer, Oct 15 for Spring. (974-7135, <a href="mailto:ggerhard@utk.edu">ggerhard@utk.edu</a>)</td>
</tr>
<tr>
<td>Food Science &amp; Technology*</td>
<td>MS</td>
<td>PHD</td>
<td>G</td>
<td></td>
<td>X</td>
<td></td>
<td>PHD-food chemistry, food microbiology, food processing, sensory evaluation of foods. (974-7331, <a href="mailto:menny1@utk.edu">menny1@utk.edu</a>)</td>
</tr>
<tr>
<td>Forestry*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td></td>
<td>X</td>
<td></td>
<td>(974-7126, <a href="mailto:ghopper@utk.edu">ghopper@utk.edu</a>)</td>
</tr>
<tr>
<td>Ornamental Horticulture &amp; Landscape Design*</td>
<td>MS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Floriculture science &amp; technology, nursery science &amp; technology, turfgrass science &amp; technology. (974-7324, <a href="mailto:aberry1@utk.edu">aberry1@utk.edu</a>)</td>
</tr>
<tr>
<td>Plant &amp; Soil Science*</td>
<td>MS</td>
<td>PHD</td>
<td>G</td>
<td></td>
<td>X</td>
<td></td>
<td>MS &amp; PHD-crop physiology &amp; ecology, plant breeding &amp; genetics, soil science. (974-6818, <a href="mailto:carlsams@utk.edu">carlsams@utk.edu</a>)</td>
</tr>
<tr>
<td>Wildlife &amp; Fisheries Science*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td></td>
<td>X</td>
<td></td>
<td>(974-7126, <a href="mailto:ghopper@utk.edu">ghopper@utk.edu</a>)</td>
</tr>
<tr>
<td>College of Architecture &amp; Planning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Architecture*</td>
<td>MArch</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>First professional degree. Admit Summer and Fall only. Evaluate Feb 1. (974-3266)</td>
</tr>
<tr>
<td>Planning*</td>
<td>MSP</td>
<td>+ G</td>
<td>2</td>
<td></td>
<td>X</td>
<td></td>
<td>Environmental planning, land use planning, real estate development planning, transportation planning. Admit Summer and Fall only. (974-5227, <a href="mailto:dpatton@utk.edu">dpatton@utk.edu</a>)</td>
</tr>
<tr>
<td>College of Arts and Sciences</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anthropology</td>
<td>MA</td>
<td>+ G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td></td>
<td>MA &amp; PHD-anthropology, biological anthropology, cultural anthropology, zoosarchology. Admit Fall only. Evaluate Jan 15. (974-4408, <a href="mailto:dpatton@utk.edu">dpatton@utk.edu</a>)</td>
</tr>
<tr>
<td>Art*</td>
<td>MFA</td>
<td>+</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>Ceramics, drawing, graphic design, painting, media arts, printmaking, sculpture, watercolor, inter-area studies, Portfolio required. Admit Fall only. (974-3408, <a href="mailto:chodor1@utk.edu">chodor1@utk.edu</a>)</td>
</tr>
<tr>
<td>Audiology*</td>
<td>MA</td>
<td>+ G</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>Admit Fall only. (974-5019, <a href="mailto:kgross@utk.edu">kgross@utk.edu</a>)</td>
</tr>
<tr>
<td>Biochemistry and Cellular and Molecular Biology*</td>
<td>MS</td>
<td>+ G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td></td>
<td>MS &amp; PHD-anatomy, bromyology, cytology, cytogenetics, ecology, genetics, ichemorology, morphology, mycology, photobiology, physiology, psychology, taxonomy. Evaluate for Fall Jan 7. (974-2556, <a href="mailto:walter@utk.edu">walter@utk.edu</a>)</td>
</tr>
<tr>
<td>Botany*</td>
<td>MS</td>
<td>PHD</td>
<td>G</td>
<td></td>
<td>X</td>
<td></td>
<td>MS &amp; PHD-analytical chemistry, environmental chemistry, inorganic chemistry, organic chemistry, polymer chemistry, physical chemistry. PHD only-chemical physics (In cooperation with Physics Department), theoretical chemistry. (974-3141, <a href="mailto:cfeigerl@utk.edu">cfeigerl@utk.edu</a>)</td>
</tr>
<tr>
<td>Chemistry*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>(974-5067, <a href="mailto:delraight@utk.edu">delraight@utk.edu</a>)</td>
</tr>
<tr>
<td>Computer Science*</td>
<td>MS</td>
<td>PHD</td>
<td>G</td>
<td></td>
<td>X</td>
<td></td>
<td>(974-5067, <a href="mailto:delraight@utk.edu">delraight@utk.edu</a>)</td>
</tr>
<tr>
<td>MAJOR</td>
<td>DEGREE</td>
<td>GRE</td>
<td>RATING FORM</td>
<td>DEPT. REQ.*</td>
<td>THESIS REQ'D.</td>
<td>LANGUAGE REQ'D.</td>
<td>CONCENTRATIONS AVAILABLE/ EVALUATION DATES/PHONE (AREA CODE: 423)</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>--------</td>
<td>-----</td>
<td>-------------</td>
<td>-------------</td>
<td>---------------</td>
<td>----------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>Ecology &amp; Evolutionary Biology*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td></td>
<td>MS &amp; PHD-behavior, ecology, evolutionary biology.</td>
</tr>
<tr>
<td></td>
<td>PHD</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English*</td>
<td>MA</td>
<td>G,S</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>MA-writing, Degree-seeking students only. Admit Fall only. Evaluate Feb 15. (974-6633, <a href="mailto:mtholen@utk.edu">mtholen@utk.edu</a>)</td>
</tr>
<tr>
<td></td>
<td>PHD</td>
<td>G,S</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>See Modern Foreign Languages for Ph.D. (974-2311, <a href="mailto:jromals@utk.edu">jromals@utk.edu</a>)</td>
</tr>
<tr>
<td>French*</td>
<td>MA</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geography*</td>
<td>MS</td>
<td>+ G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>Evaluate assistantship applications Feb 15. 974-24188, <a href="mailto:utkgog@utk.edu">utkgog@utk.edu</a>)</td>
</tr>
<tr>
<td></td>
<td>PHD</td>
<td>+ G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td></td>
<td>Evaluate Feb 15. (974-2366, <a href="mailto:sdi@utk.edu">sdi@utk.edu</a>)</td>
</tr>
<tr>
<td>Geology*</td>
<td>MS</td>
<td>G</td>
<td>2</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PHD</td>
<td>G</td>
<td>2</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>German*</td>
<td>MA</td>
<td></td>
<td>X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History*</td>
<td>MA</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PHD</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life Sciences*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>MS &amp; PHD- plant physiology &amp; genetics. MS only- biotechnology. (974-6841, <a href="mailto:mcalv@utk.edu">mcalv@utk.edu</a>)</td>
</tr>
<tr>
<td>Mathematics*</td>
<td>MS</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PHD</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microbiology*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PHD</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modern Foreign Languages*</td>
<td>PHD+</td>
<td></td>
<td>3</td>
<td>X X</td>
<td></td>
<td></td>
<td>First concentration-French, German, Spanish. Second concentration-Application Linguistics, French, German, Italian, Portuguese, Russian, Spanish. (974-3421, <a href="mailto:lauckner@utk.edu">lauckner@utk.edu</a>)</td>
</tr>
<tr>
<td>Music*</td>
<td>MM</td>
<td></td>
<td>2</td>
<td>X</td>
<td></td>
<td></td>
<td>Accompanying, choral conducting, composition, instrumental conducting, jazz, music education, musicology, performance (organ, piano, strings, voice, winds, percussion), piano pedagogy &amp; literature, sacred music, string pedagogy, theory. Audition required. (974-3313, <a href="mailto:canders@utk.edu">canders@utk.edu</a>)</td>
</tr>
<tr>
<td>Philosophy*</td>
<td>MA</td>
<td>+ G</td>
<td>3</td>
<td>X X</td>
<td></td>
<td></td>
<td>MA &amp; PHD-medical ethics, philosophy. MA only-religious studies. Admit Fall only. (974-3252, <a href="mailto:jnolly@utk.edu">jnolly@utk.edu</a>)</td>
</tr>
<tr>
<td></td>
<td>PHD</td>
<td>+ G</td>
<td>3</td>
<td>X X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physics*</td>
<td>MS</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>MS &amp; PHD-astrophysics, atomic &amp; low temperature physics, biophysics, chemical physics, condensed matter &amp; surface physics, elementary particle physics, molecular spectroscopy, nuclear physics, theoretical physics. MS only- geophysics, health physics. Rating forms required only for consideration for teaching assistantships. (974-3252, <a href="mailto:roolin@utk.edu">roolin@utk.edu</a>)</td>
</tr>
<tr>
<td></td>
<td>PHD</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Political Science*</td>
<td>MA</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>MA-experimental psychology, general psychology. PHD-clinical psychology, experimental psychology. Admit Fall only. Evaluate Feb 15. (974-3259, <a href="mailto:mcalv@utk.edu">mcalv@utk.edu</a>)</td>
</tr>
<tr>
<td></td>
<td>PHD</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychology*</td>
<td>MA</td>
<td>G</td>
<td>4</td>
<td>X</td>
<td></td>
<td>X</td>
<td>MA &amp; PHD-crimeology, energy, environment &amp; resource policy, political economy. Admit Fall only. Evaluate Feb 15. (974-7332, <a href="mailto:psm@utk.edu">psm@utk.edu</a>)</td>
</tr>
<tr>
<td></td>
<td>PHD</td>
<td>G,S</td>
<td>4</td>
<td>X X</td>
<td></td>
<td></td>
<td>See Modern Foreign Languages for Ph.D. (974-3211, <a href="mailto:handelsman@utk.edu">handelsman@utk.edu</a>)</td>
</tr>
<tr>
<td>Public Administration*</td>
<td>MPA</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sociology*</td>
<td>MA</td>
<td>+ G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PHD</td>
<td>+ G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spanish*</td>
<td>MA</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speech &amp; Hearing Science*</td>
<td>PHD+</td>
<td></td>
<td>3</td>
<td>X X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speech Pathology*</td>
<td>MA</td>
<td>G</td>
<td>2</td>
<td></td>
<td></td>
<td>X</td>
<td>Admit Fall only. (974-5019, <a href="mailto:kgross@utk.edu">kgross@utk.edu</a>)</td>
</tr>
<tr>
<td>Theatre*</td>
<td>MFA</td>
<td></td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>Acting, costume design, lighting design, scene design, theatre technology, Audition required. (974-6011, <a href="mailto:codd@utk.edu">codd@utk.edu</a>)</td>
</tr>
<tr>
<td>College of Business Administration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounting*</td>
<td>MAcc+</td>
<td>GMAT</td>
<td>2</td>
<td>X</td>
<td></td>
<td></td>
<td>Financial auditing, systems, taxation. Evaluate Mar 1. (974-2651, <a href="mailto:rnows@utk.edu">rnows@utk.edu</a>)</td>
</tr>
<tr>
<td>Business Administration*</td>
<td>MBA+</td>
<td>GMAT</td>
<td>2</td>
<td>X</td>
<td></td>
<td>X</td>
<td>MBA-economics, environmental management, finance, forest industries management, global business, logistics &amp; transportation, management, marketing, new venture analysis &amp; entrepreneurship, statistics. PHD-accounting, finance, logistics &amp; transportation, management, marketing, statistics. Admit Fall only. Evaluate Mar 1. Dual JD-MBA, Executive MBA, BA/MBA, M.S.-MBA, Professional MBA programs available. (974-5033, <a href="mailto:jmoser@utk.edu">jmoser@utk.edu</a>)</td>
</tr>
<tr>
<td>MAJOR</td>
<td>DEGREE</td>
<td>GRE</td>
<td>RATING FORM</td>
<td>DEPT. REQ.</td>
<td>THESIS REQ'D.</td>
<td>LANGUAGE REQ'D.</td>
<td>CONCENTRATIONS AVAILABLE/EVALUATION DATES/PHONE (AREA CODE: 423)</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>--------</td>
<td>-----</td>
<td>-------------</td>
<td>-----------</td>
<td>---------------</td>
<td>-----------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>Economics*</td>
<td>MA</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>GMAT may be substituted for GRE. Evaluate Feb 1 for Fall. (974-3303, <a href="mailto:dkeiper@utk.edu">dkeiper@utk.edu</a>)</td>
</tr>
<tr>
<td></td>
<td>PHD</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>Admit Fall only. Evaluate Feb 1. Use forms obtained from department. Degree-seeking students only. (974-4843, <a href="mailto:jjrb@utk.edu">jjrb@utk.edu</a>)</td>
</tr>
<tr>
<td>Industrial &amp; Organizational Psychology*</td>
<td>PHD</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>GMAT may be substituted for GRE. (974-4116, <a href="mailto:request@telestar.bus.utk.edu">request@telestar.bus.utk.edu</a>)</td>
</tr>
<tr>
<td>Management Science*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>Industrial statistics. GMAT may be substituted for GRE. (974-2556, <a href="mailto:mme@utk.edu">mme@utk.edu</a>)</td>
</tr>
<tr>
<td>Statistics*</td>
<td>MS</td>
<td>G</td>
<td>2</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>College of Communications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>MS &amp; PHD-advertising, broadcasting, journalism, public relations, PHD only. Information sciences, speech communication. Admit Fall only. (974-6651, <a href="mailto:bbradley@utk.edu">bbradley@utk.edu</a>)</td>
</tr>
<tr>
<td>College of Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>College Student Personnel</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>Evaluate Mar 15. (974-2216)</td>
</tr>
<tr>
<td>Counseling*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>Community counseling, rehabilitation counseling, school counseling. Evaluate Feb 1 and Nov 1. (974-5131)</td>
</tr>
<tr>
<td>Education I</td>
<td>PHD</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>PHD-adult education, counseling psychology, cultural studies in education, early childhood special education, educational administration and supervision, higher education, elementary education, English/foreign language/ESL education, exercise science, instructional technology/curriculum, literacy studies, reading/language arts, mathematics/science/social science education, rehabilitation/special education, research/assessment/evaluation, school psychology. (974-0907)</td>
</tr>
<tr>
<td>Education II</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>MS Track 1 (those who are already licensed)—art education, curriculum, assessment, instruction, education of the deaf and hard of hearing, elementary education, English education, foreign language/ESL education, instructional technology, mathematics education, modified &amp; comprehensive special education, reading education, science education, social foundations, social science education, special education: early childhood. MS Track 2 (those who are seeking initial license) — art education, education of the deaf &amp; hard of hearing, elementary teaching, modified &amp; comprehensive special education, secondary teaching, special education: early childhood. EDS &amp; EDD-curriculum, assessment &amp; instruction, elementary education, instructional technology, mathematics education, reading education, social foundations, social science education. EDS only—educational administration &amp; supervision, English education, foreign language/ESL education, school counseling, school psychology. EDD only—educational psychology, collaborative learning, English/foreign language/ESL education, leadership for teaching and learning, leadership studies. (974-0907)</td>
</tr>
<tr>
<td>Educational Psychology</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>Adult education, individual &amp; collaborative learning. (974-8145)</td>
</tr>
<tr>
<td>Human Performance &amp; Sport</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>Exercise science, sport management. (974-1272)</td>
</tr>
<tr>
<td>Leadership Studies in Education*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>Educational administration &amp; supervision. Evaluate May 1. (974-2216)</td>
</tr>
<tr>
<td>Aerospace Engineering*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>MS &amp; PHD-aeroacoustics, aerodynamics &amp; performance, energy conversion &amp; utilization, flight &amp; aerospace mechanics, gas dynamics, heat transfer &amp; fluid mechanics, propulsion, space engineering, structures &amp; stress analysis, thermodynamics. (974-5115)</td>
</tr>
<tr>
<td>Chemical Engineering*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>MS &amp; PHD-advanced control systems, chemical bioengineering, chemical engineering, polymer science &amp; engineering. Evaluate Feb 1 for financial aid. Qualified applicants are encouraged to apply directly to the PhD program. PhD applicants receive financial aid preference. (974-2421, <a href="mailto:cheminfo@utk.edu">cheminfo@utk.edu</a>)</td>
</tr>
<tr>
<td>Civil Engineering*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>MS &amp; PHD-construction engineering, environmental engineering, geotechnical/materials engineering, public works engineering, structural engineering, transportation engineering. (974-2503)</td>
</tr>
<tr>
<td>Electrical Engineering*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td>PHD-circuit theory, communication theory, computers, control systems, electronics, electromagnetic theory, plasma engineering, power electronics, power systems, solid-state electronics. (974-3461, <a href="mailto:pli@utk.edu">pli@utk.edu</a>)</td>
</tr>
<tr>
<td>MAJOR</td>
<td>DEGREE</td>
<td>GRE</td>
<td>RATING FORM</td>
<td>DEPT. REQ.*</td>
<td>THESIS REQ'D</td>
<td>LANGUAGE REQ'D</td>
<td>CONCENTRATIONS AVAILABLE/ EVALUATION DATES/PHONE (AREA CODE: 423)</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>--------</td>
<td>-----</td>
<td>-------------</td>
<td>-------------</td>
<td>--------------</td>
<td>----------------</td>
<td>-----------------------------------------------------------------</td>
</tr>
<tr>
<td>Engineering Science</td>
<td>MS</td>
<td>G</td>
<td>G</td>
<td>X</td>
<td>X</td>
<td></td>
<td>MS &amp; PHD-biomedical engineering, computational mechanics, fluid mechanics, industrial engineering, mechanics of composite materials, optical engineering (UTSI only), solid mechanics. (974-8376, <a href="mailto:boulet@utk.edu">boulet@utk.edu</a>) Water quality, water resources, air quality, environmental risk assessment, mixed waste management, waste management. See Civil Engineering for PHD. (974-2503)</td>
</tr>
<tr>
<td></td>
<td>PHD</td>
<td>G</td>
<td>G</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Engineering*</td>
<td>MS</td>
<td>G</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Industrial engineering, engineering management, manufacturing systems. Dual M.S.-MBA program available. See Engineering Sciences for PHD. (974-3333, <a href="mailto:bodie@utk.edu">bodie@utk.edu</a>)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>MS &amp; PHD-dynamics, control &amp; robotics, energy conversion &amp; utilization, gasdynamics, heat transfer &amp; fluid mechanics, machine design, power generation, propulsion, aerospace engineering, stress analysis, thermodynamics. (974-5115)</td>
</tr>
<tr>
<td>Mechanical Engineering*</td>
<td>MS</td>
<td>G</td>
<td>G</td>
<td>X</td>
<td>X</td>
<td></td>
<td>MS &amp; PHD-corrosion behavior, failure analysis, materials processing, mechanical &amp; physical behavior of materials, physical metallurgy, welding metallurgy &amp; materials joining. (974-5336, <a href="mailto:spruiell@utk.edu">spruiell@utk.edu</a>)</td>
</tr>
<tr>
<td></td>
<td>PHD</td>
<td>G</td>
<td>G</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metallurgical Engineering*</td>
<td>MS</td>
<td>G</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td>MS-radiological engineering. (974-2525, <a href="mailto:utne@utk.edu">utne@utk.edu</a>)</td>
</tr>
<tr>
<td></td>
<td>PHD</td>
<td>G</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear Engineering*</td>
<td>MS</td>
<td>G</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>MS &amp; PHD-composite materials; mechanical, physical &amp; chemical behavior of polymers; polymer morphology; rheology &amp; polymer processing. (974-5336, <a href="mailto:spruiell@utk.edu">spruiell@utk.edu</a>)</td>
</tr>
<tr>
<td></td>
<td>PHD</td>
<td>G</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polymer Engineering*</td>
<td>MS</td>
<td>G</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PHD</td>
<td>G</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>College of Human Ecology</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Child development, family studies. Track 2-child development. Evaluate Feb 1, June 1 and Nov 1. (974-4582, <a href="mailto:sbenn@utk.edu">sbenn@utk.edu</a>) Evaluate Feb 1, April 1 and Sept 1. (974-5041)</td>
</tr>
<tr>
<td>Health Promotion &amp; Health Education</td>
<td>MS</td>
<td>G</td>
<td></td>
<td>3</td>
<td>X</td>
<td></td>
<td>Child development, community health, family studies, human resource development, nutrition science, retail &amp; consumer sciences, textile science. Evaluate Feb 1, June 1 and Nov 1. (974-2524, <a href="mailto:moran@utk.edu">moran@utk.edu</a>) Training and development, teacher licensure. Evaluate Feb 1, June 1, and Nov 1. (974-2574, <a href="mailto:hrd@utk.edu">hrd@utk.edu</a>)</td>
</tr>
<tr>
<td>Human Ecology*</td>
<td>PHD</td>
<td>G</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td>Nutrition science, public health nutrition. Evaluate Feb 1, May 1, and Oct 1. Dual MS-MPH program available. (974-5445, <a href="mailto:cyates@utk.edu">cyates@utk.edu</a>) Community health education, gerontology, health planning/ administration. Admit Summer and Fall only. Fall deadline - Apr 1, Summer deadline - Dec 1. Dual MS-MPH program available. (974-6674)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hospitality management, recreation administration therapeutic recreation, tourism. (974-6645, <a href="mailto:smithgb@utk.edu">smithgb@utk.edu</a>) (974-5042)</td>
</tr>
<tr>
<td>Human Resource Development</td>
<td>MS</td>
<td>G</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>Retail and consumer sciences, textile science. Evaluate Mar 1 - Fall and Summer, Nov 1 - Spring. (974-6645, <a href="mailto:smithgb@utk.edu">smithgb@utk.edu</a>)</td>
</tr>
<tr>
<td>Nutrition*</td>
<td>MS</td>
<td>G</td>
<td></td>
<td>3</td>
<td>X</td>
<td></td>
<td>Advocate &amp; dispute resolution, business transactions. Contact College of Law for Bulletin. Dual JD-MBA and JD-MPA programs available. (974-4131)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>College of Law</td>
</tr>
<tr>
<td></td>
<td>MPH</td>
<td>G</td>
<td></td>
<td>3</td>
<td>X</td>
<td></td>
<td>MSN-adult health nursing, family nurse practitioner, mental health nursing, nursing administration, nursing of women and children. Evaluate Oct 1 and Feb 1. (MSN-974-7506, Student Services) (PHD-974-7581, <a href="mailto:sthomas@utk.edu">sthomas@utk.edu</a>)</td>
</tr>
<tr>
<td>Safety Education &amp; Service</td>
<td>MS</td>
<td>G</td>
<td></td>
<td>3</td>
<td>X</td>
<td></td>
<td>College of Nursing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>MSSW-clinical social work practice, management &amp; community practice. Programs offered in Knoxville, Memphs and Nashville. Evaluate Mar 1, (MSSW-974-6697, <a href="mailto:snash@utk.edu">snash@utk.edu</a>) (PHD-974-6481, <a href="mailto:agaadis@utk.edu">agaadis@utk.edu</a>)</td>
</tr>
<tr>
<td>Textiles, Retailing &amp; Consumer Sciences*</td>
<td>MS</td>
<td>G</td>
<td></td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13
<table>
<thead>
<tr>
<th>MAJOR</th>
<th>DEGREE</th>
<th>GRE</th>
<th>RATING FORM</th>
<th>DEPT. REQ.*</th>
<th>THESIS REQ'D.</th>
<th>LANGUAGE REQ'D.*</th>
<th>CONCENTRATIONS AVAILABLE/ EVALUATION DATES/PHONE (AREA CODE: 423)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>College of Veterinary Medicine</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Contact College of Veterinary Medicine for application. (974-7263, <a href="mailto:jbrace@utk.edu">jbrace@utk.edu</a>)</td>
</tr>
<tr>
<td>Veterinary Medicine*</td>
<td>DVM</td>
<td></td>
<td>VCAT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>School of Biomedical Science</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>PHD-biochemistry; biophysics; cellular, developmental &amp; mammalian biology; genetics; radiation biology (974-1227, <a href="mailto:rpopp@utk.edu">rpopp@utk.edu</a>)</td>
</tr>
<tr>
<td>Biomedical Sciences*</td>
<td>PHD</td>
<td>G,S</td>
<td>3</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>School of Information Sciences</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Distance education available in TN and VA. Evaluate July 1, Dec 1 and Apr 1. See College of Communications for PHD. (974-2148, <a href="mailto:hoemann@utk.edu">hoemann@utk.edu</a>)</td>
</tr>
<tr>
<td>Information Sciences*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Intercollegiate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Only offered at UT Space Institute, Tullahoma, Tennessee.</td>
</tr>
<tr>
<td>Aviation Systems*</td>
<td>MS</td>
<td>G</td>
<td>2</td>
<td>X</td>
<td></td>
<td></td>
<td>Evaluate Apr 15 - Summer, Jul 1 - Fall, Nov 15 - Spring. Will accept early applications. (974-6576, <a href="mailto:potgieter@utk.edu">potgieter@utk.edu</a>)</td>
</tr>
<tr>
<td>Comparative &amp; Experimental Medicine*</td>
<td>MS</td>
<td>G</td>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Contact academic program for specific requirements.
* Foreign or computer language.
* International applicants only.
* American applicants only.
* Non-degree students must obtain permission from the department/program head to register for courses in these fields.
* Available for the Academic Common Market to residents of reciprocal states. See Fields of Instruction.

G: GRE General Test.
S: GRE Subject Test.
Admission Requirements

Admission to The Graduate School requires a Bachelor's degree with a satisfactory grade-point average from a college or university accredited by the appropriate regional accrediting agency or foreign equivalent. Application to The Graduate School does not ensure acceptance into a specific degree program nor admission to candidacy for the degree desired. The Graduate School requires a minimum grade-point average of 2.7 out of a possible 4.0, or a 3.0 during the senior year of undergraduate study. Applicants with previous graduate work must have a grade-point average of 3.0 on a 4-point scale or equivalent on all graduate work. Many programs require a higher average. Applicants with work experience or who are entering graduate school after a number of years away from an educational institution usually 5 years, will be given consideration with greater flexibility relative to GPA. An international student graduating from a U.S. institution must meet the same requirements as those for domestic students.

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

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

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

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

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 The Graduate School 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 The Graduate School:

1. The completed Graduate Application for Admission (inside front cover of the Graduate Catalog).
2. A $35 non-refundable application fee.
3. One official transcript from all colleges and universities attended.
4. Additional departmental/program requirements (refer to Majors and Degree Programs chart in front of Graduate Catalog).
   a. Reference letters or test forms. All program forms should be sent to the college or department.
   b. Scores from the Graduate Record Examination (GRE) or Graduate Management Admission Test (GMAT).
   c. Scores from Test of English as a Foreign Language (TOEFL) if native language is not English (refer to section on English Proficiency).
5. Application forms for the above tests can be obtained by writing:
   Educational Testing Service
   Princeton, NJ 08540
   UT Knoxville is an approved testing center for all examinations. Examination results reach the University in approximately six weeks.

6. All of the above documents 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

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

DEGREE ADMISSION

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

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

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

A major area must be declared if the intent is to seek an advanced degree. If no degree is desired, a major area need not be declared, but some departments do not permit non-degree students to register for graduate courses (see Majors and Degree Programs chart for information on restricted programs).

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

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

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 Associate Dean of The Graduate School, or designee, is the advisor.

A student must maintain a 3.0 grade-point average to continue enrollment in non-degree status (see Academic Standards). Admission to non-degree status does not assure 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.

TRANSIENT ADMISSION

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

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

a. 14 on a 20-point scale.

b. 80.0 from Taiwanese institutions.

c. 1st Class or Division from Indian institutions.

d. Upper 2nd Class Honors on various British systems.

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

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

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

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

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

1. A completed Graduate Application for Admission.

2. A $35 non-refundable processing fee. Payment should be made in United States dollars by a cashier’s check, money order, or personal check. If payment is by personal check, it must be drawn on a United States bank to be honored in United States currency. Checks drawn on overseas banks are not accepted. International money orders are suggested.

3. Official or attested university records, with certified translations if the records are not in English (Notarized copies are not accepted).


5. Documented evidence of financial resources sufficient to support the student, as stated on the financial statement form supplied to the applicant. This form is sent to the applicant after receipt of application.

6. Additional department/program requirements (refer to Majors and Degree Programs chart in front of Graduate Catalog).

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

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

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

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

The University will not enroll any student who has not been approved initially, or for transfer, by the Immigration and Naturalization Services (INS) to attend UT Knoxville. 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 550 is required for admission consideration. Some departments require higher scores. The score must be no more than two years old. 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 UTK. Refer to section on English Proficiency.

Admission of Faculty and Staff Members

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

Faculty members of UT Knoxville or the Institute of Agriculture at the rank of assistant professor or above, and members of the administrative staff at UT Knoxville, the UT Central Administration, and the Institute of Agriculture will not normally be admitted to an Ed.D. or Ph.D. degree program at UT Knoxville. Exceptions may be granted on an individual basis upon petition to The Graduate School. Petitioners must present their request in writing, providing adequate assurance that the academic and administrative interest. Written endorsements must be provided by the respective deans and department heads of the units in which members are employed and in which the doctoral degrees are to be pursued. Requests should be directed to the Associate Vice Chancellor and Dean of The Graduate School.

Revision of Admission Classification

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

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

Registration and Enrollment Requirements

Graduate Credit

To earn graduate credit, a student must be admitted by the Dean of The Graduate School and enrolled in an appropriate status as a graduate student. The registration must reflect the desire for graduate credit, and the course must have been approved by the Graduate Council. Coursework taken in any other status is unacceptable for graduate credit and cannot be changed retroactively to graduate credit. Special privileges are accorded UT Knoxville 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 different from undergraduate curricula, classes at the 400-level in which both graduate and undergraduate students are enrolled must be structured so as to make this distinction. That is, course requirements for graduate credit will be more rigorous and thus will exceed expectations for undergraduates.

Graduate and undergraduate completion of the same course will not be considered equivalent, and therefore petitions for retroactive changing of undergraduate to graduate credit will not be accepted.

Courses at the 600 level are taught by faculty who have been approved by the
for the 600 level are available from The Graduate School.

**Undergraduate and Professional Students**

**UT KNOXVILLE SENIORS**

Subject to approval by The Graduate School, a senior at UT Knoxville 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. Approval must be obtained each semester at the Office of Graduate Admissions and Records during registration. A maximum of 15 hours of graduate credit 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 KNOXVILLE VETERINARY MEDICINE STUDENTS**

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

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

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

**UT KNOXVILLE LAW STUDENTS**

Subject to approval by The Graduate School and the College of Law, a law student at UT Knoxville may enroll in graduate courses for graduate credit. Approval must be obtained each semester at the Office of Graduate Admissions and Records during registration. Courses taken for graduate credit may not be used toward both the J.D. degree and a graduate degree. Use of such courses toward the J.D. degree are subject to guidelines approved by the law faculty.

**Law Courses**

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

Different rules apply to students enrolled in the Dual J.D.-MBA and J.D.-MPA programs. Grades must be earned according to the grading system of the respective colleges, e.g., numerical grades for law courses, letter grades for graduate courses. Refer to sections on Business Administration, Political Science, and Law under Fields of Instruction for grades acceptable to meet degree requirements. A student enrolled in the Ph.D. in Business Administration program may use 8 semester hours of law courses for the supporting area via the arrangement described under Business Administration.

**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 either of these conditions is required for enrollment. Students 65 or over, or who are totally disabled, and who desire to receive UT credit for their courses, may pay a reduced charge of $7 per credit hour up to a maximum of $75 for a full-time load. Registration for day and evening classes is handled by the Evening School, 451 Communications and University Extension Building, (423) 574-5361 or 1-800-676-8657.

**Auditors and Audited Courses**

Persons who wish to attend certain classes regularly, without taking examinations or receiving grades, may do so by completing a graduate application, 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 roll, 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.

**Short Courses and Workshops**

The University offers a wide variety of short courses and workshops 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 Knoxville for work done by correspondence study at any university.

**Proficiency Examinations**

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

**English Proficiency**

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

Applicants whose native language is not English must pass an oral test in English (the SPEAK Test) before they can be assigned to classroom duties in connection with their assistantships. The SPEAK Test is administered on campus by The Graduate School. Scores from the Test of Spoken English (TSE) may be accepted in place of the SPEAK Test.

Prerequisites

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

Advisor/Major Professor

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

Departmental Liaison

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

Registration

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

Information concerning registration is available in the Graduate School News and Timetable of Classes each term. Registration is accomplished via telephone. During priority registration, a schedule and bill is mailed to the registrant. Payment is due by the deadline noted on the bill. A graduated late fee is assessed to any student who fails to register during priority registration. Additional information can be obtained from Computer Assisted Registration Services Office, (423) 974-2223.

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 Admissions and Records. Non-degree students with no declared major must obtain permission from the department/unit to register for courses in restricted fields.

Conditional Registration

Applicants who appear to meet the admission requirements of The Graduate School may be allowed to register for an initial term after submitting the Graduate Application for Admission form and application fee. Time is allowed to obtain transcripts and additional requirements for admission. Students who fail to gain admission within seven weeks after admission 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 must be registered. Normally, students are registered for coursework or thesis/dissertation credit. Non-thesis students or those who have not begun research, but who have completed all coursework requirements, must register for course 502.

Course Description

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

The official course title appears following the course number. Numbers in parentheses following the course number indicate the semester and 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. Recommended prerequisites should be taken previously but are not mandatory.

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/N only" indicates that the course may be taken only for Satisfactory/No Credit grading. Refer to section on Grades.

A symbol indicating the semester or frequency that the course is normally offered is included at the end of many course descriptions:

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

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

Change of Registration

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

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

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

The deadline for all other changes of registration (e.g. from graduate to undergraduate, undergraduate to graduate, withdrawal) is approximately 42 calendar days after the first day of classes each semester.

(See Graduate Catalog, News or Timetable of Classes each term for exact dates.) A student may change registration for a course at any time prior to and including this date by accessing the telephone registration system. The student must confirm that the advisor has granted approval of the change. If additional permission is necessary, a student must execute a change of registration, if person, at the Registration Services Office. The advisor's signature is required to add a course, if the course is closed and/or after the
first 29 calendar days of classes. The student must sign the form certifying approval of the advisor.

If the student withdraws from a course, or from the University, after the first 29 calendar days of classes and before the change of registration deadline, a grade of W will be entered on the permanent record.

After the change of registration deadline, a student withdrawing from a course or from the University will receive a grade of F unless it can be demonstrated that the request for withdrawal is based on circumstances beyond the student's control. In the latter case, a grade of W will be entered on the permanent record.

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

Course Loads

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

Students holding a one-half time assistantship normally should enroll for 6-11 semester hours. A one-fourth time graduate assistant normally should take 9-13 semester hours. A student on a one-half time assistantship who takes six semester hours will be considered full time. Refer to the Policy for the Administration of Graduate Assistantships for additional information.

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

Registration for more than 15 hours during any semester, or for more than 12 hours in the summer term, is not permissible without prior approval of The Graduate School, which may allow registration of up to 18 hours during 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 Knoxville to remain in good standing and to receive any graduate degree from the University. All coursework taken for graduate credit is computed into the GPA.

Grades in The Graduate School have the following meanings:

- **A** (4 quality points per semester hour), superior performance.
- **B+** (3.5 quality points per semester hour), better than satisfactory performance.
- **B** (3 quality points per semester hour), satisfactory performance.
- **C** (2.5 quality points per semester hour), below 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.
- **I** (no quality points), a temporary grade indicating that the student has performed satisfactorily in the course but, due to unforeseen circumstances, has been unable to finish all requirements. An I is NOT given to enable a student to do additional work to raise a deficient grade. All incompletes must be removed within one semester, excluding the summer term. If a supplementary grade report has not been received in the Office of Graduate Admissions and Records at the end of the semester, the I will be changed to an F. The course will not be counted in the cumulative grade-point average until a final grade is assigned. No student may graduate with an I on the record.

Courses where NC is received may be repeated for a grade of S. A grade of S/NC is allowed only where indicated in the course description in the Graduate Catalog. The number of S/NC courses in a student's program is limited to four. The student may earn a grade of S or NC in any course.

Students who withdraw from a course after the second day of classes will receive a grade of W unless the instructor assigns a grade of F. The course will not be counted in the cumulative grade-point average until a final grade is assigned. NC means no credit earned. This grade is assigned for failure to attend class and/or adhere to the course rules.

No student may graduate with an I on the record. No student may graduate with an I on the record.

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

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 Graduate School if the student's semester GPA falls below 3.0 in a subsequent semester. When the particular circumstances may be deemed to justify continuation, and upon recommendation of the appropriate academic unit and approval of The Graduate School, 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 The Graduate School. In those cases where the department's requirements for continuation are more stringent than Graduate School requirements, The Graduate School 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
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 School News each semester for specific deadlines. Departmental 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.

Handbook

The following are the Graduate School'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 Knoxville. The major specifies the minimal 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.


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

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

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

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

Minors

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

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

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

Transfer Credits

Courses taken at another institution may be considered for transfer into a master's or Ed.S. program as determined by the committee. Credits transferred from universities outside The University of Tennessee system cannot be used to meet the 500- or 600-level coursework requirements. Credit for extension courses taken from other institutions is not transferrable, nor is credit for any course taken at an unaccredited and/or foreign institution.

MASTER'S DEGREE

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

ED.S. DEGREE

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

DOCTORAL DEGREE

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

Theses and Dissertations

All theses and dissertations are submitted to The Graduate School Thesis/Dissertation Consultant for examination. The Consultant will
review the material and assure that it is attractively presented, free of technical errors in format, suitable for binding, and reflects credit upon the University and The Graduate School. If the thesis or dissertation is not accepted, the student must make corrections and resubmit the material.

The student, major professor and committee share responsibility for the accuracy and professionalism of the final product of the student's research. The student should confer with the Thesis/Dissertation Consultant regarding problems and questions in advance of preparing the final copy. The UT Knoxville Guide to the Preparation of Theses and Dissertations (8th ed.) provides the correct format for theses or dissertations. Workshops are held periodically throughout the academic year. The date for each workshop is announced in the Graduate School News.

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

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

### 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 major 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 in the major (and 8-12 in some approved programs) must be earned in 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-credit program, the major subject must include at least 12 hours of graduate coursework, exclusive of course 500, and a minor must include no fewer than 6, nor more than 12, hours of graduate credit.

At least two-thirds of the minimally 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 applicable. 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 of whom are in the major department, or above, should be formed as early as possible in a student's program, and must be formed by the time the student applies for admission to candidacy (refer to Advisor/Major Professor). The responsibility of this committee is to assist the student in planning a program of study and carrying out research, and to assure fulfillment of the degree requirements. If the student has a minor, one member of the committee must be from the minor department.

### ADMISSION TO CANDIDACY

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

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

### THESIS REGISTRATION

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

### THESIS

The thesis represents the culmination of an original research project completed by the student. It must be prepared according to the UT Knoxville Guide to the Preparation of Theses and Dissertations (8th ed.). Two copies of the thesis must be approved and accepted by The Graduate School on or before the deadline specified each semester in the Graduate School News. Each copy must include an approval sheet, signed by the members of the master's committee, certifying that there is no exception to the final copy of the thesis and that the committee has judged it to be satisfactory.

### FINAL EXAMINATION FOR THESIS AND PROBLEMS IN LIEU OF THESIS

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

### FINAL EXAMINATION FOR NON-THESIS STUDENTS

Each non-thesis student must pass a final comprehensive written examination. A department may require an additional oral examination. The examination is not merely a test over coursework, but a measure of the student's ability to integrate material in the major and related fields. Except with prior approval from The Graduate School, the examination must be given in University-approved facilities. It must be scheduled through the Office of Graduate Admissions and Records in accordance with the deadlines specified in the Graduate School News and will be conducted by the master's committee. Final examinations not properly scheduled must be repeated. Students taking the final examination but not otherwise using University facilities may pay a fee of $150 instead of registering. In case of failure, the candidate may not apply for reexamination until the following semester. The result of the second examination is final.
TIME LIMIT

Candidates have six calendar years from the time of enrollment in The Graduate School to complete the degree. Students who change degree programs during this six-year period may be granted an extension after review and approval by The Graduate School. In any event, courses used toward a master's degree must have been taken within six calendar years of graduation.

Specialist in Education Degree

The Specialist in Education (Ed.S.) degree is offered with a major in Education. Admission to the Ed.S. program requires acceptance by the graduate committee 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 the 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 examinations will be permitted in examination and research requirements, nor in the minimum 6 graduate hours required outside the major. All prior coursework accepted toward the degree must be related to the student's program objectives. A maximum of 6 hours beyond the master's degree may be transferred from another institution to an Ed.S. program (refer to section on Transfer Credits). Courses numbered at the 400 level required for certification through UT Knoxville may not be taken for graduate credit and used as coursework in the major. At least one-half of the last 30 semester hours of work, exclusive of thesis courses, must be in 500- or 600-level courses.

ED.S.COMMITTEE

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

RESIDENCE REQUIREMENTS

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

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

ADMISSION TO CANDIDACY

Admission to candidacy reflects agreement among the student, graduate committee, and The Graduate School that the student has demonstrated ability to do acceptable graduate work and that normal 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 Graduate Admissions and Records before the student has completed 15 hours of coursework in the Ed.S. program. A qualifying examination may be required for admission to candidacy if the student has a master's degree earned six years or more prior to admission to the program. This examination may be written and/or oral.

RESEARCH REQUIREMENTS

See the program descriptions of individual units for listings of thesis, problems in lieu of thesis, and non-thesis options. Some units offer only a thesis program.
1. In the non-thesis program, a candidate will study research methods and findings and will demonstrate skill in adapting them to professional needs as defined by the major department.
2. In the thesis program, or problems in lieu of thesis, 6 hours of research credit (518 or 503) must be earned in preparation of an acceptable piece of work. The student must continue to register for thesis or problems while working on the project, including the semester it is accepted for The Graduate School. The thesis must be prepared according to Instructions in the UT Knoxville Guide to the Preparation of Theses and Dissertations (5th ed.), and approved by the student's committee prior to submission to The Graduate School for final approval and acceptance.

FINAL EXAMINATION

A candidate presenting a thesis, or problems in lieu of thesis, must pass an oral examination covering the student's research and program of study. A non-thesis student must pass a final written, 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 must be scheduled through the Office of Graduate Admissions and Records before the deadline and will be conducted in University-approved facilities by the student's committee. Final examinations not properly scheduled must be repeated. In case of failure, the candidate may not be reexamined until the following semester. The result of the second examination is final.

TIME LIMIT

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

Doctoral Degrees

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

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

PROGRAM OF STUDY

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

A candidate for a doctoral degree must complete a minimum of 24 hours of graduate coursework beyond the master's degree, which is a prerequisite for entry into most doctoral programs. If the doctoral program does not require a master's degree, the candidate must complete a minimum of 48 hours of graduate coursework beyond the baccalaureate degree. A minimum of 12 of the last 24 hours, or 30 of the last 60 hours, must be graded A-F. A minimum of 6 semester hours of the student's coursework must be taken in UT Knoxville courses at the 600 level, exclusive of dissertation.

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

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

DOCTORAL COMMITTEE

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

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

DOCTORAL EXAMINATIONS

Departments may, at their option, administer diagnostic and/or qualifying examinations in the early stages of the student's doctoral program. Successful completion of a comprehensive examination and a defense of dissertation is required for all doctoral degrees. Registration is required in the term in which examinations are taken.

Diag nostic Examination

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

Qualifying Examination

A student on admission to a doctoral program may be given a written and/or oral qualifying examination, 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 examinations 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 Graduate Admissions and Records Office at least one week prior to the examination and must be conducted in University-approved facilities. Final examinations not properly scheduled must be repeated. The examination is announced publicly and is open to all faculty members. The defense of dissertation will be administered by all members of the doctoral committee after completion of the dissertation and all course requirements. This examination must be passed at least two weeks before the date of submission and acceptance of the dissertation by The Graduate School. The major professor must submit the results of the defense by the dissertation deadline.

LANGUAGE REQUIREMENTS

Candidates for the Ph.D. degree must 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 Language Examination at the Office of Graduate Admissions and Records in accordance with the dates and times for the examinations printed in the Graduate School News. Satisfactory completion (grade of B or better) of German 332 or French 302 may be substituted for a language examination.

Some programs may accept a computer language in lieu of a foreign language.

RESIDENCE REQUIREMENTS

Residence is defined as full-time registration for a given semester on the campus where 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 in the Graduate School.

ADMISSION TO CANDIDACY

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

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

CONTINUOUS REGISTRATION

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

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

DISSERTATION

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

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

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

TIME LIMIT

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

### PROCEDURES

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Under Direction Of</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission as a potential degree candidate</td>
<td>Office of Graduate Admissions and Records and Major Department</td>
<td>Prior to completing 15 hours of graduate courses</td>
</tr>
<tr>
<td>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</td>
<td>At least one semester prior to graduation*</td>
</tr>
<tr>
<td>Approval of admission to candidacy</td>
<td>The Graduate School</td>
<td>Prior to graduation</td>
</tr>
</tbody>
</table>

### GRADUATION REQUIREMENTS FOR NON-THESIS OPTION

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Under Direction Of</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submission of application for diploma</td>
<td>Office of Graduate Admissions and Records</td>
<td>At beginning of term of graduation*</td>
</tr>
<tr>
<td>Payment of graduation fee</td>
<td>Bursar's Office</td>
<td>At beginning of term of graduation*</td>
</tr>
<tr>
<td>Scheduling of Final Examination</td>
<td>Student, Committee and Office of Graduate Admissions and Records</td>
<td>Not later than one week 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 one week prior to Commencement*</td>
</tr>
</tbody>
</table>

### GRADUATION REQUIREMENTS FOR THESIS/PROBLEMS OPTIONS

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Under Direction Of</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submission of application for diploma</td>
<td>Office of Graduate Admissions and Records</td>
<td>At beginning of term of graduation*</td>
</tr>
<tr>
<td>Payment of graduation fee</td>
<td>Bursar's Office</td>
<td>At beginning of term of graduation*</td>
</tr>
<tr>
<td>Submission of 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, Committee and Office of Graduate Admissions and Records</td>
<td>Not later than one week 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 The Graduate School</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 one week prior to Commencement*</td>
</tr>
</tbody>
</table>

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

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

## GRADUATION REQUIREMENTS

<table>
<thead>
<tr>
<th>Under direction of</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submission of application for diploma</td>
<td>Office of Graduate Admissions and Records</td>
</tr>
<tr>
<td>Payment of graduation fee</td>
<td>Bursar's Office</td>
</tr>
<tr>
<td>Submission of dissertation to doctoral committee</td>
<td>Student</td>
</tr>
<tr>
<td>Scheduling of Defense of Dissertation Examination</td>
<td>Student, Committee and Office of Graduate Admissions and Records</td>
</tr>
<tr>
<td>Defense of Dissertation Examination</td>
<td>Doctoral Committee</td>
</tr>
<tr>
<td>Approval and acceptance of final copy of dissertation and doctoral forms</td>
<td>Doctoral Committee and The Graduate School</td>
</tr>
<tr>
<td>Removal of Incomplete(s)</td>
<td>Instructor of Course</td>
</tr>
</tbody>
</table>

*The order of these items varies with individual programs.

**Not required in some programs.

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

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

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

A student not wishing to appeal a classification should contact the Admissions Specialist, who will provide an application for reclassification and a copy of the State regulations. The application must be submitted on or before the last day of regular registration (the day before classes officially begin) for a given semester, if the student is to be considered for reclassification that semester.

RULES OF RESIDENCY CLASSIFICATION

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

Definitions
(1) "Public higher educational institution" shall mean a university or community college supported by appropriations made by the Legislature of this State.
(2) "Residence" shall mean continuous physical presence and maintenance of a dwelling within this State, provided that absence from the State for short periods of time shall not affect the establishment of a residence.
(3) "Domicile" shall mean a person’s true, fixed, and permanent home and place of habitation; it is the place where he intends to remain, and to which he or she expects to return when he or she leaves without intending to establish a new domicile elsewhere.
(4) "Emancipated person" shall mean a person who is no longer in the care, custody, and control of an overseer or his parent.
(5) "Parent" shall mean a person’s father or mother. If there is no non-parental guardian or legal custodian of an emancipated person, then "parent" shall mean such guardian or legal custodian; provided, that there are no circumstances indicating that such guardian-ship or custodianship was created primarily for the purpose of conferring the status of an in-state student on such emancipated person.
(6) "Continuous enrollment" shall mean enrollment at a public higher educational institution or institutions of this State as a full-time student, as such term is defined by the governing body of such public higher educational institution or institutions, for a normal academic year or years or the appropriate portion or portions thereof since the beginning of the period for which continuous enrollment is claimed.

Out-of-State Students Who Are Not Required to Pay Out-of-State Tuition
(1) An unemancipated, currently enrolled student shall be reclassified out-of-state should the parent or legal custodian of such a student, having theretofore been domiciled in the State, remove from the State. However, such student shall not be required to pay out-of-state tuition nor be treated as an out-of-state student for admission purposes so long as his or her enrollment at a public higher educational institution or institutions is continuous.
(2) An emancipated person whose parent is not domiciled in this State but is a member of the armed forces stationed in this State or at Fort Campbell pursuant to military orders shall be classified out-of-state, but shall not be required to pay out-of-state tuition. Such a person, while in continuous attendance toward the degree for which he or she is currently enrolled, shall not be required to pay out-of-state tuition if his or her parent thereafter is transferred on military orders. Provided, however, that there be no teacher college or normal school within the non-resident’s own state, of equal distance to said non-resident’s bona fide place of residence.
(3) A person whose domicile is in a county which is adjacent to Montgomery County, or whose place of residence is within thirty (30) miles of Austin Peay State University shall be classified out-of-state but shall not be required to pay out-of-state tuition at Austin Peay State University. Provided, however, that there be no teacher college or normal school within the non-resident’s own state, of equal distance to said non-resident’s bona fide place of residence.
(4) Part-time students who are not domiciled in this State but who are employed full-time in the State, or who are stationed at Fort Campbell pursuant to military orders, shall be classified out-of-state but shall not be required to pay out-of-state tuition. This shall apply to part-time students who are employed in the State by more than one employer, resulting in the equivalent of full-time employment.
(5) Military personnel and their spouses stationed in the State of Tennessee who would be classified out-of-state in accordance with other provisions of these regulations will be classified in-state but shall not be required to pay out-of-state tuition.
(6) A student who is domiciled in the Kentucky counties of Fulton, Hickman, or Graves shall be classified out-of-state and shall not be required to pay out-of-state tuition at The University of Tennessee at Martin if qualified for admission. This exemption is on condition that the student will remain in Tennessee to enroll at that institution without payment of out-of-state tuition.
(7) Any dependent child not domiciled in Tennessee but who qualifies and is selected to receive a scholarship under the Dependents Children Scholarship Act (T.C.A. 48-4-704) because his or her parent is a law enforcement officer, firefighter, or emergency medical service technician who was killed or totally and permanently disabled while performing duties within the scope of employment, shall be classified out-of-state but shall not be required to pay out-of-state tuition.
(8) The spouse of a student classified as "in-state" shall also be classified "in-state.
(9) Students not domiciled in Tennessee but who are selected to participate in specified institutional undergraduate honors programs shall be classified out-of-state but shall not be required to pay out-of-state tuition. Provided, however, that there be no teacher college or normal school within the non-resident’s own state, of equal distance to said non-resident’s bona fide place of residence.
(10) A student whose domicile is in Mississippi County, Arkansas, or either Duntin County or Perry County, Missouri, and who is admitted to Dyersburg State Community College, shall be classified out-of-state but shall not be required to pay out-of-state tuition.
(11) A person who is not domiciled in Tennessee, but has a bona fide place of residence in a county which is adjacent to the Tennessee state line and which is also within a 30 mile radius (as determined by the THEC) of a city containing a two-year TBR institution and who is admitted to a two-year TBR institution, shall be classified out-of-state but shall not be required to pay out-of-state tuition. Provided, however, that there be no teacher college or normal school within the non-resident’s own state, of equal distance to said non-resident’s bona fide place of residence.

Presumption
Unless the contrary appears from clear and convincing evidence, it shall be presumed that an emancipated person does not acquire domicile in this State while enrolled as a full-time student at any public or private higher educational institution in this State, as such status is defined by such institution.

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

Appeal

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

Effective Date for Reclassification

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

University Fees

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

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

All students must confirm their attendance by 1) making the minimum payment, or 2) signing the Confirmation of Attendance Form if no fees are due by the student. The schedule signifying the date fees will be charged for any quarter or semester during which reclassification is sought and obtained unless application for reclassification is made to the classification officer on or before the last day of regular registration of that quarter or semester.

APPLICATION FEE

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

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

VOLXPRESS

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

VOLXPRESS is a convenient method for students to take care of business from home. Students who register and pay early will receive the greatest benefit if the payment deadlines are observed. Each student must submit any change of billing address to the Enrollment Data Services Office to ensure timely receipt of a VOLXPRESS statement. Each Timetable of Classes lists the dates of registration and when and if statements will be mailed.

IN-STATE FEES

Fall 1997

MAINTENANCE FEE

Per Semester $1,331

Part Time (8 hours or less) $150 per credit (or audit) hour or fraction thereof; minimum charge $150.

OUT-OF-STATE FEES

Fall 1997

MAINTENANCE FEE AND TUITION

Per Semester $3,672

Part Time (8 hours or less) $408 per credit (or audit) hour or fraction thereof; minimum charge $408.

MUSIC FEE

One hour lesson per week

$120

$60

$120

There are no additional charges for diploma, binding, or microfilming. The graduation fee is

GRADUATION FEE

Master’s degree candidates $30

Doctoral degree candidates $75

Doctoral hood rental (optional) $5

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

Effective Date for Reclassification

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

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

UNIVERSITY PROGRAMS AND SERVICES FEE

Full Time (8 hours or more) $140

Per Semester $84

Part Time (8 hours or less) per credit (or audit hour)

Per Semester $9

Per Summer Term $6

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

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

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.

Knoxville campus students taking 5-3 hours may elect to pay the student health fee ($42 for fall and spring, $33 for summer) plus the appropriate part-time programs and services fee up to the maximum of $140.

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

MUSIC FEE

One-half hour lesson per week

One-hour lesson per week

Payable by students receiving individual instruction in music.

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

GRADUATION FEE

$30

$75

$5

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

PROFICIENCY FEES

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

FEES FOR COURSES NOT TAKEN FOR CREDIT

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

DEFERRED PAYMENT PLAN SERVICE FEE .............................................................. $10

(See Tuition Payment Plans)

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

PRIORITY REGISTRATION

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

FINAL REGISTRATION LATE FEE

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

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

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

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

RESTATEMENT FEE .............................................................. $45

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

RETURNED CHECK SERVICE FEE POLICY

All checks are deposited the day they are received. A $20 service charge will be assessed when checks fail to clear the bank on which they are drawn. Returned checks will not be reprocessed. Cash or certified funds are required for payment of the returned check and service charges.

Any student who does not respond within 2 weeks from the date of the first notice may be assessed an additional $10 Service Charge. Failure to clear returned checks will result in the forfeiture of all university services, including the receipt of grades, transcripts, and schedule of classes. Check cashing privileges may be suspended or terminated in accordance with University policy. Failure to pay may also result in additional late fees, collection costs and reasonable attorney fees.

TUITION PAYMENT PLANS

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

Deferred Payment Plan

Students in good financial standing will be offered a deferral of up to 50% of the total charges on their VOLXpress statement. The deferred payment may be divided into two equal installments payable on approximately the 26th and 56th day of the term. All financial aid must be applied toward fees before a deferral will be considered. A deferred payment service fee of $10 is assessed when any portion of tuition, fees, and other charges are deferred with the approval of the Bursar's Office. An additional $25 late payment charge will be assessed on each monthly 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. Additional $45 reinstatement fee will be assessed if fees are not paid by one month prior to the end of the term.

Room and Board Plan

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

REFUNDS

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

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 Graduate Admissions and Records Office, 218 Student Services Building. Failure to attend class does not permit a student to withdraw or drop a student from the University class. The effective date of withdrawal is the date the Office of Graduate Admissions and Records is notified by completion of the official withdrawal request form. The appropriate percentage of fees (maintenance and tuition and technology fees only) will be charged unless this action is completed by the close of the fall before the first official day of classes for the semester. Failure to notify the Graduate Admissions and Records Office promptly when withdrawing could result in a larger fee assessment. Withdrawals for non-technical fees and charges already incurred. All charges and refunds will be made to the nearest even dollar.

The drop/add procedure cannot be used to withdraw from school for the semester.

For a regular academic semester, withdrawal within 5 business days beginning with the first official class start date of the semester permits a 90% refund/10% charge. Specific dates will be printed in the Timetable of Classes. The first class start date is the date on which all classes begin. Withdrawal between 6 and 10 business days beginning with the first class start date of the semester permits an 80% refund/20% charge. Withdrawal between 11 and 15 business days permits a 60% refund/40% charge. Withdrawal between 16 and 20 business days permits a 40% refund/60% charge. A 100% charge is assessed for courses dropped after 20 business days. Refunds, in accordance with the withdrawal refund policy, will be made after the drop deadline.

Financial Aid Withdrawals/Repayments

Repayments are defined as the portion of aid, received by a student after the University direct charges have been paid by that aid, that must be repaid when a student withdraws or is dismissed. The amount of repayment is determined by the Refund/Charge stated previously.

Refunds and repayments to the Title IV programs are determined according to the formula published in the current "Federal Student Financial Aid Handbook." The Financial Aid Office is responsible for calculating the amount of the refund and/or repayment and distributing the correct amount to the financial aid programs according to the Refund/Repayment Allocation Policy.

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

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

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

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

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

**SUMMERTERM FEES AND EXPENSES**

Fees and expenses for the summer semester are the same as for other semesters during the academic year, except for University Programs and Services Fees as previously mentioned. Although the summer term is divided into sessions of varying lengths, tuition and fees are assessed at the regular semester-hour rate up to the maximum charge for a complete regular semester.

The refund policy covering withdrawal and dropped courses for the summer semester is based on the length of the term for the course(s) dropped. Percentages of refunds is based on the date of withdrawal/drop; see Timetable of Classes for specific dates.

**WAIVER OF FEES**

Graduate assistants, teaching assistants and associated research assistants, staff, and others whose fees are billed, prepaid, waived, or partially waived confirm their attendance by making payment or signing a Confirmation of Attendance Form by the due date as published in the Timetable of Classes or the schedule will be cancelled. If an appointment terminates during the term, the student owes the appropriate fees from the termination date until the end of the term.

Graduate students are not eligible for UT spouse/dependent discounts.

**STUDENT HEALTH INSURANCE**

The University makes available, by contract with an insurance company, group health insurance expressly for students. The program is designed to supplement the care provided by the campus Student Health Service and provide basic benefits at low group premium rates. Primary emphasis is placed on hospitalization benefits, since in-patient care is not provided on campus. Students not otherwise covered are urged to avail themselves of this or comparable insurance, since paying for hospital care is the student's responsibility. Information about the insurance is mailed by the company to the student's home, and participation is solicited. Enrollment in the plan (or alternative coverage) is mandatory for international students. Students may obtain applications from the Student Health Service or the Center for International Education. Except for international students, enrollment for insurance is not part of registration for classes. NOTE: The family health insurance policy should be carefully reviewed, since most family policies do not cover a dependent child after a given age, some as early as nineteen.

**IDENTIFICATION CARD**

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

These cards are non-transferable and may not be duplicated. The VolCard MUST BE CARRIED AT ALL TIMES FOR PURPOSES OF IDENTIFICATION. Students are responsible for the safekeeping of this card and must immediately report it lost or stolen if the card is not in their possession.

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

**FEES FOR SPONSORED INTERNATIONAL STUDENTS**

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

**Financial Assistance**

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

**ASSISTANTSHIPS**

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

**FELLOWSHIPS**

The Graduate School administers the Hilton A. Smith Graduate Fellowships, the Herman E. Spivey Graduate Fellowships and The Graduate School Fellowships. These awards are for full-time study at UT Knoxville, 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 and The Graduate School awards if they have a 3.7 grade-point average or above in all previous academic work. Candidates for graduate study in the humanities are invited to apply for the Herman E. Spivey fellowships if they have a 3.7 grade-point average or above in all previous academic work. The Hilton A. Smith and the Herman E. Spivey fellowships include monthly stipends, tuition, and maintenance fees. The Graduate School Fellowships include a stipend presented at the beginning of each semester (Fall and Spring). Application packets are available from November through January in the Office of Graduate Admissions and Records. Completed applications, including all supporting materials, must be submitted by February 15. Offers of awards are announced March 15.

**ACADEMIC COMMON MARKET**

The Academic Common Market is an agreement among Southern states for sharing unique programs. Participating states can make arrangements for their students who are fully admitted to specific programs at UT Knoxville 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. Eighteen doctoral and twenty-eight master's programs at UT Knoxville are approved by the Academic Common Market for residents of these states to enroll at in-state tuition rates.

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

Residents of member states who seek further information should contact the Admissions Specialist in the Office of Graduate Admissions and Records, 974-3251, or the Southern Regional Educational Board, 592 Tenth Street, N.W., Atlanta, Ga. 30319-5790, tel. (404) 875-9211, FAX (404) 872-1477.

**EMPLOYMENT**

The Financial Aid Office 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.
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 Knoxville without the consent of the individual. Release of information to third parties includes directory information such as contained in the campus telephone book and sports brochures. Such information may include name, address, telephone number, date and place of birth, major, dates of attendance, degrees and awards, the most recent previous educational agency or institution attended, participation in school activities and sports, and weight and height (for special activities).

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

**Use of Social Security Number**

UT Knoxville 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 provide their student identification number. Student identification numbers, whether social security or assigned numbers, are used administratively only and are not given to third parties without expressed consent of the student.

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

**VETERANS BENEFITS**

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

**EEO/Title IX/Section 504 Statement**

The University of Tennessee, Knoxville, does not discriminate on the basis of race, sex, color, religion, national origin, age, disability, or veteran status in provision of educational opportunities or employment opportunities and benefits.

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

Inquiries concerning Title VI, Title IX, Section 504, and the ADA should be directed to the Office of Diversity Resources and Educational Services (520-6666) or to the University of Tennessee, Knoxville, Knoxville, TN 37996-3650, or telephone (423) 974-2498 (V/TTY). Charges of violation of the above policy should also be directed to DRES.

**Security Information**

In accordance with the Tennessee College and University Security Information Act of 1989 and the Student Employee Right to Know and Campus Security Act, The University of Tennessee Knoxville 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 1989.

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.

Violations of this policy are grounds for disciplinary action--up to and including immediate discharge as 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 (888) 436-8939. 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 alcoholic
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 total of responsibility may be greater than that required of other students or staff members, but the opportunities for professional development also are greater for the graduate assistant.

TENNESSEE CONFERENCE OF GRADUATE SCHOOLS

DEFINITION

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

WAIIVERS AND TUITION FEES

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, Knoxville.

TYPES OF ASSISTANTSHIPS

It is imperative that each department adhere to the UTK 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.

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 Assistant

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

Graduate Research Assistant

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

ASSISTANTS

QUALIFICATIONS OF GRADUATE

Graduate assistants must be currently enrolled in the Graduate School (as fully-admitted degree-seeking students, provisional students, non-degree students, or transient graduate students). The Southern Association of Colleges and Schools (SACS) 18-hour requirement must also be met.
Special Federal and State Laws and University Policies

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. By 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 UTK
The appropriate Department Head has responsibility for certifying that the 18-hour requirement is met either through coursework or by documentation that the graduate assistant meets the requirement as an exception (e.g., experience in the performing arts). The Dean and Department Head must sign the appropriate form (APR FORM 1-89) that is attached to the PAF form. This is forwarded to the Office of Human Resource Management. Exceptions should be noted on this form, but a memo and appropriate documentation should be forwarded to the Graduate Office, 404 Andy Holt Tower.

COMPETENCY IN ENGLISH
The University of Tennessee requires all who teach to be competent in spoken English. The specific policy, as it relates to graduate students who teach, is as follows: Since a certain level of competency with English as a spoken language is necessary for effective communication and teaching, all Graduate Teaching Assistants and Graduate Teaching Associates whose first language is not English are required to demonstrate an appropriate level of comprehensibility for classroom teaching by taking the SPEAK Test administered by The Graduate School. The Test of Spoken English (TSE) may be taken in lieu of the SPEAK Test. The results of this test will be communicated by The Graduate School to the appropriate department to be used in determining the nature 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-K, 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 certifying 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 enrollment in an academic program." Thus, first priority of all graduate assistants must be satisfactory progress in their scholastic program. At the same time, acceptance of an assistantship is predicated on the belief that satisfactory progress can be concurrently achieved in work assignments and 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 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 committee in the home unit or college, and the Dean of the College/School involved. If the student feels that a resolution should be sought beyond the Department/College level, the Graduate School should be contacted. The Graduate School will follow established procedures outlined in the Graduate Council Appeals Procedure and/or Hilltopics.

3. Graduate assistants' benefits as employees of the University of Tennessee, in addition to fee waivers as explained elsewhere, include workers' compensation as defined in the Personnel Policies and Procedures Manual under employees' status. The specific wording reads, "Employees so designated [as student employees] receive no benefits other than statutorily required payments which include Workers' Compensation" (Section 100 105-Pr2-3).

4. Graduate student assistantship appointments (Graduate Assistants, Graduate Teaching Assistants, Graduate Teaching Associates and Graduate Research Assistants) are of two types: "academic year" and "twelfth month or other." Students on academic year appointments for the Fall and Spring terms receive 12 equal monthly payments for the 9 months of service and a waiver of fees for three terms (including the Summer). Students appointed to academic year appointment beginning in the Spring term have the option of receiving 7 equal monthly payments for the January-July period or 6 equal payments for the February-July period. In both cases a fee waiver is provided for Spring and Summer terms. Graduate students on "academic year" appointments have assistantship responsibilities in the Summer term. Students appointed to "12 month or other" appointments receive equal monthly payments for the months of the appointments and have assistantship responsibilities for the full period of the appointment. For these appointments a waiver of fees is provided only for those terms included within the appointments (i.e., a waiver of fees for the Summer term requires an appointment which encompasses the Summer term in its entirety.) In some situations, a graduate assistant may be appointed for a period shorter than a year (e.g., a semester which includes final grading 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. By direct supervision of a faculty member experienced in the teaching discipline, receive regular in-service training, and be evaluated regularly.

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

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

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

EVALUATION/SUPervision of Graduate Assistants

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

In cases where corrective measures must be taken to remediate deficiencies, the graduate assistant should be notified in writing...
of recommended action to solve the problem(s). Situations leading to dismissal for cause must be described in writing to the assistant being dismissed. This letter should be written by the supervisor with a copy to the department head. In cases where the assistant feels that unreasonable 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 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 Graduate School officials.

**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. The Graduate School provides a seminar for Graduate Teaching Assistants and Graduate Teaching Associates who will be teaching at the University of Tennessee, Knoxville. Presented in several formats, this seminar includes attention to styles of learning and other student characteristics, communicating in the classroom, leading discussions, lecturing, directing laboratory work, using media and computers, designing syllabi, constructing and using tests, grading, evaluating courses and instructors, and similar topics. Special programs are offered for international GTAs. Supervisors of GTAs are responsible for notifying them about departamental/school policies on attendance at these programs.

**ORIENTATION/TRAINING OF GRADUATE ASSISTANTS AND GRADUATE RESEARCH ASSISTANTS**

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

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

**ACCEPTING/DECLINING AN ASSISTANTSHIP**

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

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

**Student Services**

**Black Cultural Center**

The Center is the focal point of the University's effort to retain African-American students and to promote awareness and recognition of the accomplishments of African-Americans. The Center fulfills this role through a number of services and programs. These include free tutoring, group study sessions, workshops, a collection of African-American books and magazines, a computer lab, and cultural activities and festivals. Typical of its cross-campus work is sponsorship of Black History Month activities, the Annual Martin Luther King Jr. Celebration, African Heritage Day, and festivals which promote awareness of African-American contributions.

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

**Career Services**

Career Services, located in Dunford Hall, 974-5435, is a university-wide department providing career-related assistance to UT Knoxville students through a wide range of programs and services. Included in the services offered are a Career Carnival, an annual career fair providing opportunity to speak informally with representatives from 60-80 different companies about their entry level jobs and hiring practices; a nonprofit career fair involving representatives from numerous area nonprofit organizations; employer information which includes types of majors sought, job descriptions, career profiles, annual reports and other pertinent information for hundreds of companies that recruit at UT; a website including valuable links to dozens of other career-related websites; 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 350 companies, government agencies and school systems. Interviews are scheduled for registrants on the web. Many job listings are also available on the department's website. Career Services also administers a Credentials Service for doctoral candidates. Setting up a credit file is a simple process involving the submission of a resume and academic transcript, along with letters of recommendation. An alumni placement service offers assistance in the job search after graduation. Also thousands of resumes are referred directly to employers every year to assist students and recent alumni in their job-seeking activity. A web-based resume book is made available to employers.

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

**Center for International Education**

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

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

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

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

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

Child Care

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

Dining Services Facilities

Dining Services facilities are air-conditioned, conveniently located in relation to residence halls, and serve nourishing food at reasonable prices. The University recognizes the educational role that its food service facilities play in student life and group living. The Dining Services Department management staff works hard to ensure that the student gets the highest quality meal at the lowest possible cost.

Room and board meal arrangements offer the best combination of balanced, nutritious meals, carefully planned and served at a reasonable charge to the student. Meal plans available are Unlimited Access Plan (unlimited access during hours of operation, Monday–Sunday at 3:00 p.m. with $100 in a debit bonus account per semester); Any Ten Plan (10 meals per week, Monday–Sunday Lunch with $300 per semester in a debit bonus account).

Unlimited Access Plus Plan and the Any Ten Plus plans are new meal plan options for 1998-99. The Unlimited Access Plus Plan offers unlimited access Monday-Sunday until 3:00 p.m. with $600 in a debit bonus account per semester. The Any Ten Plus Plan offers any 10 meals per week with $500 in a debit bonus account per semester.

For students not participating in a meal plan, meals can also be obtained from cafeterias on a cash or charge basis. The Department of Dining Services offers additional dining options. (1) The AllStar Plus Debit Account requires a minimum deposit of $10. There is no bonus with this plan regardless of the size of the deposit. AllStar Plus can be used at all campus dining facilities PLUS laundries, UT Bookstore, and selected vendor areas as well as other participating campus locations. (2) The Dining Club account works just like a charge card. No money is deposited in advance, and no bonus is associated with this account. Food may be purchased at any Dining Services location, and monthly statements are sent to students or parents.

For the late evening snack or morning coffee-break, popular spots on campus are the bakery outlets, delicatessens and grill operations. Students are invited to take advantage of the special "theme" meals offered in the University dining facilities throughout the year.

For additional information, offices are located at 108 Presidential Court Bldg., (423) 974-4111.

For additional information, offices are located at 405 Student Services Building, (423) 974-4111.

Disability Services

Disability Services (DS) seeks to eliminate the barriers that students with disabilities encounter and to work with them to achieve and maintain individual autonomy. The program’s primary objective is to provide these students with access to the academic, social, cultural, and recreational opportunities of the University.

Prospective students are encouraged to contact DS personnel so that they can be assured that the campus facilities and services are adequate to meet their needs. The staff can be of service to the students to the extent that their individual needs are made known. Contact with the students prior to registration enables DS staff to better access the need for interpreters, readers, accessible facilities, and other support services. Van service is also provided to those individuals with mobility limitations, whether permanent or temporary. Documentation of disability from an attending physician or the Student Health Center is required.

Participation in the services program is on a voluntary basis; confidentiality is maintained. Faculty, staff and students desiring any services are encouraged to contact the Office of Disability Services so that necessary arrangements can be made. The office is located at 191 Hoskins Library. V/TTD (423) 974-6087.

Graduate Student Association

As one of the five branches of the Student Government Association, the Graduate Student Association represents the interests of graduate and professional students and provides opportunities for their participation in the organization of graduate study at UT Knoxville. Officers and representatives from each college or professional school are elected each spring term during general campus SGA elections. Offices of the GSA are located in room 342 University Center. For additional information, contact the Department of University Housing at 974-2571.

OFF-CAMPUS HOUSING

A list of off-campus housing available to students is provided by the Department of University Housing. The University does not inspect or approve these facilities. The terms

Disability Services forthefacilities available to students majoring in Speech-Language Pathology or Audiology. It also serves as a community hearing and speech center providing diagnostic and treatment services for persons of all ages exhibiting communication disorders/differences.

Housing

UNIVERSITY APARTMENTS

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

RESIDENCE HALLS

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

A limited number of Assistant Hall Director positions are available for single graduate students. This position assists the Hall Director in coordinating and supervising all aspects of the hall operation. This is a five-in position with part-time responsibilities on a nine-and-a-half month contract. For additional information, contact the Department of University Housing at 974-2571.
and conditions for the rental of off-campus housing are between the student and the landlord. Students living in off-campus housing are expected to observe the same rules of conduct and standards applicable to all students.

Minority Student Affairs

The Office of Minority Student Affairs is designed to enhance the quality of life for minority students. Working in conjunction with other campus and community groups, the office helps identify, encourage, and assist students with academic and personal concerns. The Center also provides opportunities for students to develop their leadership potential.

Housed within the Black Cultural Center, the office furnishes information about educational, employment, and financial opportunities, and offers tutorial services, workshops, and career development programs.

The office is located at 812 Volunteer Boulevard.

Religious Resources

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

Student Counseling Services Center

The Student Counseling Services Center (SCSC) provides a variety of services for students with personal and academic concerns to promote academic performance, increase personal growth and contribute to the mental health of the entire community. Services include: crisis intervention, group therapy, individual therapy, academic courses, outreach programs and consultation.

To access services, students may come in for an intake interview Monday-Friday from 10:00-11:30 a.m. and 1:00-3:30 p.m. The Center is located at 900 Volunteer Blvd. and can be reached at 974-3846.

Vehicle Operation and Parking

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

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

1. Staff and students with current UT Knoxville motor vehicle registration tags in their vehicles may park in any unreserved area (except those around residence halls) between the hours of 10 a.m. and 7 a.m., Monday through Friday, and 12 noon Saturday to 7 a.m. Monday.

2. General parking is permitted in staff areas around the residence halls between 5 p.m. and 3 a.m. After this time, vehicles without permits for these areas may be towed.

3. Staff and students with current UT Knoxville parking permits may park in unreserved staff areas around the academic buildings from 5 p.m. to 7 a.m.

4. Overnight parking is not permitted in the Student Commuter Parking Areas nor in the Student Aquatic Center Parking Area.

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

A University Traffic and Parking Authority determines parking policy, traffic regulations, and fees. This information is published each year in the "University Traffic and Parking Regulations," and is available at registration at the Parking Services Office, 1411 White Avenue, at the Campus Information Center at Circle Park, and at the vehicle point of registration.

Women's Center

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

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

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

Graduate programs of the College of Agricultural Sciences and Natural Resources are designed to prepare men and women for positions of leadership in industry, state and federal government, teaching, research, and extension. The graduate student is expected to demonstrate a thorough knowledge of the subject matter in his/her specialized field of study and its relationship to the sociological, economic, and environmental impact on society. The student must demonstrate the ability to plan, conduct, analyze, and report original research. Emphasis is given to intellectual growth and the development of scholarly habits of study, reasoning and analysis so that the graduate will continue to grow and develop professionally throughout his/her career.

MASTER OF SCIENCE PROGRAMS

Programs of graduate study leading to the Master of Science degree are offered through all departments in the College of Agricultural Sciences and Natural Resources. The graduate program may be entirely in one major subject or may include subject matter areas related to the major.

Both majors and minors are available in Agricultural Economics, Agricultural and Extension Education, Animal Science, Biosystems Engineering, Biosystems Engineering Technology, Entomology and Plant Pathology, Food Science and Technology, Ornamental Horticulture and Landscape Design, and Plant and Soil Science. Majors only are available in Forestry and Wildlife and Fisheries Science, and minors are available in General Agriculture and Rural Sociology. The minor in General Agriculture requires 12 hours of coursework. A complete listing of majors is shown on the Majors and Degree Programs Chart.

DOCTORAL PROGRAMS

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

College of Architecture and Planning

Marleen Davis, Dean
William J. Lauer, Associate Dean
David A. Patterson, Acting Director
Jon P. Coddington, Graduate Program Head, Architecture

Schools
Architecture
Planning

Facilities for Research and Service
Center for Research, Service and Inquiry

The College of Architecture and Planning was formed in 1990 with the union of the School of Planning and the School of Architecture into a new academic unit. Both schools are committed to preparing students to work with the planning, design or management of our built environment. The college provides an administrative umbrella for academic programs which share many common objectives and methods, yet retain distinctive identities with their professions.

Most states require that an individual intending to become an architect hold an accredited degree. There are two types of degrees that are accredited by the National Architectural Accrediting Board: (1) The Bachelor of Architecture, which requires a minimum of five years of study, and (2) The Master of Architecture, which requires a minimum of three years of study following an unrelated bachelor's degree or two years following a related preprofessional bachelor's degree. These professional degrees are
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.

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

GENERAL INFORMATION

Foreign Study Courses

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

Off-Campus Study

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

College of Business Administration

C. Warren Neel, Dean
Jan R. Williams, Associate Dean
William F. Fox, Director, Center for Business and Economic Research
John E. Riblett, Director, Management Development Center
Gary N. Dier, Interim Associate Dean and Director, Graduate Business Programs

Departments

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

Facilities for Research and Service

Center for Business and Economic Research
Management Development Center

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

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

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

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

GRADUATE PROGRAMS

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

The two College-wide programs, the MBA and the Ph.D. in Business Administration, are described in Business Administration, Field of Instruction. Descriptions of other degree programs are under the appropriate department 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 Office of Graduate Business Programs in the College of Business Administration.

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

College of Communications

Dwight L. Teeter, Jr., Dean
Herbert H. Howard, Associate Dean for Graduate Studies
Roxanne Hovland, Associate Dean for Undergraduate Studies

Departments and Schools
Advising
Broadcasting
Journalism
Speech Communication

Facility for Research and Service
Communications Research Center (CRC)

The College of Communications grew out of the School of Journalism, which was originally located in the College of Business Ad-

ministration. The master's program began in 1968 under Journalism and was changed to Communications after the School gained College status in 1970. The doctoral program was initiated in 1974. A chair of excellence was established in 1987 to support a distinguished professorship in science, technology, and medical writing. Communications media are a vital force in today's complex society. Specialization, gaps among segments of society, and the nature of world conflict point to the need for more understanding of how people communicate. Educating men and women in the perceptive understanding of the communications media is a necessity. The graduate programs in the College acquaint students with the nature of communications and prepare them for professional work in many fields.

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

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

For application forms and other information about the M.S. and Ph.D. programs in Communications, write to Associate Dean for Graduate Studies, College of Communications, 426 Communications Building, The University of Tennessee, Knoxville, TN 37996-0347.

College of Education

C. Glennon Rowell, Interim Dean
Thomas W. George, Associate Dean for Student and Academic Services
Carol E. Kasworm, Associate Dean for Research and Technology
Lynn C. Cagle, Director, Teacher Education

Units
Counselor Education and Counseling Psychology
Cultural Studies in Education
Education in the Sciences, Mathematics, Research, and Technology
Exercise Science
Holistic Teaching/Learning
Inclusive Early Childhood Education
Language, Communication and Humanities Education
Leadership Studies in Education
Psychoducational Studies
Rehabilitation, Deafness, and Human Services
Sport and Physical Activity

Facilities for Research and Service
Bureau of Educational Research and Service
Center for Educational Research and Service
Center for Literacy Studies
Center for Physical Activity and Health
Curriculum Lab
Exercise Physiology Lab/Biomechanics Lab

Institute for Assessment and Evaluation
Institute for Educational Innovation
Instructional Services Center
Reading Center
Tennessee Internship Consortium in Professional Psychology

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

The College of Education, as a professional school, promotes critical inquiry, reflection, and social action through interdisciplinary studies. Its graduates are prepared to work in a changing, multicultural world in leadership roles in educational programs and institutions, health and social institutions, and private and corporate sectors. The College is committed to providing lifelong learning for both faculty and students by promoting continuing study that involve students and faculty in academic peer relationships that stress shared responsibility for learning and for the discovery of new knowledge. The faculty is committed to research, scholarship, and creative work that results in superior teaching and service to the community and to the professions. The College is committed to working towards equity and economic and social justice within the University community and throughout the broader society.

Beginning in 1991, the faculty of the College of Education initiated planning new approaches to organization, new approaches to working with students, and new approaches to working with colleagues in teaching and the other professions served by the College. The purpose of the restructuring process was to enable the College to better meet the needs of students, faculty, and constituent groups in the 21st century.

As a result of this process, the College, previously organized into seven departments, is now organized into eleven faculty/program units.

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

MASTER OF SCIENCE PROGRAMS

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

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

Degree program requirements are described under Education, Fields of Instruction.
SPECIALIST IN EDUCATION PROGRAM
The College of Education offers a program leading to the Specialist in Education with a major in Education.
Degree program requirements are described under Education, Fields of Instruction.

DOCTORAL PROGRAMS
The College of Education offers programs of advanced study leading to the Doctor of Education and the Doctor of Philosophy, both with a major in Education.
Degree program requirements are described under Education, Fields of Instruction.

TEACHER LICENSURE
Applicants for initial teacher licensure must gain admission to the college's Teacher Education Program. Further details concerning the teacher licensure program are described under Education, Fields of Instruction, and are available through the College of Education Graduate Center (Claxton Addition, Rm. 211).

College of Engineering
Jerry E. Stoneking, Dean
Fred Gilliam, Associate Dean, Academic Affairs
Fred D. Tompkins, Associate Dean, Administration

Departments
Chemical Engineering
Civil and Environmental Engineering
Electrical Engineering
Industrial Engineering
Materials Science and Engineering
Mechanical and Aerospace Engineering and Engineering Science
Nuclear Engineering

Facilities for Research and Service
Measurement and Control Engineering Center
Center for 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.

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, mechanical engineering, metallurgical engineering, and mathematics and physics. All programs lead to the Master of Science degree. Also, Ph.D. programs are available in many of these fields. Information may be obtained from the Registrar, The University of Tennessee Space Institute, Tullahoma, TN 37388.

College of Human Ecology
Jacquelyn O. Delonge, Dean
James D. Moran III, Associate Dean: Graduate Studies
Jackie H. McWhirter, Associate Dean: Academic Administration

Departments
Child and Family Studies
Consumer and Industry Services Management
Health and Safety Sciences
Human Resource Development
Nutrition

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

Human Ecology brings together the natural and social sciences to enhance the well-being of individuals, families and communities across the life span.
The University of Tennessee was one of the first institutions of higher education in the South to offer home economics, with the first class being offered in 1897. Initially called a School of Home Economics, it combined with Agriculture in 1947 to become the College of Agriculture and Home Economics. In 1959, the two colleges became separate units, although they continue to share resources. In 1985 the name was changed to Human Ecology, reflecting its focus on people interacting with their environments.
Graduate study in Human Ecology prepares the student for teaching, research, and public service in colleges and universities or managerial positions in government, business, and industry.
The Master of Science degree is offered with majors in Child and Family Studies, Health Promotion and Health Education, Human Resource Development, Nutrition (including public health nutrition), Recreation, Tourism and Hospitality Management, Safety Education and Service, and Textiles, Retailing and Consumer Sciences; the Master of Public Health degree is offered with a major in Public Health; and the Doctor of Philosophy degree is offered with a major in Human Ecology and concentrations in child development, community health, family studies, human resource development, nutrition science, retail and consumer sciences, and textile science. For additional information, contact the Associate Dean of Graduate Studies, College of Human Ecology. The University of Tennessee, Knoxville, TN 37996-1900, (423) 974-5224.

FACILITIES FOR RESEARCH AND SERVICE
The Small Animal Research Lab, housed in the Jessie Harris Building, has received certification by the American Association for Accreditation of Laboratory Animal Care (AAALAC). Renovated in 1985, it has strict environmental controls, an operating theater and diet preparation room.
The College of Human Ecology participates with the College of Engineering in the Center of Excellence for Materials Processing. These research efforts in Textile Science are also supported by the Textiles and Nonwovens Development Center (TANDEC).
The Child Development Laboratory (CDL) serves as a research and training facility for students in the College.
The mission of the Institute of Tourism and Leisure Industries is to serve as a catalyst for stimulating economic growth by providing a medium through which tourism and leisure industries can collectively develop and focus on strategies that will address how to improve the economic climate and overall quality of life in the region.
Refer to the section on Facilities for Research and Service for additional information.

College of Law
Richard S. Wirtz, Dean
John L. Sobieski, Jr., Associate Dean
Dennis B. Pollard, Assistant Dean

The University of Tennessee College of Law commenced operation in 1869 and has continuously sought to provide high-quality legal education in a university community.
While the principal objective of the college is to prepare students for the private practice of law, its total mission is more broadly conceived. The college exposes students to the legal issues of our society enabling them to develop analytical skills with respect to decisional law and statutes, the ability to communicate effectively their knowledge of the law, an awareness of the historical growth of the law, a knowledgeable appreciation of the interrelationship of law and society, and the ability to use law as an implement of societal control and development. Students are thus equipped to serve their communities not only as advocates and counselors, but as policy makers and active, responsible citizens.

THE PROFESSIONAL PROGRAM
The program of the college has three dimensions: teaching and learning, research into and appraisal of our legal systems and institutions, and services to the community. Each plays a significant role in the college as a modern law center.
The teaching and learning element of legal education at the college involves a cooperative classroom interaction between faculty and students in the analytical study of a host of
questions and problems found in today's legal profession. These involve decisional law, statutory interpretation, administrative regulation, techniques of trial and appellate advocacy, and the roles and responsibilities of the lawyer in advising and representing clients. While proper consideration is given to the problems of Tennessee law, the course of study is conducted with a view toward providing an awareness and understanding of the regional and national perspective to prepare students for service in any state.

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

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

**GRADUATE PROGRAM**

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

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

**College of Nursing**

Joan Creasia, Dean
Carol Sessor, Associate Dean
Maureen Groer, Associate Dean for Research and Evaluation
Martha Alligood, Director of Master's Program
Sandia P. Thomas, Director of Doctoral Program
Mary Anne Modricin-McCarthy, Director of Undergraduate Program

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

The College of Nursing was established in July 1971. The master's program was initiated in 1976 and approved for the doctoral program 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. A special bulletin describing facilities, admission, fees, and degree requirements is available from the College of Social Work, Henson Hall, Knoxville, TN 37996-3393.

**College of Veterinary Medicine**

Michael Shires, Dean
James J. Brace, Associate Dean

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

The College of Veterinary Medicine, established in 1974, offers a professional curriculum leading to the Doctor of Veterinary Medicine (D.V.M.) degree. The college offers graduate studies leading to the Master of Science and the Doctor of Philosophy degrees. Residency training programs in the various clinical specialties are also offered. The primary objective of the college is to enable students to attain essential information, skills, attitudes, and behaviors to meet the varied needs of society and the veterinary profession. The professional curriculum provides an excellent basic science education in addition to training in diagnosis, disease prevention, medical treatment, and surgery.

Graduates are qualified to pursue careers in many facets of veterinary medicine and related health professions.

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

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

Excellent research opportunities exist for veterinarians—research directly benefiting animals and research conducted with animals which benefit humans. Such opportunities are available at colleges and universities and with governmental agencies, private research institutions and biological and pharmaceutical companies.
FIELDS OF INSTRUCTION
**Fields of Instruction**

**Accounting and Business Law**

(College of Business Administration)

**MAJORS**

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

Keith G. Stanga, Head

**Professors:**

- Anderson, Kenneth E., CPA, Ph.D. ................... Indiana
- Dittrich, Norman E. (Emeritus), CPA, Ph.D. ........ Ohio State
- Fisher, Bruce D., LL.M. .................. George Washington
- Herrin, Hartwell C., III, CPA, Ph.D. .............. Alabama
- Kiger, Jack E. (Warren L. Slagle Prof. of Acct), CPA, Ph.D. .................. Missouri
- Reeve, James M. (Distinguished Prof.), CPA, Ph.D. .......... Oklahoma State
- Roth, Harold P., CPA, Ph.D. .......................... VPI
- Stanga, Keith G. (Arthur Andersen Prof.), CPA, Ph.D. ........ Louisiana State
- Williams, Jan R. (Ernst & Young Prof.), CPA, Ph.D. ............... Arkansas

**Associate Professors:**

- Ayers, Susan, CPA, Ph.D. ..................... Arizona State
- Behn, Bruce K., CPA, Ph.D. .................. Arizona State
- Cancell, Joseph V., CPA, Ph.D. ............. Georgia State
- Hethcox, Kathleen B., Ph.D. .................. Oklahoma

**THE MASTER OF ACCOUNTANCY PROGRAM**

The objective of the M.Acc. program is to provide persons who have a high level of

ability and motivation with the depth and understanding of accounting that will enhance

their probability of success in a career in professional accounting. Moreover, the

student's educational experience should develop perspectives toward the discipline of

accounting in a manner that will enable the student to spearhead innovation and change in

response to needs in public accounting, industry, and government.

UTK's accounting undergraduate and graduate programs are accredited by the

American Assembly of Collegiate Schools of Business and are among the initial programs in

the nation to receive this accreditation.

**Admission Requirements**

Application deadlines for international

students are: Fall and Summer, January 15.

Application deadlines for U.S. citizens and

permanent residents are: Fall and Summer,

March 1. The program is designed both for

students who have completed an accredited

baccalaureate degree program with a major in

accounting and others. Those without outstanding

undergraduate records in areas other than

accounting may earn the M.Acc. degree by

completing prerequisites in accounting and by

including courses in other business and related
disciplines to supplement the applicant's

undergraduate background. Students entering

the program should be computer literate and

are expected to have completed coursework in

calculus, principles of accounting, and

introductory economics.

In addition to the general admission

requirements for The Graduate School, M.Acc.
applicants are required to take the Graduate

Management Admission Test (GMAT) and submit

information on forms provided by the

College of Business Administration. Applicants

whose native language is not English must

submit results of the Test of English as a

Foreign Language (TOEFL).

**Course Requirements**

A student's program encompasses a

minimum of 30 semester hours of graduate

coursework. Specifically, the student must

complete courses in accounting and other

areas as indicated below. Each course is 3

semester hours of graduate credit.

A student with an undergraduate degree in

accounting can usually complete the program in

about eleven months. A student without an

undergraduate accounting degree can usually

complete the program in about fifteen months.

For students with an undergraduate

accounting degree, the requirements are:

**Business Core (9 hours):** Business Administration 502-01; Business Law 511.
**Accounting Core (6 hours):** 506-07.
**Accounting Concentration (9 hours):**
Three concentrations are available:
3. Taxation: 531, 532, 533, 534, 539.

Students must take at least three courses
from the same concentration and one of the

course numbers must end with 9.

**Accounting Electives (6 hours):** Elective courses to be taken from graduate accounting courses.

For students without an undergraduate

Accounting degree, the requirements are:

**Prerequisites:** 311, 341, 411, 414, 431.
**Business Core (12 hours):** Business Administration 502-03; Business Law 511; and a non-accounting business elective to be approved by advisor.
**Accounting Core (9 hours):** 506-07, 521.
**Accounting Concentration (9 hours):**
Three concentrations are available:
3. Taxation: 531, 532, 533, 534, 539.

Students must take at least three courses
from the same concentration and one of the

course numbers must end with 9.

**Transfer Credits**

A maximum of six semester hours taken at

other AACSB accredited institutions that

otherwise conform to the transfer policy of The

Graduate School may be credited toward

M.Acc. degree requirements.
Other Requirements
To qualify for the degree, a student must maintain a B average (3.0) or above in the program. The student must satisfactorily demonstrate his/her ability to recognize, analyze, and solve accounting policy problems and integrate concepts from the various areas of accounting by passing a comprehensive written examination. This examination is included in the capstone courses in each concentration as follows: 519, Seminar in Accounting and Auditing Policy; 539, Tax Policy; and 549, Systems Issues and Policies.

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 doctorate sequence designed to expose students to current research in accounting research. Courses in accounting and other areas are selected to supplement the student’s individual background and to prepare the student in an area of accounting specialization (financial, managerial, auditing, tax or systems). The final year is normally spent completing the doctoral dissertation.

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

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

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

Accounting
GRADUATE COURSES
415 Governmental and Nonprofit Accounting (3) Contemporary issues in theory and practice of governmental accounting principles; environment of state and local government; governmental accounting principles; fund accounting; accounting for non-governmental non-profit entities. Prereq: 414 or consent of Instructor.

451 Operational Auditing and Consulting (3) Approaches to evaluating 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 (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N only. E

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

514 Information Systems Control and Auditing (3) Relationships among design of internal controls, assessment of internal control effectiveness, and audit of internal controls in computerized business environment. Current security and technology issues for both centralized and distributed computer environments. Hands-on use of computer-assisted audit techniques to perform variety of audit tasks. Prereq: Admission to M.Acc. program.

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


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

531 Tax Research, Methods, and Procedures (3) Development of expertise in tax research using authoritative source through available technologies. Advanced study of tax accounting methods, periods, procedures, and review of fundamental tax concepts to provide foundation for tax practice. Prereq: 431 and admission to M.Acc. program.

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

533 Taxation of Partnerships and S Corporations (3) Formation, operation, termination, and other special problems of partnerships. Election for S Corporations, and comparison of partnerships and S Corporations. Prereq: Admission to M.Acc. program or consent of instructor. Prereq or coreq: 531.

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

539 Tax Policy (3) Basic concepts of tax policy: complexity, equity, efficiency, alternative tax bases, and political process. Current issues in tax policy and strategy: organizational form, implicit taxes, arbitrage, tax rates, and selected other topics. Prereq: 431 and admission to M.Acc. program.

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

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

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

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

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

594 Graduate Seminar in Accounting (3) Topics vary. Prereq: Admission to M.Acc. program or consent of instructor.

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

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

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

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

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

Advertising
(College of Communications)

MAJOR

DEGREES

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

Ronald E. Taylor, Head

Professors:

Hovland, Roxanne, Ph.D. ......................... Illinois

Taylor, Ronald E., Ph.D. ......................... Illinois

Associate Professors:

Haley, Eric, Ph.D. ............................... Georgia

Hoy, Mariea, Ph.D. .............................. Oklahoma State

Assistant Professors:

Morrison, Margaret, Ph.D. ..................... Georgia

Raman, Niranjani, Ph.D. ...................... Texas

The Department of Advertising offers a concentration area for the master’s degree with a major in Communications and participates in the interdisciplinary doctoral program. See Communications for additional information.

GRADUATE COURSES

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

See Mechanical and Aerospace Engineering

Agricultural and Extension Education

(College of Agricultural Sciences and Natural Resources)

MAJOR

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

Roy R. Lessly, Head

Professors:

Carter, Cecil E., Jr. (Emeritus) ...................................................... Ohio State
Dickson, Lewis H. (Emeritus), Ed.D. ....... Cornell
Lessly, Roy R. (Liaison), Ed.D. .................. Oklahoma State
Todd, John D., Ed.D. .............................................................. Illinois

Associate Professor:

Waters, Randal G., Ph.D. .............................................................. Penn State

The Department of Agricultural and Extension Education offers a program leading to the Master of Science degree with a major in Agricultural and Extension Education. The program is designed primarily for teachers of Agricultural Education and staff employed by the Agricultural Extension Service. However, due to the flexibility of the program, it would be of value to any student interested in agriculture or 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 School and those stipulated by the department.

THE MASTER'S PROGRAM

Thesis Option

A candidate for the master's degree who elects the thesis option must successfully complete:

1. A minimum of 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 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 30 hours of graduate credit in courses approved by the student's advisory committee.
2. A minimum of 12 hours of graduate credit in courses numbered at or above the 500 level.
3. A minimum of 12 hours of graduate credit in courses appropriate to the area of concentration taught in the department and a minimum of 6 hours taught from outside the department.
4. A minimum of 3 hours of graduate credit in coursework in either research methodology or statistics.
5. A creative component designed by the student and approved by the student's advisory committee for 3 hours of graduate credit.
6. A written and oral comprehensive examination.

GRADUATE COURSES

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

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

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

521 Extension Program Planning (3) Methods of developing county extension programs: sources of essential basic information, determination of problems and needs of people, functions of lay people and various groups of extension workers. Use of committees, step-by-step planning procedures, coordinated county and state plans and characteristics of effective programs. Prereq: 411 or consent of instructor. Sp

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

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

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

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

526 Agricultural Education for First-Year Teachers (2) Developing competencies needed by first-year teachers for planning, organizing and conducting program of vocational agriculture in local community. Group meetings in selected centers and visits by instructor. Prereq: 436, 438 or consent of instructor.

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

528 Advanced Techniques for Teaching Agricultural Mechanics (3) Teaching techniques; determining needed competencies, organizing and managing agricultural mechanics facilities. Prereq: 435, 436 or consent of instructor.

529 Supervised Occupational Experiences in Agricultural Education (3) Historical and philosophical bases for supervised occupational experiences in agriculture and organizational patterns and procedures for conducting programs for farm and off-farm agricultural occupations. Prereq: 435, 436 or consent of instructor.

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

531 Extension History, Philosophy and Objectives (2) 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: 411 or consent of instructor. Sp

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

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

Agricultural and Biosystems Engineering

(College of Agricultural Sciences and Natural Resources)

MAJORS

Biosystems Engineering .............................................. M.S., Ph.D.
Biosystems Engineering Technology .......................... M.S.

C. Roland Moyle, Head

Professors:

Bladsoe, B. L., Ph.D. .............................................................. Oklahoma State
Henry, Z. A. (Emeritus), PE, Ph.D. .......................... NC State
Luttrell, D. H. (Emeritus), Ph.D. .............................. Iowa State
Mc Dow, J. L. (Emeritus), PE, Ph.D. .......................................... Michigan State

Wills, J. B., M.S. .............................................................. Tennessee

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

526 Agricultural Education for First-Year Teachers (2) Developing competencies needed by first-year teachers for planning, organizing and conducting program of vocational agriculture in local community. Group meetings in selected centers and visits by instructor. Prereq: 436, 438 or consent of instructor.

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

528 Advanced Techniques for Teaching Agricultural Mechanics (3) Teaching techniques; determining needed competencies, organizing and managing agricultural mechanics facilities. Prereq: 435, 436 or consent of instructor.

529 Supervised Occupational Experiences in Agricultural Education (3) Historical and philosophical bases for supervised occupational experiences in agriculture and organizational patterns and procedures for conducting programs for farm and off-farm agricultural occupations. Prereq: 435, 436 or consent of instructor.

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

531 Extension History, Philosophy and Objectives (2) 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: 411 or consent of instructor. Sp

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

593 Special Problems in Agricultural and Extension Education (1-4) Special research and/or special reports based on supervised independent study. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E
Associate Professors:
Buschermohle, Michael J., Ph.D. ... Clemson
Freeland, R.S., Ph.D. ... Purdue
Grandle, G.F., Ph.D. ... Tennessee
Hart, W.E., Ph.D. ... Purdue
Wilkinson, J.B., Ph.D. ... Purdue
Yoder, D.C., Ph.D. ... Purdue
Yoder, R.E., Ph.D. ... Colorado State

Assistant Professors:
Burns, R.T., Ph.D. ... Tennessee
Hubert, G.J., Ph.D. ... Illinois
Ramian, D.R., Ph.D. ... Cornell
Womac, A.R., Ph.D. ... Tennessee

Graduate programs leading to the Master of Science and Doctor of Philosophy with a major in Biosystems Engineering are available to graduates of a recognized curriculum in engineering, mathematics, or one of the physical or biological sciences. A graduate program leading to the Master of Science in Biosystems Engineering Technology is available to graduates in a recognized curriculum in agriculture or other related fields. Each applicant will be advised about any prerequisite courses before entering a program. The student's program of study must be approved by his/her advisory committee and must comply with the requirements of The Graduate School.

A completed departmental data sheet and three completed Graduate School Rating Forms are required in addition to The Graduate School application.

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

THE MASTER'S PROGRAMS

Biosystems Engineering

Applicants who have not previously earned a degree from an ABET-accredited engineering program must submit scores from the GRE general and engineering subject examinations. 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
  - Thesis Option: Applicants who have not previously earned a degree from a professionally accredited program within the U.S. must submit scores from the GRE General Examination. 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:
  - 12 hours of course in computational methods (mathematics, computer science, statistics, or any course containing appropriate computational components that may be approved by the department)
  - 6 hours of program electives
  - 6 hours of thesis

- Non-Thesis Option: A non-thesis option in Biosystems Engineering Technology is available to qualified students. Applicants who have not previously earned a degree from a professionally accredited program within the U.S. must submit scores from the GRE General Examination. 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:
  - 12 hours of course in computational methods (mathematics, computer science, statistics, or any course containing appropriate computational components that may be approved by the department)
  - 6 hours of program electives
  - 6 hours of coursework in special emphasis area
  - 3 hours of Capstone Experience (project and report, typically 500)

In addition to completing the 33 semester hours, master's students must pass a final oral examination covering the thesis, related areas, and graduate coursework.

Biosystems Engineering Technology

Degree Options:

- Thesis Option: Applicants who have not previously earned a degree from a professionally accredited program within the U.S. must submit scores from the GRE General Examination. Applicants accepted into the program must complete at least 75 hours of approved graduate credit (beyond the baccalaureate degree) in Biosystems Engineering and supporting areas (engineering, computational methods, agriculture and biological sciences, and other related areas). Of the 75 hours, 48 must be in courses numbered greater than 500 (including 24 hours of course 600) and 6 hours of courses at UTK numbered greater than 600. Other specific requirements for the minimum 75 hours are:
  - 18 hours of coursework in computational methods (mathematics, computer science, statistics, or any course containing appropriate computational components that may be approved by the department)
  - 9 hours of program electives
  - 3 hours of Seminar (504, 505 or equivalent courses)
  - 24 hours of 600 Dissertation

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

THE DOCTORAL PROGRAM

Departmental Requirements:

Students applying for admission into the doctoral program must submit evidence of ability to perform and report independent research to the satisfaction of the faculty of the department. An approved master's thesis will usually be acceptable for this purpose. Scores on the GRE General and Engineering subject examinations also are required for applicants who have not received a degree from an ABET-accredited engineering program. To earn a degree, each doctoral student must complete at least 78 hours of approved graduate credit (beyond the baccalaureate degree) in Biosystems Engineering and supporting areas (engineering, computational methods, agricultural and biological sciences, and other related areas). Of the 78 hours, 48 must be in courses numbered greater than 500 (including 24 hours of course 600) and 6 hours of courses at UTK numbered greater than 600. Other specific requirements for the minimum 78 hours are:

- Major subject courses
- 18 hours of coursework in computational methods (mathematics, computer science, statistics, or any course containing appropriate computational components that may be approved by the department)
- 9 hours of program electives
- 3 hours of Seminar (504, 505 or equivalent courses)
- 24 hours of 600 Dissertation

Biosystems Engineering

GRADUATE COURSES

403 Machine and Component Design (3) Nature of design; functional analysis; creative geometric and kinematic requirements; plane mechanisms, force, stress, deflection, friction, analysis and synthesis of power transmission and control circuits.

423 Irrigation and Water Management System Design (3) Design of irrigation and agricultural water management systems with consideration given to flash flood characteristics, climate, water quality, system characteristics, and impact on crop yield and water quality.

430 Mobile Hydraulic Power System Design (3) Functional and operational characteristics of mobile hydraulic system components: pumps, valves, actuators; analysis and synthesis of power transmission and control circuits.

451 Electronic Systems (4) Basic electronics with biological applications. Analog and digital electronics; sensing and controlling physical and environmental parameters; sensor selection and interfacing, signal conditioning, process control. Laboratory experiments and design projects.

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

502 Registration for Use of Facilities (3-16) 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 Professional Development Seminar (1) Planning and executing research program; ethics and professionalism; departmental procedures and resources. (Same as Biosystems Engineering Technology 504.) S/N only. F

505 Professional Communications Seminar (1) Reviews and discusses works, issues, and problems in graduate education. May be repeated with different emphasis. Maximum 6 hrs. (Same as Biosystems Engineering Technology 505.) S/N only. F,A

506 Doctoral Seminar (1) Seminar for doctoral students on research and professional development; may be repeated with different emphasis. Maximum 6 hrs. (Same as Biosystems Engineering Technology 506.) S/N only. F,A

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

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

541 Principles of Compost Engineering (3) Comprehensive study of composting; survey of installed systems; thermodynamics of composting; chemical analysis of compost; microorganisms and composting; practical methods of composting.

543 Instrumentation and Measurement (3) Modern instrumentation techniques. Static and dynamic response of instrumentation; signal conditioning; temperature, moisture, optical radiation, displacement, strain, pressure, velocity, acceleration, and flow measurements; digital data acquisition and control. Prereq; Basic Calculus or Finite Mathematics.

545 Monitoring Hydrologic Phenomena (3) Application of instrument techniques to monitoring hydrologic phenomena; strengths and weaknesses of different monitoring systems. Prereq; Environmental Science 321, 341. 2 hrs and 1 lab. (Same as Environmental Engineering 543.) F,A

546 Automation Devices and Applications (3) Basics of automation systems; programmable controllers, data acquisition, digital logic and transducers. Prereq; 506 or consent of instructor. 2 hrs and 1 lab. Sp,A

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

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

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

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

590 Computer Simulation of Agricultural Systems (3) Scientific approach to digital simulation; system definitions and boundaries, formulation of models, algorithms and solution techniques, encoding of precision equations models, algorithms and solution techniques, encoding of precision equations in model output, verification and validation of simulation model results. Prereq; Basic Engineering 101, 201 or equivalent. 2 hrs and 1 lab. (Same as Environmental Engineering 590.) S/N only. F

600 Feedback and Control Systems (3) Differential equations for physical systems; transformations, and system response. Types of control, frequency response, system compensation, and system analysis. Application to agricultural systems. Prereq; 451, Mathematics 231, Basic Engineering 101, 201 or equivalent. 2 hrs and 1 lab. (Same as Chemical Engineering 600.) S/N only. F

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

622 Food and Process Engineering Technology (3) Application of basic engineering principles to agricultural and food processes: fluid handling, drying, evaporation, thermal processing, heating and cooling, refrigeration systems, and materials handling. Prereq; Introductory Physics, Basic Calculus. 2 hrs and 1 lab. F

632 Agricultural Machinery and Tractors (3) Selection, matching, and management of agricultural machinery and tractors. Safety considerations; field capacity, field efficiency, cost analysis, and field management strategies. Functional analysis of tillage operations, planting and drills, no-tillage systems, hay harvest systems, forage and small grain harvesting, and cotton harvesting. Crop drying processes, off-road machinery safety considerations, and operator ergonomics. Prereq; Basic Calculus or Finite Mathematics or equivalent. 2 hrs and 1 lab. Sp,

642 Agricultural Waste Management and Pollution Control (3) Waste renovation fundamentals; characteristics of animal manure; techniques for collection, transportation and storage. Prereq; Basic Calculus or Finite Mathematics or equivalent. 2 hrs and 1 lab. F

643 Instrumentation and Measurement (3) Modern instrumentation techniques. Static and dynamic response of instrumentation; signal conditioning; temperature, moisture, optical radiation, displacement, strain, pressure, velocity, acceleration, and flow measurements; digital data acquisition and control. Prereq; Basic Calculus or Finite Mathematics. 2 hrs and 1 lab. Sp,A

645 Monitoring Hydrologic Phenomena (3) Application of instrument techniques to monitoring hydrologic phenomena; strengths and weaknesses of different monitoring systems. Prereq; Environmental Science 321, 341. 2 hrs and 1 lab. (Same as Environmental Engineering 645.) F,A

646 Automation Devices and Applications (3) Basics of automation systems; programmable controllers, data acquisition, digital logic and transducers. Prereq; 506 or consent of instructor. 2 hrs and 1 lab. Sp,A

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

Agricultural Economics and Rural Sociology

(Agriculture and Natural Resources)

MAJOR

Dan McLemore, Acting Head

Professors:

Badenhop, M. B. (Emeritus), Ph.D. Purdue
Brooke, J. R. (Liaison), Ph.D..................Florida
Celand, C. L. (Emeritus), Ph.D. Wisconsin
Eastwood, D. B., Ph.D.........................Tufts
English, B. C., Ph.D.............................Iowa State
Keller, L. H. (Emeritus), Ph.D. Kentucky
Klindt, T. H., Ph.D....................................Kentucky
Leuthold, F. O., Ph.D....................................Wisconsin
McLemore, D. L., Ph.D............................Iowa State
Carr, M. R. (Emeritus), Ph.D..................Wisconsin
Martin, J. A. (Emeritus), Ph.D..................Minnesota
Mundy, S. D., Ph.D......................................Tennessee
Park, R. H., Ph.D......................................Illinois
Pate, W. M., Ph.D..................................Virginia Tech
Petticoat, B. H. (Emeritus), J.D...............Tennessee
Ray, Daryl E. (Bernard Blasingame Chair of Excellence), Ph.D. Iowa State
Riley, John B., Ph.D...............................Oklahoma State
Roberts, R. K., Ph.D...............................Oklahoma State
Sappington, C. B. (Emeritus), Ph.D..............Illinois
Whatley, T. J., (Emeritus), Ph.D..................Purdue
Williamson, H., Ph.D..............................Missouri

Associate Professors:

Jensen, K. L., Ph.D................................Oklahoma State
Pompeii, G. K., Ph.D..............................California (Davis)

Assistant Professors:

Jakus, Paul M., Ph.D.........................NC State
Larson, J. A., Ph.D.............................Oklahoma State

The Department of Agricultural Economics and Rural Sociology offers programs of graduate study leading to the Ph.D. and M.S. The doctoral program includes courses and seminars in agriculture, economics, sociology, and rural development. The M.S. program may be completed under a thesis option with concentrations in agricultural economics or rural sociology. A non-thesis
THE MASTER'S PROGRAM

Thesis Option
A candidate for the master's degree must complete a minimum of 33 hours of graduate credit in courses approved by the student's master's committee. Six hours of thesis may be counted toward this requirement. At least 27 hours of graduate credit must be earned in courses numbered at or above the 500 level. In the agricultural economics concentration, 15 hours of agricultural economics, 6 hours of economic theory and 6 hours of quantitative methods are required. In the rural sociology concentration, 12 hours in the department (9 hours rural sociology), 6 hours of sociological theory, 3 hours of research methods and 3 hours of statistics are required. Each student must successfully complete a final oral examination.

Non-Thesis Option
A minimum of 36 hours of graduate coursework is required. At least 30 hours must be in courses numbered at or above the 500 level. The program must include a minimum of 21 hours in agricultural economics and 6 hours of quantitative methods. The agribusiness concentration, 6 hours of internship are required. In the agricultural economics concentration, 6 hours of economic theory are required. Each student must successfully complete both written and oral comprehensive exams.

Minor
A minor will include 6 hours of coursework in the department, with at least 3 hours in 500- or 600-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.

THE DOCTORAL PROGRAM

A minimum of 78 hours of graduate credit beyond the B.S. degree, including 24 hours of dissertation research, but excluding any master's research credit, is required. A minimum of 27 hours of coursework in agricultural economics, 15 hours of economic theory, and 9 hours of quantitative methods are required. The program must include a minimum of 9 hours in courses numbered at or above the 600 level (excluding dissertation credits). Qualifying exams are required in macroeconomics and microeconomic theory. Comprehensive exams include three written exams and one oral exam. The written exams are in general agricultural economics, quantitative methods, and the area of concentration.

Minor
A minor will consist of a minimum of 9 hours of coursework taken in the department and approved by the minor professor. At least 6 hours of credit in the minor area must be in 500- and 600-level courses.

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) Micro-finance, financial objectives, acquisition of debt and equity funds, capital investments, capital allocation, credit analysis, borrower and lender loan application analysis, insurance strategies, computer applications, and sources of agricultural credit. Prereq: Introductory Economics. Sp

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

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

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

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

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

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

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

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

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

525 Agribusiness Operations Research Methods (3) Applications of operations research methods and concepts for agribusiness. Theoretical background and applications characteristics of techniques used in agribusiness. Prereq: Basic Calculus and Statistics. F

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

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

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

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

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

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

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

620 Advanced Quantitative Methods (3) Discussion and evaluation of advanced statistical and mathematical techniques in current agricultural economics research. Prereq: 522, 524, and Economics 681-82, or consent of instructor. Sp, A

640 Agricultural Supply Analysis (3) Critical evaluation of both theoretical bases and empirical procedures used for estimating agricultural supply relationships using regression techniques, production functions, mathematical programming, firm growth models, and simulation in supply analysis. Prereq: 540 or consent of instructor. F, A

652 Consumer Demand and Food Consumption (2) Simultaneous consumer decision making; food demand; Constraints on demand. Complete demand system models. Prereq: Economics 511 and 512 or consent of instructor. Sp, A

670 Seminar in Natural Resource Economics (2) Issues in natural resource economics. Current literature: evaluation of theory, methodology and public policy as related to allocation of natural resources. Prereq: 570 or consent of instructor. Su, A

Rural Sociology

GRADUATE COURSES

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

580 Advanced Rural Sociology (3) Application of sociological concepts and theory to analyze changing structure and function of rural life in U.S. and developing countries. Demographic changes, rural social and community indicators, and rural development processes. Prereq: 380 or equivalent. (Same as Sociology 580). Sp

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

Agriculture

(3) College of Agricultural Sciences and Natural Resources

GRADUATE COURSES

507 Professional Development Seminar (1) Planning and executing graduate research programs; ethics and professionalism; graduate program procedures and resources. (Same as Biosystems Engineering 507). Biosystems Engineering Technology 507. Animal Science 507. Ornamental Horticulture and Landscape De-
Animal Science

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

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

Kelly Robbins, Head

Professors:
Barth, K. M. (Emeritus), Ph.D. ..... Rutgers
Bell, M. C. (Emeritus), Ph.D. ..... Oklahoma State
Bietker, J. K. (Emeritus), Ph.D. ..... Ohio State
Chamberlain, C. C. (Emeritus), Ph.D. ..... Iowa State
Eiler, H. D. (Emeritus), Ph.D. ..... Illinois
Erickson, B. H. (Emeritus), Ph.D. ..... Kansas State
Godkin, J. D. (Liaison), Ph.D. ..... Massachusetts
Hall, O. G. (Emeritus), Ph.D. ..... Iowa State
Hansard, S. L. (Emeritus), Ph.D. ..... Florida
Henry, R. W. (Emeritus), Ph.D. ..... Ohio
Lidvall, E. (Emeritus), Ph.D. ..... M.S.
Masinacu, F. B. (Emeritus), Ph.D. ..... Kansas State
McDonald, T. P. (Emeritus), Ph.D. ..... Tennessee
McLaren, J. Be/G. (Emeritus), Ph.D. ..... Auburn
Miller, J. K. (Emeritus), Georgia
Murphee, R. L. (Emeritus), Ph.D. ..... Wisconsin
Oliver, S. P., Ph.D. ..... Ohio State
Richardson, D. O., Ph.D. ..... Ohio State
Robbins, K. R., Ph.D. ..... Illinois
Saxton, A., Ph.D. ..... NC State
Shirley, H. V. (Emeritus), Ph.D. ..... Illinois
Schultz, T. W., Ph.D. ..... Tennessee
Sims, M., H., Ph.D. ..... Auburn
Tugwell, R. L. (Emeritus), Ph.D. ..... Kansas State

Associate Professors:
Backus, W. R., Ph.D. ..... Tennessee
Bell, R. R., Ph.D. ..... NC State
Grizzle, J. M., Ph.D. ..... Florida
Heimann, R. N., Ph.D. ..... Maine
Kattess, H. G., Ph.D. ..... VPI
Mendis-Handagama, L. C., D.V.M., Ph.D. ..... Monash
Smith, M. Q., Ph.D. ..... Oklahoma State
Waller, J. C., Ph.D. ..... Nebraska

Assistant Professors:
Mathew, A. G., Ph.D. ..... Purdue
Schrick, F. N., Ph.D. ..... Clemson
Smalling, J. D., Ph.D. ..... Texas A&M

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 nutrition, breeding, physiology (reproductive, mammary, and metabolic), and management with orientation towards beef cattle, dairy cattle, swine, and poultry. Since the department is also a part of the College of Veterinary Medicine, the areas of anatomy, systemic physiology (blood, cardio-respiratory, and neural), and histology are also available. The Ph.D. program offers concentrations in animal nutrition, animal breeding, animal physiology, animal anatomy, and animal management. For specific information, contact the department head.

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

THE MASTER'S PROGRAM

For admission to the M.S. program, a student must have obtained a 3.0 grade-point average on a 4.0 scale (or a 2.0 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 coursework 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 chairman of the committee, and a minimum of two other faculty members, one of whom may be outside the Animal Science Department. The advisory committee approves the student's coursework and research problem and determines if there is enough evidence of competence to proceed. The advisory committee approves the student's coursework and research problem and determines if there is a sufficient body of knowledge to proceed. The committee approves the student's coursework and research problem and determines if there is a sufficient body of knowledge to proceed. The committee approves the student's coursework and research problem and determines if there is a sufficient body of knowledge to proceed.

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 doctoral program must include:

1. A minimum of 16 hours in related fields outside of animal science.
2. At least 24 hours credit at the 500 and 600 level, exclusive of doctoral research and dissertation. The 48 hours of coursework must include:

   - At least 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. The 48 hours of coursework must include:

3. A minimum of 1 hour of Agriculture 512 in addition to that required at the M.S. level.
4. A minimum of 6 hours in 400-, 500-, or 600-level statistics courses approved for the ICGSP.

A minimum of five faculty members will constitute the student's advisory committee, of which at least one must be outside Animal Science. The major professor will be the chairperson.

The student and the major professor select a program of study depending on the student's area of concentration and professional goals. The advisory committee approves the coursework and the dissertation research proposal and determines if there is enough evidence of competence to proceed. 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 ovaries, spermatozoa, and embryos; application of methods of artificial insemination and embryo transfer to swine, cattle, and sheep; ovulation and embryo necrosis; and dam evaluation; pregnancy determination; gestation and parturition; infertility; recent advances in theriogenology. Prereq: 320 or equivalent. 1 hr and 2 labs.

430 Advanced Ration Formulation (2) Advanced ration formulation for beef and dairy cattle, sheep, horses, swine, poultry, laboratory, zoo, and companion animals. Mathematics, computer and statistical analysis in formulating complex rations. Prereq: 330 or equivalent and introductory computer science course. 2 labs.

440 Advanced Animal Breeding (2) Computer simulation of genetic improvement for multiple traits in swine, beef, and dairy cattle; evaluation of alternative breeding strategies, industrial programs in swine, poultry, beef, and dairy cattle; breed development, improvement, and utilization. Prereq: 340 or equivalent. 1 hr and 1 lab.

481 Beef Cattle Production and Management (3) Integration of principles of nutrition, breeding, physiology, and marketing into complete production and management programs. Structure of industry, enterprise establishment, systems of production, 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.

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.
of production responses and economic returns. Prereq: Completion of 500-level core courses or equivalent or consent of instructor. 2 hrs and 1 lab. F

486 Lamb and Wool Production and Management (3) Integration of principles of selection, nutrition, breeding, physiology, and marketing into complete lamb and wool production enterprises. Prereq: Prerequisites and 507, 509, 515, and 526. 2 hrs and 1 lab. S

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

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

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

509 Scientific Communication (1) (Same as Agriculture 509, Ornamental Horticulture and Landscape Design 509, and Plant and Soil Sciences 509.) S/NC only. F

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


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

530 Animal Nutrition and Metabolism (4) Comparative digestive physiology, digestion, absorption and metabolism of nutrients in ruminal and non-ruminal species. Concepts and methodologies of animal growth and nutrient requirements; interrelationships, availability and deficiencies of nutrients. Prereq: Animal Nutrition, Prerequisites, and Ration Formulation or consent of instructor. F

531 Analytical Techniques in Animal Science (3) Principles, concepts and methods applied to characterization and mechanistic studies of cells, organelles and biologically active molecules. Demonstration of methodologies: nutritional analyses, histology and ultrastructural morphology, immunology, competitive binding assays, protein biochemistry and molecular biology. Prereq: Organic Chemistry and Lab equivalent: 1 hr and 2 labs. S/NC only. Sp

535 Ruminology (2) Anatomy, physiology, and microbiology of rumen ecosystem; microbial fermentation and metabolism of polysaccharides, lipids and nitrogen. Prereq: 533 or consent of instructor. Sp

539 Nutritional Aspects of Companion Animal Health (2) Nutritional concepts applied to veterinary management of normal and disease states for pets including dogs, cats, horses and exotic species. (Same as Comparative and Experimental Medicine--Veterinary Medicine 539.) Sp

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

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

554 Comparative Hematology (3) Morphology, physiology and development of blood and blood forming organs; similarities and differences of major domestic and laboratory species. Prereq: Undergraduate physiology and/or consent of instructor. 2 hrs and 1 lab. (Same as Comparative and Experimental Medicine--Veterinary Medicine 554.) Sp, A

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: Prerequisites and 571 or equivalent; knowledge of software package on micro- or mainframe computer. (Same as Plant and Soil Science 571.) Sp

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

581 Advanced Livestock Management (3) Objective functions to evaluate alternative livestock production management policies. Systems approach to analysis and integration of reproductive management programs, genetic improvement policies, alternative feeding systems, and herd health programs. Consideration of time, risk, and uncertainty in livestock production. Tools: linear programming, as aid in decision-making and resource allocation. Prereq: Management, economics, computer science, statistics. 2 hrs and 1 lab. Sp

596 Seminar (1) Advanced topics in animal science. Required for students majoring in Agricultural Sciences. May be repeated. Maximum 4 hrs. S/NP only. F, Sp

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

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

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

633 Advanced Mineral-Vitamin Nutrition (4) Chemical forms, digestion, absorption, intermediary metabolism, deficiencies, excesses and interaction of minerals and vitamins. Prereq: 533 or 534, and Biochemistry and Cellular and Molecular Biology 410 or Nutrition 511 or consent of instructor. Sp, A

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

653 Advanced Mineral-Vitamin Nutrition (4) Chemical forms, digestion, absorption, intermediary metabolism, deficiencies, excesses and interaction of minerals and vitamins. Prereq: 533 or 534, and Biochemistry and Cellular and Molecular Biology 410 or Nutrition 511 or consent of instructor. Sp, A

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

672 Disorders of the Endocrine System (2) Pathological and physiological consequences of endocrine glands and organs of various animal species. Prereq: 521 or consent of instructor. (Same as Comparative and Experimental Medicine--Veterinary Medicine 672.) E

Simek, Jan F., Ph.D. .................. SUNY Binghamton
Wheeler, Margaret C. (Emeritus), Ph.D. ...... Yale

Associate Professors:
Harrison, Ira E., Ph.D. .................. Syracuse
Howell, Benita J., Ph.D. ............... Kentucky
Kongsberg, Lyle, Ph.D. .......... Northwestern
Kramer, Andrew (Liaison), Ph.D. ...... Michigan
Schroedl, Gerald F., Ph.D. ........... Washington State

Assistant Professor:
Marks, Murray K., Ph.D. .............. Tennessee

Research Associate Professor:
Chapman, J., Ph.D. ...................... North Carolina
Simek, Jan F., Ph.D. .................. SUNY Binghamton
Wheeler, Margaret C. (Emeritus), Ph.D. ...... Yale

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 graduate program.

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, geography) will be considered only if they have a formal minor in anthropology or its equivalent (at least five upper division anthropology courses).

All prospective M.A. students must make formal application to The University of Tennessee, Knoxville Graduate School. Copies of the application form, transcripts, and scores that are sent to The Graduate School should also be sent directly to the Department of Anthropology at the same time. In addition, the department requires a letter of intent from the applicant indicating career goals and reasons for selecting the University of Tennessee, three letters of recommendation, and one sample of the prospective student's written work (a class paper or research report); these materials should be sent directly to the Graduate Department, Secretary, Department of Anthropology, SSH 250, University of Tennessee, Knoxville, TN 37996-0720.

Graduate applications are considered once a year by the Graduate Committee. All application materials must be received in the Department by January 15 for admission the following Fall. Because of the structure of first-year studies, M.A. students should plan to begin their studies in the Fall semester.

M.A. Requirements

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

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

2. A minimum of 32 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 as the final examination in each core class (during regularly-scheduled final periods) and are graded by all faculty within the appropriate subdiscipline for each course. At the end of the first year, all M.A. students will be evaluated by the entire faculty and will either be retained or dropped from the program based on their first year's performance and GEE scores.

4. All M.A. students must attend the graduate section of the visiting lecturer program. To insure compliance with this requirement, each student is required to register for one credit hour of Anthropology 501 in the Fall semester of each year and fulfill all requirements for the course defined by the instructor. Materials covered by visiting lecturers may appear on the GEE.

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

6. In the second year of the program, students pursue their concentration area and undertake thesis research. Coursework will be determined through consultation with the student's advisor through a 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 thesis during the Spring semester of their second year.

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

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

THE DOCTORAL PROGRAM

In addition to The Graduate School requirements, requirements for the Ph.D. degree 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 UTK who are conditionally accepted into the Ph.D. program can enroll as doctoral students the semester following conferral of the M.A. degree. Students holding Master's degrees from other institutions must apply by January 15 for admission the following Fall and must begin their studies in the Fall semester.

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

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

1. Acceptance of a Master's degree in anthropology; or
2. Acceptance of a Master's degree in another discipline, with the provision that the student will follow the first-year program with entering M.A. students, i.e., complete the core courses (510, 560, 590) and pass the Graduate 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 have agreed upon the specific fields of specialization, this agreement will be examined, a brief delineation of the fields by the student, approved by the members of the committee, is presented to the department head and the student's major professor. As early as possible, but no later than a full semester after admission to candidacy, the student shall formally present a written dissertation proposal to the department head and advisor.

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

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

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

1. Successful performance on a language examination administered by the appropriate language department. A student electing this alternative should consult with the advisor.
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 foregoing 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 committee. All three sections must be taken within seven consecutive days.

2. Comprehensive Oral Examination: This examination follows shortly after successful completion of the comprehensive written exam. The major professor acts as chairperson of the committee.

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

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

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

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The M.A. program in Anthropology is available to residents of the states of Louisiana (concentration in zoarchaeology only), Virginia (concentration in zoarchaeology or cultural anthropology), or West Virginia. The Ph.D. program is available to residents of Alabama, Louisiana, Mississippi, or West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

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.

411 Linguistic Anthropology (3) Basic linguistic concepts applied to research in cultural anthropology; investigation of relationships between language and culture. Prereq: 130 or Linguistics 200. (Same as Linguistics 411.)
412 Folklore in Anthropology (3) Introduction to anthropological study of folklore, using folklore and folk theory in making cultural analysis of tribal, peasant, and complex societies. Prereq: 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 systems and use of anthropological methods of analysis. Prereq: 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. Relationships between actors (individuals) and structures. Encapsulation of traditional political forms and systems within modern states. Prereq: Cultural Anthropology or consent of instructor.

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

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

440 Cultural Ecology (3) Concepts and methods in studying dynamic interaction between prehistoric and present day cultures and their environments: ecological, economic, and social relationships. Prereq: consent of instructor. 3 hrs and 1 lab.

450 Principles of Zoological Archaeology (3) Basic biological principles of zoology and the application of biological analysis to the study of prehistoric human behavior. Prereq: 120 or consent of instructor. 3 hrs and 1 lab.

453 Rise of Complex Civilizations (3) Development of complex societies in Old World from origins of agricultural and exchange through beginnings of settled life. Paleolithic and Mesolithic chronology and lifeways. Prereq: 120 or consent of instructor.

478 Anthropological Genetics (3) Application of population genetics to the study of humans. The relationship between genetic and cultural variation and process. Prereq: Consent of instructor. 3 hrs and 5 labs.

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


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

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 development planning. Prereq: Consent of instructor. 3 hrs and 1 lab.

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

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

521 Seminar in Zoological Archaeology (3) Approaches to analysis and interpretation of faunal remains. Identification, collection, and analysis of major faunal remains. Prereq: Consent of instructor. 3 hrs and 1 lab.

522 Seminar in Archaeology (3) Theoretical and practical issues in contemporary archaeology: theory, practice, and application. Prereq: Consent of instructor. 3 hrs and 1 lab.

530 Fieldwork in Archaeology (3-8) Practicum in surveying, excavating, processing, and analysis of archaeological data. Prereq: Consent of instructor. 3 hrs and 1 lab.

530 Fieldwork in Archaeology (3-8) Practicum in surveying, excavating, processing, and analysis of archaeological data. Prereq: Consent of instructor. 3 hrs and 1 lab.

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

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

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

510 Method and Theory in Cultural Anthropology (3) Development of primary theoretical orientations by cultural anthropologists; formulation of research problems and design of field research projects. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

512 Urban Studies in Anthropology (3) Process of urbanization examined cross-culturally; theory and method in researching urban communities; urban problems and applied anthropological methods. Prereq: Consent of instructor. 3 hrs and 1 lab.

513 Rural Studies in Anthropology (3) Theory, method, and ethnographic research on selected problems and aspects of traditional agrarian groups in U.S. and peasant societies. Prereq: Cultural Anthropology or consent of instructor. 3 hrs and 1 lab.

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

521 Seminar in Zoological Archaeology (3) Approaches to analysis and interpretation of faunal remains. Identification, collection and analysis of major faunal remains. Prereq: Consent of instructor. 3 hrs and 1 lab.

522 Seminar in Archaeology (3) Theoretical and practical issues in contemporary archaeology: theory, practice, and application. Prereq: Consent of instructor. 3 hrs and 1 lab.

530 Fieldwork in Archaeology (3-8) Practicum in surveying, excavating, processing, and analysis of archaeological data. Prereq: Consent of instructor. 3 hrs and 1 lab.

530 Fieldwork in Archaeology (3-8) Practicum in surveying, excavating, processing, and analysis of archaeological data. Prereq: Consent of instructor. 3 hrs and 1 lab.

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

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

Admission Requirements

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

For Track 1 applicants, a bachelor's degree with a 3.0 GPA from a regionally accredited college or university is required. International applicants must have an equivalent 4-year degree and a 3.0 GPA. Candidates with a GPA less than 3.0 may be considered for conditional admission when evidence of exceptional promise is identified. Submission of a portfolio with a separate application to Architecture is required. A personal on-site interview is desirable but not mandatory.

For Track 2 applicants, a Bachelor of Architecture degree from a NAAB accredited program, or foreign equivalent. Candidates with a GPA less than 3.0 may be considered for conditional admission when evidence of

Degree Requirements

Track 1 requires a minimum of 42 semester hours of undergraduate preparation and 60 semester hours of graduate coursework, taking approximately 3 1/2 years of full-time study. A minimum of 4 hours of architectural electives or approved electives from another discipline must be taken at the 500 level or above.

Track 2 requires a minimum of 30 semester hours of graduate coursework.

Both tracks require 6 hours of Thesis 600 with a public presentation and oral defense of the thesis. Retention in the program is contingent upon evidence of satisfactory progress toward the degree. Each student's progress will be reviewed each semester by the Graduate Program Head. Any questions regarding progress will be reviewed by the Graduate Program Advisory Committee

For further information, contact the School of Architecture.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The M.Arch program in Architecture is available to residents of the state of Kentucky.

Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

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.


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

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

412 Non-Western & Indigenous Architecture (3) Building responsive to climate, material availability, and economic level, as designed by anonymous builders. Pre-historic times to present throughout world. Pre-Hispanic times in the New World. Ancient cities. Prehistoric to present world. Pre-Hispanic times in the New World. Ancient cities.

413 Tennessee Architecture (3) History of settlement patterns and building in Tennessee. Reading assignments, lectures, discussion, and field trips. Historical research using primary material.

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

415 Medieval Architecture (3) History of architecture from decline of Rome to beginning of Renaissance.


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


420 American Architecture, 1840-1940 (3) Stylistic periods from Gothic Revival through twentieth century.

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

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

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

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

433 Computer Applications in Design III (3) Integration of three-dimensional modeling and technical analysis using computer to augment building design and independent studies under faculty direction. Prereq: Consent of instructor. Sp


444 Advanced Environmental Control Systems (3) In-depth analysis and innovative concepts in design of heating, ventilating, and air conditioning. Prereq: 341.

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

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

484 Project and Construction Management (3) Principles, methods, and applications of project and construction management in the building process. Project manager's and construction manager's functions, responsibilities, and activities investigated through case studies. Methods and theories of estimating project cost and building cost in current practice. New techniques of cost analysis.


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

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

502 Registration for Use of Facilities (3-15) Required. May be repeated. Maximum 12 hrs. E
511 Environmental Influences (3) Environmental factors which influence regional character of architecture. Natural forces, together with these factors, cultural interpretation and response regarding importance and impact.

512 Technological Traditions (3) Technological aspects influencing building form. Role of technical aspects of structural, environmental and building infrastructure as integrated systems supporting access use and expression of building.

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

514 Ethical Imperatives (3) Social, cultural, philosophical and moral issues which impact professional responsibilities. Attitudes, values, and ideas that address formation of professional ethics.

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

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

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

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

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

551 Research Methods (3) Quantitative and qualitative methods of research in architectural inquiry. Systematic study and application of applied and speculative investigations in field of architectural research. Review and identification of techniques and methodologies and applications for architectural research and scholarship.

553 Advanced Topics in Architectural Technology (3) In-depth investigations and analysis: architectural technology lighting, structure, enclosure, mechanical and other architectural technologies. Prereq: Consent of instructor.

562 Professional Practice (3) Management and organizational theories and practices for delivering professional design services: assessment of building industry and its influence on practice; analysis of basic management functions within professional firms; legal and ethical concerns facing practitioners today; and introduction to special obligations and privileges of design professional.

571 Architectural Design Studio/Seminar I: Environmental Forces (6) Environmental factors influencing regional character of architecture. Examination of associated natural forces and cultural interpretation. Readings and discussions; application in design studio to specific projects. Prereq: Principles in Architectural Design 1 hr and 5 labs.


573 Architectural Design Studio/Seminar III: Cultural Aesthetics (3) Role of cultural influences on architectural form. Investigations into relationships between place and culture and impact on architectural character. Analysis and design with urban context. Readings and discussions; process of formal synthesis in design studio. Prereq: 572. 1 hr and 5 labs.


591 Foreign Study (1-9) Off-Campus Study (1-9)

593 Independent Study (1-9)

Art
(College of Arts and Sciences)

MAJOR

DEGREE

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

Norman Magden, Head

Professors:
Blain, Sandra J., M.F.A. ................. Wisconsin
Brake, P. M., M.F.A. ......................... Yale
Clarke, R. A. (Emeritus), M.S. .......... Wisconsin
Cleaver, Dale G. (Emeritus), Ph.D. .... Chicago
Dahmert, R. H. (Emeritus), M.F.A. .. Wisconsin
Darrow, J. F., Ed.D. ......................... Illinois State
Falsini, Joseph S. (Emeritus), M.S. .... Ohio State
Goldstein, M. B., M.F.A. ................. Nebraska
Kendall, William C., M.F.A. .......... Wisconsin
Lee, B., M.F.A. ............................... Yale
Leland, W. E., M.F.A. ..................... Tennessee
Livingston, P. R., M.F.A. ............... Wisconsin
Lyons, B. (Liaison), M.F.A. ............ Arizona State
Magen, Norman, Ph.D. .................. Case Western Reserve
Martinson, Fred, Ph.D. ..................... Chicago
Miller, Sue, M.F.A. ......................... Michigan State
Moffatt, F., Ph.D. ............................ Chicago
Peacock, D., M.F.A. ....................... Iowa
Riesing, T. J., M.F.A. ...................... Nebraska
Stewart, F.C., M.F.A. ...................... Claremont
Yates, S., M.F.A. ......................... North Carolina (Greensboro)

Associate Professors:
Habel, Dorothy, Ph.D. .................... Michigan
Hilks, Timothy, Ph.D. .................... Penn State
Lefevre, Richard (Emeritus), M.F.A. .... Rochester IT
Longobardi, Pam, M.F.A. .............. Pennsylvania
Neff, A., Ph.D. ............................... California
Staples, Carolyn, M.F.A. ............... Michigan State
Wilson, D., M.F.A. ........................... California (San Diego)

Assistant Professor:
Brogden, Sally B., M.F.A. ............ NY State College of Ceramics (Alfred)
Everson, Kevin, M.F.A. ................. Ohio State

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

THE MASTER'S PROGRAM

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

1. A detailed letter of intent including statement requesting assistantship, if desired.
2. Two 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 Department of Art.

M.F.A. Requirements

A minimum of 60 hours is required:

1. Successful completion of 20 hours of studio in a concentration area. An inter-area program must be approved by the graduate faculty only after the second semester in residence. Ten hours of concentration must be in second year courses (512, 514, etc.)
2. A minimum of 9 hours of art history for graduate credit.
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.
5. A student with the permission of the area faculty may petition to take 3 hours of outside academics as a substitute for 3 hours of art history or 3 hours of concentration area. The petition is to be presented to the graduate committee for final approval and must directly address the need and relevance of this substitution to the student's concentration.

Four semesters (normally the first 40 hours) beyond the Bachelor's degree are required in residence. An exception is made for working professionals who may complete their first 20 hours, with the permission of the faculty, on a part-time basis. Residence is defined by the Department of Art as (1) a minimum enrollment of 6 hours per semester and (2) use of Department 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 599. The committee must consist of one faculty member from the candidate's concentration area (designated as chairperson) and a faculty member from outside the concentration area. The inclusion of an Art History faculty member on each committee is encouraged.

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

Academic Standards

1. First-year evaluation: At the end of the first 2 semesters in residence, the student must present a portfolio for evaluation by the faculty and receive permission to continue in the program.
2. Second-year evaluation: With completion of all coursework, the student must present work for evaluation by the faculty and receive permission to register for Projects in Lieu of Thesis.
3. If, in a review by the student's major area faculty, the student's progress is deemed insufficient, the faculty may recommend a work
period without advancement toward the degree, probation with specific goals set for a specific time, or dismissal.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The M.F.A. program in Art is available to residents of the states of Alabama (concentration in watercolor only) or Arkansas (concentration in graphic design only). Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE MINOR IN THE HISTORY OF ART

A graduate minor in Art History may be arranged with consent of the student's committee, the instructors involved, and The Graduate School. Prerequisite is an undergraduate Art History minor, or its equivalent, and reading knowledge of French, German, or Italian, unless waived by the Art History faculty.

Art

GRADUATE COURSES

481 Museology I: Museums, Purpose and Function (3) Development of museums of art, history, natural and applied science. (Same as Anthropology 481.)

482 Museology II: Exhibition Planning and Installation (3) Exhibition concept development and implementation. Exhibition design and installation techniques. Publicity, production, matting and framing, shipping and storage. Prereqs: 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 or off campus. Prereqs: 481 and 482. May be repeated. Maximum 12 hrs.

499 Special Topics (1-3) Student- or instructor-initiated course offered at convenience of department. Prereq: Determined by department. May be repeated. Maximum 12 hrs.

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

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/N 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.

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 Drawing

GRADUATE COURSES

411 Drawing IV (6) Individualized pursuit of personal drawing techniques and concepts: supplemented by individual and group critiques; weekly life drawing sessions. Prereq: 311. May be repeated. Maximum 12 hrs.

419 Special Topics in Drawing and Painting (3) Studio course offered at convenience of department. Prereq: Determined by department. 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.

595 Visiting Artist Seminar (2) Contemporary art issues by different visiting artists. May not be used toward art history requirement. May be repeated. Maximum 8 hrs.

599 Projects in Lieu of Thesis (10) Prereq: All graduate course work and successful second year evaluation by graduate faculty. May be repeated. Maximum 20 hrs. S/N only. E

Art Design/Graphic

GRADUATE COURSES


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.


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 prearrangement with department. Prereq: Senior standing and consent of instructor. May be repeated. Maximum 12 hrs.

458 Special Topics in Graphic Design (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Determined by department. May be repeated. Maximum 6 hrs.

551 Graphic Design II (2-6) May be repeated. Maximum 10 hrs.

552 Computer Enhanced Design (2-6) Prereq: Consent of instructor. May be repeated. Maximum 10 hrs.

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

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

595 Visiting Artist Seminar (2) Contemporary art issues by different visiting artists. May not be used toward art history requirement. May be repeated. Maximum 8 hrs.

599 Projects in Lieu of Thesis (10) Prereq: All graduate course work and successful second year evaluation by graduate faculty. May be repeated. Maximum 20 hrs. S/N only. E

Art History

GRADUATE COURSES

411 Art of Indian Asia (3) History of Indian art: Central Asia and Southeast Asia. Writing-emphasis course.

415 Chinese Art (3) Survey from pre-Shang Dynasty to contemporary movements in China, Taiwan, and Hong Kong. New discoveries. Writing-emphasis course.


425 Early Christian and Byzantine Art to 1350 (3) Art in Italy and the Eastern Empire from the beginnings of Christianity 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, 1350-1500 (3) From county 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, Rembrandt, and Italian Baroque developments in all media. Spanish Baroque painting and sculpture: Velázquez. Writing-emphasis course.

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, design, and film 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.


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

478 History of American Sculpture (3) American sculpture from prehistory to 1960's.

479 History of 20th-Century Art in Europe (3) From 19th century to present. 20th-century Europe and U.S. Prereq: 172 and 173.


481 Studies in Art History (3) Concentration in individually selected area. Prereq: 12 hrs of art history and consent of instructor. May be repeated. Maximum 6 hrs.

507 Studies in Medieval Art (3) Art and architecture of Middle Ages: major monuments from Byzantium or western Europe. Prereq: Determined by department. May be repeated. Maximum 6 hrs.

508 Studies in Italian Renaissance Art (3) Art and architecture of 14th, 15th, and 16th centuries in Italy. Early or High Renaissance or Mannerist periods. Prereq: M.F.A. candidate or consent of instructor. May be repeated with consent of department. Maximum 6 hrs.

509 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.

510 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.

511 Special Topics in Baroque Art (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 6 hrs.

512 Special Topics in History of Art (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.

Art Media Arts

GRADUATE COURSES


432 History of Film and Modern Art (3) Study of development and interaction between cinematic art and visual art within context of modern art history. Available for Art History credit. (Same as Cinema Studies 433.)

433 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 6 hrs.

434 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.

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


441 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. Prereq: History of Film and Modern Art or consent of instructor. May be repeated. Maximum 9 hrs.

593 Independent Study (1-10) Visual art with special emphasis. May be repeated. Maximum 10 hrs.

595 Visiting Artist Seminar (2) Special topics in art history and criticism. Prereq: Intermediate Seminar in Art History or consent of instructor. May be repeated. Maximum 12 hrs.

596 Special Topics in Drawing and Painting (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Determined by department. May be repeated. Maximum 12 hrs.

Art Printing

GRADUATE COURSES

461 Intaglio I (3-6) Exploration of individual projects through advanced color printing methods and combinations of other print media. Prereq: Intermediate Intaglio or consent of instructor. May be repeated. Maximum 12 hrs.

462 Intaglio II (3-6) Exploration of individual projects through advanced color printing methods and combinations of other print media. Prereq: Intermediate Intaglio or consent of instructor. May be repeated. Maximum 12 hrs.

463 Lithography I (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 I (3-6) Individual development of screen printing problems and techniques; development of image and conceptual concept. Prereq: Intermediate Screen Printing or consent of instructor. May be repeated. Maximum 12 hrs.

469 Special Topics in Printing (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Determined by department. May be repeated. Maximum 10 hrs.

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

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

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

564 Intaglio Painting 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.

565 Independent Study (1-10) Visual art with special emphasis. May be repeated. Maximum 10 hrs.

566 Intaglio Special Topics (3) Contemporary art issues by different visiting artists. Prereq: Independent Study or consent of instructor. May be repeated. Maximum 10 hrs.

599 Projects in Lieu of Thesis (10) Prereq: All graduate course work and successful second year evaluation by graduate faculty. May be repeated. Maximum 20 hrs. S/NC only. E.

Art Painting

GRADUATE COURSES

413 Painting IV (6) Individual concepts and personal expression with varied media. Prereq: 313. 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: Determined by department. 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.

595 Visiting Artist Seminar (2) Contemporary art issues by different visiting artists. Prereq: Independent Study or consent of instructor. May be repeated. Maximum 12 hrs.

599 Projects in Lieu of Thesis (10) Prereq: All graduate course work and successful second year evaluation by graduate faculty. May be repeated. Maximum 20 hrs. S/NC only. E.

Art Sculpture

GRADUATE COURSES

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

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

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

542 Graduate Sculpture II (2-6) May be repeated. Maximum 10 hrs.

593 Independent Study (1-18) See College of Arts and Sciences.
**Astronomy**

See Physics and Astronomy

**Audiology and Speech Pathology**

(Chair of Arts and Sciences)

**MAJORS**  

DEGREES

<table>
<thead>
<tr>
<th>Major</th>
<th>Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audiology</td>
<td>M.A.</td>
</tr>
<tr>
<td>Speech and Hearing Science</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Speech Pathology</td>
<td>M.A.</td>
</tr>
</tbody>
</table>

Patrick J. Carney, Head

Professors:

Asp, Carl W., Ph.D. .......... Ohio State  
Carney, Patrick J., Ph.D. .... Iowa  
Nabelek, Anna (Emeritus), Ph.D. .... Poland  
Nabelek, Igor V. (Emeritus), Sc.D. .... Prague  
Peterson, H. A. (Emeritus), Ph.D. .... Illinois  
Silverstein, B. (Emeritus), Ph.D. .... Purdue  
Wallace, Gloria Jean L., Ph.D. .... Northwestern

Associate Professors:

Burchfield, Samuel B., Ph.D. ...... Michigan State  
Ferrell, Charles J., M.A. ...... Tennessee  
Gordon, Pearl A., Ph.D. ...... Tennessee  
Krishnan, Ravi A., Ph.D. ...... Texas  
Thelin, J. W., Ph.D. .......... Iowa

Assistant Professor:

Erickson, Mary E., Ph.D. ...... Southern Cal  
Hedrick, Mark, Ph.D. ......... Vanderbilt  
McCullough, Gary .............. Vanderbilt  
Ruark, Jacki L., Ph.D. ........ Pittsburgh  
Swanson, Lori A,. Ph.D. ...... Purdue

**THE MASTER'S PROGRAM**

A major is offered in Audiology or in Speech Pathology. Admission to these graduate programs is competitive. Both of these graduate programs are accredited by the Council on Academic Accreditation in Speech-Language-Hearing and for Tennessee licensure as an audiologist or speech-language pathologist. The intent of each major program is to provide the student with the scholarly and professional skills necessary for functioning as an independent professional clinician in any clinical environment.

Students majoring in either of the two areas must meet the academic and practicum requirements for clinical certification of the American Speech-Language-Hearing Association and for Tennessee licensure as an audiologist or speech-language pathologist. An exception to this rule must be approved by the appropriate departmental committee. Enrollment in clinical practicum courses is required for all clinical practice experiences. If the under-graduate preparation does not include sufficient coursework in speech pathology, audiology, psychology, and related fields, the student may be required to make up such deficiencies.

Students may elect either the thesis or non-thesis option. Students in both programs are required to take 511. The master's program with thesis will include a minimum of 30 semester hours of approved graduate credit in speech/language pathology or a minimum of 33 semester hours of approved graduate credit in audiology, including 6 hours of 500 credit in the preparation of an acceptable thesis representing original independent work and a final oral examination. At least two-thirds of these total hours must be at the 500 or 600 level, including no more than 6 hours of thesis and no more than 8 hours of practicum. Students in the non-thesis option program must present a total of 36 semester hours in the speech/language pathology program or 39 semester hours in the audiology program of approved graduate credit and pass a final written examination.

**THE DOCTORAL PROGRAM**

The Ph.D. program in Speech and Hearing Science seeks to develop individuals for professional careers in a variety of positions including research and college teaching in the concentration areas of speech and language pathology, audiology, speech-language science or hearing science. The degree program is research oriented with primary emphasis on processes involved in normal, deviant, or disordered speech, language and hearing. Students will be expected to demonstrate their knowledge in areas related to the

concentrated field of study. These areas include:

1. Basic speech, hearing, or language processes;
2. Basic speech, hearing, or language disorders or differences;
3. Related disciplines providing insight into human communication processes;
4. Technical skills in instrumentation and experimental design which enable the student to investigate problems pertaining to speech and hearing processes.

The program will normally consist of three or more calendar years of graduate study beyond the master's degree with the first year being devoted primarily to formal coursework and the last year to full-time research culminating in the doctoral dissertation.

The total program is a minimum of 60 semester hours, including a minimum of:

1. 24 semester hours in dissertation 600.
2. 6 semester hours in a research tool.
3. 6 semester hours in a cognate area outside the department.
4. 24 semester hours in 600-level coursework within the department of which:
   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.

**ACADEMIC COMMON MARKET**

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The M.A. program in Audiology is available to residents of the state of South Carolina. The Ph.D. program in Speech and Hearing Science is available to residents of the states of Alabama, Arkansas, Kentucky, or West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

**GRADUATE COURSES**

431 Stuttering (3) Nature, appraisal and treatment. Prereq: 304 or consent of instructor.

433 Observation of Clinical Practice (1) Prereq: Speech and Language Development, Articulation Disorders, or consent of instructor.

434 Clinical Practice in Speech-Language Pathology I (1-4) Prereq: 433 and consent of instructor. Enrollment for fewer than 2 hrs must have prior departmental approval.


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

461 Introduction to Language Pathology in Children (3) Nature, etiology and treatment of language retardation in children; observations of language therapy. Prereq: 320 or consent of instructor.

473 Audiology II (3) Basic principles of clinical audiology; pure tone, speech, masking and overview of special auditory tests. Prereq: 371.
576 Electro Audiological Assessment of Auditory Function (3) Auditory assessment and analysis of auditory function in normal and impaired individuals. Prereq: 473, 507, 546, or equivalents or consent of instructor.

577 Vestibular Disorders (3) Anatomy, physiology, and pathology of vestibular system. Prereq: Consent of instructor.

580 Speech and Language Services in School (3) Organization and implementation of speech and language programs in schools. Prereq: Consent of instructor.

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

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

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

594 Advanced Aural Habilitation/Rehabilitation of the Hearing-Impaired (3) Study of hearing loss, rehabilitation, and treatment of hearing impaired adults and children. Prereq: 507, 547, or consent of instructor.

600 Doctoral Research and Dissertation (3-15) P/NP only. Prereq: Consent of instructor.

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

602 Psychosocial Concepts (3) Psychoacoustics and perception of noise and speech stimuli. Prereq: Consent of instructor.

603 Language Science (3) Seminar on theories and paradigms of research on acquisition and use of language: phonology, syntax, semantics, and pragmatics. Prereq: Graduate standing and consent of instructor.

607 Advanced Anatomy and Physiology of the Ear (3) Anatomical and physiological correlates of hearing sensitivity. Prereq: Consent of instructor.

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

610 Seminar in Hearing Science (2) Advanced study of perception of speech and acoustic signal, detection, identification, and recognition. Prereq: 602 or consent of instructor. May be repeated. Maximum 6 hrs.

611 Experimental Design in Speech and Hearing (3) Analysis of experimental design in research and generation of experimental designs. Prereq: Consent of instructor.

626 Advanced Seminar in Neurologically-Based Communication Disorders (3) Topics vary. Prereq: 520, or consent of instructor. May be repeated. Maximum 6 hrs.
Aviation Systems

UT Space Institute

MAJOR

Aviation Systems ................................. M.S.

William D. Lewis, Program Chair

Professors:

Collins, F. G., Ph.D. ......................... California
Kimberlin, R. D., Ph.D. ............... RWTH (Germany)
Mason, A. A. (Emeritus), Ph.D. .... Tennessee
Paludan, C. T., Ph.D. ................. Denver
Wu, J. M. (Emeritus), Ph.D. ......... Cal Tech
Young, R. L. (Emeritus), Ph.D. .... Northwestern

Associate Professors:

Lewis, William D. (Liaison), Ph.D. ..... Georgia Tech
Solies, U. P., Ph.D. ..................... Tennessee

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, science, or an equivalent area of study 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. Course work completed at the undergraduate level must include a minimum of 20 semester hours of course work in the major field of engineering or science. Demonstrable experience or study in these areas must be presented with the application. An agreement among southern states for student transfers is in effect. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

Students in non-thesis programs are required to complete a minimum of 30 semester hours credit while the non-thesis program involves a minimum of 33 semester hours credit.

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.

NON-THESIS OPTION

The non-thesis program will be permitted in special circumstances and involves satisfactory completion of the following requirements:

Research and Development Specialization

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

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The M.S. program in Aviation Systems is available to residents of the states of Arkansas, Florida, Mississippi, Virginia, or West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

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

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 and developmental trends and developments pertinent to present status and future development of air transportation.

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


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, systems integration, standards and regulations, teamwork and decision-making process.

510 Special Topics in Aviation Systems (3) Current problems. Prereq: Consent of instructor. May be repeated with consent.


550 Project in Aviation Systems (3) Enrollment limited to Aviation System students in non-thesis programs. May be repeated. Maximum 2 hrs allowed toward degree.
MINOR DEGREES

Biochemistry and Cellular and Molecular Biology

John W. Koontz, Head

Professor:

Bagby, R. M., Ph.D. ... Illinois
Carlson, J. G. (Emeritus) (Distinguished Prof.), Ph.D. ... Pennsylvania
Chen, T. T., Ph.D. ... Florida
Churchich, Jorge E., Ph.D. ... Sheffield
Handel, Mary Ann (Distinguished Prof.), Ph.D. ... Kansas State
Hochman, Ben (Emeritus), Ph.D. ... California
Joel, K. W. Ph.D. ... London
Joshi, J. G. (Emeritus), Ph.D. ... Poona
Kennedy, J. R., Ph.D. ... Iowa
Liles, J. N. (Emeritus), Ph.D. ... Ohio State
MacCabe, J. A., Ph.D. ... California (Davis)
Monty, Kenneth J., Ph.D. ... Rochester
Roth, L. Evans (Emeritus), Ph.D. ... Chicago
Saló, T. P. (Emeritus), Ph.D. ... Michigan
Shivers, C. A., Ph.D. ... Michigan State
Welch, H. G. (Emeritus), Ph.D. ... Florida
Whitson, G. L. (Emeritus), Ph.D. ... Iowa
Wicks, Wesley D., Ph.D. ... Harvard

Associate Professors:

Ganguly, R., Ph.D. ... Nebraska
Hall, J. C., Ph.D. ... Illinois
Howell, Elizabeth E., Ph.D. ... Lehigh
Koontz, John W. (Liaison), Ph.D. ... Kentucky
McKee, B. D., Ph.D. ... Michigan State
Peterson, Cynthia B., Ph.D. ... LSU
Roberts, Daniel M., Ph.D. ... California (Davis)
Serpeu, Engin H., Ph.D. ... Hacettepe

Assistant Professors:

Bruce, Barry, Ph.D. ... California (Berkeley)
Prosser, R. A., Ph.D. ... Illinois

APPLICATIONS AND 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 physical chemistry. 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.
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, 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, 515-16 and 517.
2. At least two approved graduate courses in the life sciences or chemistry, or physics, or other physical science to be determined upon consultation with the mentor and the dissertation committee. No survey courses will be accepted.
3. At least 6 hours of topics offered in 615.
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 six semesters.
5. Comprehensive examination, taken before the end of the third year of study.
6. A dissertation reporting the results of original and significant research carried out during the term of candidacy.
7. A final oral examination which will be concerned primarily with the student's dissertation.

Petitioning for Master's Degree

Students who have passed the comprehensive examination in the Ph.D. program and have completed at least 30 hours of approved coursework for graduate credit, at least two thirds of which must be at or above the 500 level, may petition the department for award of a master's degree. The additional requirements for such a degree are:

1. 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 five faculty members appointed by the head of the department, at least two of whom shall be members of the department; or
2. Publication of at least one full-length paper in a major scientific journal as senior author.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The M.S. program in Biochemistry and Cellular and Molecular Biology is available to residents of the state of Kentucky. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES


410 Cellular and Comparative Biochemistry (4) Electrolytes, behavior, chemistry, structure, and function of proteins; free energy; conformational analysis; protein synthesis; and biochemical genetics; regulation of biochemical processes. Prereq: Organic Chemistry and General Biology. 3 hrs and 1 discussion. F, Sp.


421 Cell and Tissue Structure and Function (4) Study of animal cells and tissues at light and electron microscope levels. Prereq: Cell Biology. 2 hrs and 2 labs.


449 Laboratory in Physiology (2) Prereq or coreq: 440 or 445.

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

471-61 Biophysical Chemistry (3, 3) Physicalchemical principles with applications to biological systems. 471-Thermodynamics; chemical equilibrium; solution chemistry; transport; electrochemistry; kinetics; enzyme catalysis; resonating states; 461-Experimental Biophysical 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 471-61.) F, Sp.

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

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

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

511 Advanced Protein Chemistry and Cellular Biology (3) Cellular structure and function at the 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. (Same as Life Sciences 512.)

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, Sp.

515 Experimental Techniques 1 (4) Modern experimental methodology and instrumentation. Lab. cell growth; spectrophotometry; microscopy; nuclear acid purification; protein synthesis; membrane proteins; electrophysiology; computer analysis of nucleic acid and protein sequences. Lectures on theory of laboratory techniques to accompany two lab periods per week. Primarily for departmental graduate students. Prereq: Gen. Chem. of instructor. F

516 Experimental Techniques 11 (3) Laboratory rotations. Students work in laboratory of faculty member
clearly defined project. Written proposal and oral report. Prerequisites: departmental graduate students. Prereq: 515. Sp.

517 Physical Biochemistry (3) Physics and chemistry of biological systems and molecules. Thermodynamics; diffusion and transport; physical chemistry of macromolecules; enzyme kinetics; binding reactions; spectroscopy; electrophysiology. Prereq: 511 or consent of instructor. Sp.

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

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

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 organizational action of hormones in invertebrate and vertebrate animals. Prereq: 490 or consent of instructor. Recommended prereq: 410. 2 hrs and 1 lab. Sp.

560 Advanced Concepts in Structural Biology/Biochemistry (3) Concepts related to structural biology/biochemistry with information taken from current literature. Predominantly lecture format with student participation. Specific subject area to be announced. Prereq: Consent of instructor. May be repeated.

561 Environmental Toxicology (3) (Same as Ecology and Evolutionary Biology 561.)

562 Introduction to Electron Microscopy - Transmission Electron Microscope (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 516.) 2-3 hrs. Lab. Sp.

564 Introduction to Electron Microscopy-Scanning Electron Microscope (3) Practical introduction to techniques of electron microscopy and to scanning electron microscope. Use of microscope, introduction to darkroom techniques and digital image processing, preparation of samples for observation, and special project. Admission limited only to departmentally approved graduate students. (Same as Botany 516.) 2-3 hrs. Lab. Sp.

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. E


603 Graduate Research Colloquium (1) Seminars and lectures dealing with current advances in fields of biochemistry and biophysics. Mechanisms of enzyme catalysis, gene expression, membrane structure and function, metabolic regulation, physical biochemistry, molecular genetics, cell ultrastructure and physiology, and related topics. Required every semester in residence. S/NC only. F, Sp.

604 Current Topics in Environmental Toxicology (1) (Same as Ecology and Evolutionary Biology 504.) S/NC only. F, Sp.

605 Journal Club in Neurophysiology/Physiology (1) Readings and discussion based on current literature. May be repeated. Maximum 12 hrs. S/NC only.

606 Journal Club in Structural Biology/Biochemistry (1) Readings and discussion based on current literature. May be repeated. Maximum 12 hrs. S/NC only.

607 Journal Club in Cellular/Molecular Biology (1) Readings and discussion based on current literature. May be repeated. Maximum 12 hrs. S/NC only.


610 Current Topics in Biochemistry, Cellular, and Molecular Biology (1-2) Critical reviews of research problems and methods in biochemistry, cell biology, and/or molecular biology. Oral presentations, written reports, computer simulations by faculty and students. Prereq: Consent of instructor. May be repeated. Maximum 4 hrs.

611 Advanced Topics in Medical Science (Same as Comparative and Experimental Medicine - Graduate School of Medicine 611.)

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

Biomedical Sciences

(Office of the Vice Chancellor for Academic Affairs)

MAJOR

DEGREES

Biomedical Sciences .................................. Ph.D.

Raymond A. Popp, Director

Professor:

Olin, Donald E., Ph.D. ......................... Rockefeller
Popp, Raymond A., Ph.D. ...................... Michigan

Research Professor:

Olin, Ada L., Ph.D. ............................. New York

Assistant Research Professor:

Hausser, Loren, Ph.D. ....................... California (Irvine)

Shared faculty are drawn from the Oak Ridge National Laboratory.

The University of Tennessee-Oak Ridge Graduate School of Biomedical Sciences, ORNL, 1060 Commerce Park, Oak Ridge, Tennessee 37831.

THE DOCTORAL PROGRAM

1. Satisfactory (B grade or better) completion of the following core courses or their equivalent: Biochemistry (511); Biophysical Biochemistry (514); Genetics (515); Computing for the Life Sciences (525); and Survey of Statistical Methods (530).

2. Three semesters of Biomedical Sciences Laboratory (531-32-33).

3. Participation in at least one of the seminars during each term of residence after the first year is strongly recommended.

4. Satisfactory completion of formal advanced coursework in the areas of the student's interests. The number and nature of the required advanced courses will vary depending upon the student's background and area of specialization.

5. Passing both written and oral comprehensive examinations.

6. A dissertation reporting the results of original and significant scientific research. A minimum of 24 semester hours of coursework 600 is required.

7. A final oral examination on the dissertation.

8. A formal seminar presentation of the dissertation research.

GRADUATE COURSES

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

511 Biochemistry (3) Chemistry of carbohydrates, lipids, proteins, and coenzymes; enzyme kinetics intermediates; metabolic pathways and photosynthesis; biosynthesis of amino acids and lipids, and macromolecules.
514 Biophysical Biochemistry (3) Chemistry, metabolism, and energy of purines, pyrimidines, and nucleic acids; biosynthesis of RNA, DNA, and proteins. Energy levels and excited states of large molecules; optical instrumentation; adaptations to system perturbations; properties of macromolecules in solutions; molecular solution; molecular conformations; inter- and intramolecular forces; principles of microscopy. Prereq: 511.
515 Genetics (3) Mendelian genetics, mitosis and meiosis; transmission genetics; mapping and linkage; genetics of phage, bacteria and eucaryotes; mapping, linkage, mutagenesis; cytoplasmic inheritance. Mechanisms of recombination, chromosomal structure and replication.
525 Computing for the Life Sciences (3) Interactive computing, Mini- and micro-computing environments; Basic, Fortran, and/or Pascal languages; application of statistics, graphics, text manipulation, and computer communications.
530 Survey of Statistical Methods I (3) (Same as Statistics 531.)
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

401-02 Field Studies in Botany (1-3,1-3) Field experience and taxonomy of special plant groups. Topics vary: mycology, lichenology, pteridology, agrostology, mycology, physiological aquatic vascular plants, systematics, woody plants, and botanical photography. May be repeated under different topics. Maximum 9 hrs.

403 Plant Evolution (3) Evolutionary biology from plant perspective: Speciation, hybridization, polyphyletic, evolution of mating systems, phenotypic plasticity; comparison of characteristics of animal and plant systems. Lectures: paper-presentations on primary literature; current research in evolutionary ecology and genetics. Prereq: General Botany or Botany and Organization and Function of the Cell. (Same as Ecology and Evolutionary Biology 403.)

404 Plant Molecular Biology (4) Current research in plant molecular biology: techniques and procedures, Genome structure, gene synthesis, 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, data analysis and 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 2 labs. F,A

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.

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, at least two weekend field trips. Prereq: Field Botany or equivalent. (Same as Ecology and Evolutionary Biology 431.) Sp

431 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: Plant Tissue Culture; Introduction to Plant Physiology; Introduction to Microbiology and Lab; Plant Propagation; and Field and Forage Crops.

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

501 Mycology (4) Intensive survey of fungi, all major classes. Lecture, laboratory and field information. Occasional field trips. Prereq: 310, 3 hrs and 1 lab. Su,A

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

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

506 Phycology (4) Comparative study of major algae phyla, both freshwater and marine: morphological, developmental, ecological, taxonomic and phylogenetic as aspects, field and laboratory studies, identification, classification, experimentation. Prereq: 310 or consent of instructor. 3 hrs and 1 lab. F,A

507 Biological Illustration (3) Principles and applications of photography (B&W and Color) 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. F,A

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

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

580 Bryophytes and Pteridophytes (4) Taxonomy, phycology, ecology and developmental morphology; field studies and current research. Prereq: 310-20 or consent of instructor. 2 hrs and 2 labs. F,A

582 Methods and Instrumentation in Laboratory Investigation I (3) Project experience and theoretical background in various research methods, ion exchange resins, adsorption chromatography, disc electrophoresis, polargraphy, ionic and ultrasonic determination, gas chromatography, autoradiographs, microscopy, culture methods, use and detection of radiotopes. Prereq: Chemistry 350, 360; Physics 121, 122. May be repeated. Maximum 5 hrs. S/N only.

585 Methods and Instrumentation in Field Investigation I (1) Appropriate methods and instrumentation. Topics vary. May be repeated with consent of instructor. Maximum 5 hrs. S/N only.

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

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

635 Environmental Assessment and Sustainable Development in Third World Countries (3) (Same as Ecology and Evolutionary Biology 635 and Planning 635.)

662 Seminar in the History of Botany (2) History of botanical exploration and advances from early civilized to modern period. May be repeated. Maximum 4 hrs.

672 Seminar in the History of Botany (2) History of botanical exploration and advances from early civilized to modern period. May be repeated. Maximum 4 hrs.

680 Seminars in Radio and Television (3-15) P/NP only.

682 Methods and Instrumentation in Laboratory Investigation II (3) Project experience and theoretical background in various research methods, ion exchange resins, adsorption chromatography, disc electrophoresis, polargraphy, ionic and ultrasonic determination, gas chromatography, autoradiographs, microscopy, culture methods, use and detection of radiotopes. Prereq: Chemistry 350, 360; Physics 121, 122. May be repeated. Maximum 5 hrs. S/N only.

685 Methods and Instrumentation in Field Investigation II (1) Appropriate methods and instrumentation. Topics vary. May be repeated with consent of instructor. Maximum 5 hrs. S/N only.

690 Advanced Radio & Television Management (3)

700 Radio & Television Research (3) Special requirements of business, educational, and public broadcasting uses of video. Management, budgeting, planning, producing, and evaluating projects. Prereq: 430 or consent of instructor.


440 Corporate Video (3) Special requirements of business, educational, and public broadcasting uses of video. Management, budgeting, planning, producing, and evaluating projects. Prereq: 430 or consent of instructor.

480 Broadcast News Operations (3) Production of news programs on television stations. Electronic news gathering, editing and writing news packages and studio production. Prereq: Consent of instructor. F,A

470 Cable Television and Emerging Technologies (3) History and structure of cable television industry. Cable regulations and programming. Entry of telephone companies in distribution video. Analysis of all relevant technologies directing broadcast cable services. High definition television, and others. Prereq: Introduction to Radio and Television or consent of instructor.


550 International Broadcasting (3) Broadcasting systems in other countries. Analysis of international broadcasting organizations. Inter-cultural communication and international broadcasting. Development communication and international broadcasting. Prereq: Consent of instructor.

560 Radio & Television Law and Regulations (3) Legal problems faced by broadcast managers. Philosophy of regulatory policy formation. Efforts at self-regulation. Social and legal restraints, effects of laws and regulations, and public pressure on stations, networks, cable and new technologies. Unique situation of broadcasting among media in terms of regulations. Prereq: Consent of instructor or admission to program. F

570 Radio & Television Research (3) Various techniques used by stations and consultants in broadcast research. Applied audience research. Deciding which methods to use, interpreting results, and applying research to management decision making. Prereq: Communications 512 or 612, or consent of instructor. Sp

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, broadcasting and society. Prereq: Consent of instructor or admission to program. May be repeated. Maximum 6 hrs. (Same as Information Sciences 581.) F

590 Advanced Radio & Television Management (3) Financial management of broadcast operations: budgeting, financial planning, accounting, and related techniques. Theoretical perspectives in broadcast management, organization and management of commercial and non-commercial operations from perspective of general managers. Prereq: 430. Sp

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

598 Internship (3) Full-time (30-40 hrs per week) work 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.
The MBA program consists of a common first-year core and a wide selection of second-year concentration/elective courses. The first-year core develops a general management foundation upon which specialization is developed in the second year electives. The objective of the program is to develop leaders able to enhance the success of their organizations.

The program consists of two 15-credit-hour MBA core courses in the first year and 24 credit hours of concentration/elective courses in the second.

Admission Requirements
Applications are accepted for fall semester only. The application deadline for fall semester is March 1. Applications by U.S. citizens and permanent residents received after March 1 will be considered as space allows.

To be considered for admission, the applicant's file must be complete. A completed file includes the Graduate School Application, transcripts of prior college work, the MBA program application, two completed applicant recommendation forms, and the Graduate Management Admission Test (GMAT) score report. The first items should reach the Graduate School one month before the MBA application deadline to allow for processing. Additional information is required by The Graduate School for international students.

For admission to the MBA program, consideration is given to (1) applicant's academic record with particular attention to the last two years of undergraduate work and previous graduate studies, (2) scores on the GMAT and the Test of English as a Foreign Language (TOEFL) for those whose native language is not English, (3) work experience and other activities that demonstrate potential for leadership, and (4) recommendations from professors and work supervisors. The admission decision is based on all factors which make up the total application; therefore, there is no automatic cut-off for either grade point averages or GMAT scores. However, admission preference will be given to applicants with full-time work experience after obtaining the undergraduate degree.

Prerequisites
College-level mathematics through at least one course in college-level calculus, taken within the past 5 years, with a grade of B or better, is the only prerequisite requirement for entry into the program. Students whose undergraduate training does not include calculus should arrange to take it at UT Knoxville or at another accredited institution prior to the fall semester of entry into the program. Those electing the management science or statistics concentration must have completed two years of college-level calculus.

MBA Core
The MBA core consists of 25 hours, one taken each semester. The courses are taught by the MBA core faculty in an integrated fashion and through a year-long simulation requiring students to learn the functional fundamentals (accounting, finance, management, marketing) when they need to apply them to solving a specific business problem. The topics introduced within this course follow three major themes: the functional fundamentals (learned within a cross-functional framework); the role of the firm in society (with attention to stakeholder value, economics, and the ethical/global legal environment of the firm); and personal and team development. Students will be exposed to the assessment and delivery of customer value, statistical process control, continuous systems improvement and the role of quality in competitive organizations.

Students in the first-year core undertake active learning within a team-based environment. Many core requirements are experiential exercises in which self-discovery within a team setting is an important element of the learning process. Individualized support is provided for developing both written and oral communication skills.

Concentration and Electives
A concentration area may be indicated on the MBA Program Application or this declaration may be deferred until after matriculation. In any event, selection must be made after completion of the first year. Requests for changes in concentration area must be submitted for approval to the Office of Graduate Business Programs.

Among the 24 credit hours in the concentration/elective block, at least 9 but not more than 12 must be in one of the following concentration areas. For specific courses required in concentration areas, see the appropriate field of instruction.

Economics
Finance
Global Business
Transportation
Management
Marketing
New Venture Analysis and Entrepreneurship
Statistics

The remaining elective courses must be in fields outside the concentration area, normally selected from MBA courses offered in other departments of the college. Courses outside the College of Business Administration are available to residents of Louisiana (forest industries management), Kentucky (logistics and transportation), Alabama, Florida or Texas (concentration in logistics and transportation only), Kentucky (concentration in new venture analysis and entrepreneurship or environmental management), Virginia (concentration in environmental management or logistics and transportation), or West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

ACADEMIC COMMON MARKET
An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state basis. The Ph.D. in Business Administration is available to residents of Alabama, Florida, or Kentucky (concentration in logistics and transportation only), or West Virginia; the MBA is available to residents of Louisiana (concentration in forest industries management or logistics and transportation), Alabama, Florida or Texas (concentration in logistics and transportation only), Kentucky (concentration in new venture analysis and entrepreneurship or environmental management), Virginia (concentration in environmental management or logistics and transportation), or West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

ACADEMIC STANDARDS
A graduate student in the College of Business Administration whose grade-point average falls below 3.0 will be placed on probation. A student on probation will be dropped from the program unless his/her cumulative 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.

THE MBA PROGRAM
The MBA program is designed for students with undergraduate degrees in the social and natural sciences, the humanities, and professional fields such as engineering, business, agriculture, and architecture. The MBA program is a two-year program with students beginning in the fall of each year and graduating in the spring, two years hence. During the summer between the first and second year, students must complete an internship with a company using those skills acquired during the first year of the MBA program.
BUSINESS ADMINISTRATION

For complete listing of MBA program requirements, see above.


In recognition of the growing globalization of business activity and the importance of the international environment to successful management of every firm, the MBA program offers a concentration in global business. The concentration comprises at least two courses taken from Economics 424, Logistics 507, Management 571, and departmental special topics courses with international content; and at least one but not more than two additional courses from the previous list, or from a list of electives as approved by the Director of Graduate Business Programs. Students pursuing a concentration in global business are strongly encouraged to pursue it as a second concentration in addition to one of the traditional departmental concentrations. Students pursuing this concentration are also strongly encouraged to pursue an international or internationally related internship for the summer between their first and second years in the MBA program. Students are expected to participate in a foreign exchange or field experience if at all possible, especially for those with no previous foreign experience. Language training is advised but not required, and beginning language courses are not typically available for graduate credit.

The concentration in new venture analysis and entrepreneurship is comprised of three specifically designed courses which are interdisciplinary in nature. This concentration strives to build a strong academic foundation for both entrepreneurial and intrapreneurial activities. The new venture analysis and entrepreneurship concentration is offered in recognition of the growing trend in American business today towards new product/venture development. The new venture analysis and entrepreneurship concentration comprises at least two elective courses in another area (management or marketing) to achieve a dual concentration.

Minimum course requirements are Finance 551, Management 551, and Marketing 550. These course descriptions are listed under their fields of instruction.

PRE-MBA PROGRAM

The College offers a joint BA/MBA program with the College of Arts and Sciences. Students in this program take their first three years of coursework in Arts and Sciences, and their last two years in the College of Business Administration. Within their first three years, students fulfill all general education requirements for the BA degree, both upper and lower division along with a minor offered by one of the Arts and Sciences departments. They may use one Economics course only to fulfill distribution requirements, and they are required to take a year of calculus as the only prerequisite to the MBA.

Admission requirements are higher than those normally expected of MBA applicants. Desired qualifications include a minimum 3.4 GPA and a GMAT score of 600 or higher.

Students interested in the program are counseled initially in the Arts and Sciences Advising Center regarding admission standards and Arts and Sciences requirements. At the end of their second year, they have a conference with the Director of Graduate Business Programs and are advised of their prospects for formal admission. Students who are likely candidates are advised to take the Graduate Management Admission Test in October of the third year, and to submit an application to the MBA program. The admission decision is made by January of the third year.

Upon admission, students begin MBA coursework in the fourth year and are awarded a BA degree at the end of that year. Upon successful completion of the fifth year (minimum of 30 semester hours of graduate credit), the student receives the MBA degree.

DUAL J.D.-MBA PROGRAM

The College of Business Administration and the College of Law offer a coordinated dual program leading to the conferred of both the Doctor of Jurisprudence and the Master of Business Administration. The dual program saves the student approximately one semester over the time that would be required to earn both degrees independently.

The establishment of the dual program recognizes the increasingly complex body of knowledge necessary to the creative conduct of business and business-related law practice, the complementary nature of many aspects of the graduate programs of the College of Law and the College of Business Administration, and the intellectual benefits inherent in the concurrent study of both business and business-related law. The program is designed to accommodate the interests of students who (a) contemplate a career in public service and want to acquire the skills and perspective of the lawyer and the business-oriented manager, (b) contemplate a career in business management and want to acquire the skills and perspective of a lawyer, or (c) contemplate a career as a lawyer specializing in business-related law and want to acquire the skills and perspective of the business-oriented manager.

Admission Requirements

Applicants for the J.D.-MBA program must make separate application to, and be competitively and independently accepted by, the College of Law for the J.D., The Graduate School and College of Business Administration for the MBA degree, and by the Dual Program Committee.

Students who have been accepted by both colleges 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 be started prior to entry into the last 28 semester hours of J.D. coursework and prior to entry into the second year of the MBA program. Students interested in entering the dual 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. for acceptable performance in approved graduate-level courses offered by the College of Business Administration. The College of Business Administration will award up to 9 semester hours of credit toward the MBA for acceptable performance in approved courses offered in the College of Law. The approval of courses is the responsibility of the Dual Program Committee and the student's assigned advisor.

Students may begin their studies in either the J.D. or the MBA program, but 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. For any term in which students take MBA courses, even though they are also taking law courses, they must register through The Graduate School. The Graduate School registration form must be approved by the Director of Graduate Business Programs.

Awarding of Grades

Grades for graduate business courses accepted by the College of Law and grades for law courses accepted by the College of Business Administration will be converted to either Satisfactory or No Credit and will not be included in the computation of the student's grade average or class standing in the college in which such grades are so converted. The College of Law will award a grade of Satisfactory for a graduate business course in which the student has earned a B grade or higher and a No Credit for any lower grade. The College of Business Administration will award a grade of Satisfactory for a law course in which the student has earned a 2.3 grade or higher and a No Credit for any lower grade. Grades earned in courses of either college may be used on a regular graded basis for any appropriate purpose in the college offering the courses. The official academic record of the student maintained by the Registrar of the University shall show the actual grade assigned by the instructor without conversion.

Approved Dual Credit

MBA courses to be counted toward the J.D. program must include 9 semester hours approved by the College of Law. Law courses
to be counted toward the MBA must be selected from those approved by the Director of Graduate Business Programs.

**DUAL M.S.-MBA PROGRAM**

The College of Business Administration and the College of Engineering offer a coordinated program leading to the conferral of the Master of Business Administration degree (concentration in manufacturing management) and the Master of Science degree with a major in Industrial Engineering (concentration in manufacturing systems engineering). The dual program saves the student one or two semesters over the time that would be required to earn both degrees independently.

The establishment of the dual program addresses the critical need for personnel trained in both engineering and management who can integrate this increasingly complex body of knowledge in achieving the efficient operation of manufacturing and production firms. The program is designed to accommodate the interests of student who desire a career leading to a leadership position in a manufacturing organization.

**Admission Requirements**

Applications are accepted for fall semester only. Applicants for the M.S.-MBA program must make separate application to, and be competitively and independently accepted by, The Graduate School for the Master of Business Administration degree program and the Master of Science degree program with a major in Industrial Engineering, and by the Dual Program Committee.

Students will initially apply for the MBA program, indicating on that application the intent to pursue the dual M.S.-MBA program in manufacturing (refer to the MBA program for separate instructions). During the second semester of the first year, students will revise through The Graduate School to the M.S. program with a major in Industrial Engineering beginning Fall semester of the second academic year. Students accepted for both degree programs will be assigned by the Dual Program Committee, who will be responsible for course approval and supervision of the student's progress through the dual program.

Applications by U.S. citizens and permanent residents received after the MBA application deadline (March 1) will be considered as space allows. Additional information is required, and different application dates are established by The Graduate School for international students.

**Curriculum**

The curriculum in the first academic year of the dual M.S.-MBA program is the two-semester core of the MBA program (two 15-hour courses, one per semester). A 1-hour seminar course each semester in manufacturing will also be taken concurrently during the first two semesters (not for graduate credit). A 3-hour design or industrial problem project will be accomplished in the summer term of the first year. This will be supervised by a faculty member associated with the dual program. During the second year, 27 hours of coursework will be completed in the manufacturing systems engineering concentration in Industrial Engineering plus an additional 9 hours of graduate courses in the College of Business Administration acceptable in meeting the requirements of the MBA program. Fifteen hours will be taken during each of the first two semesters of the second academic year. A culminating 6-hour integrated case study requiring use of most previous material, and a final examination as required by the Dual Program Committee, will be taken during the first session of summer term of the second year.

The dual degree candidate must satisfy the curriculum and graduation requirements of the Department of Industrial Engineering and the College of Business Administration. Dual degree students withdrawing from the dual program before completion of both degrees will not receive credit toward graduation in either degree program for courses in the other degree program, except as such courses qualify for credit without regard to the dual degree program. The M.S. and the MBA degrees will be awarded upon successful completion of the requirements of the dual program.

**Approved Dual Credit**

A maximum of 6 semester hours of approved graduate-level courses completed in the College of Business Administration may be counted toward the M.S. degree program with a major in Industrial Engineering. A maximum of 15 semester hours of approved graduate-level courses completed in the Department of Industrial Engineering may be counted toward the MBA degree program. The approval of courses is the responsibility of the Dual Program Committee and the student’s assigned advisor.

**PROFESSIONAL MBA PROGRAM**

The professional MBA is provided for fully employed individuals. The professional MBA is designed for professionals holding middle and upper level positions in organizations that wish to support their attainment of an MBA degree.

The professional program is three consecutive terms completed in one year. Each term requires two residence periods on campus. In this integrated program of reading, study and on-the-job applications, the off-campus work requires substantial and regular contact with program faculty and other participants and includes assigned assignments to be carried out.

Students will be awarded the MBA degree after successful completion of the program. The program consists of a three 12-hour core courses and a 6-hour sequence which is a project of diagnosis and analysis of a significant strategic issue in the sponsoring organization.

**Admission Requirements**

All participants begin and complete the program together in one twelve-month period. Sessions begin in January of each year. Final deadline for applications is October 10 of the preceding calendar year. For admission to this program, primary consideration is given to the applicant's work history and the recommendation from the sponsoring organization and the GMAT. There is no cut-off for either grade-point averages or GMAT scores, however, applicants will be evaluated on their ability to operate on a par with other high achieving participants.

**Prerequisites**

There are no specific course prerequisites for admission. However, undergraduate courses and work experience should demonstrate ability with both qualitative and quantitative work.

**Transfer Credits**

Because of the fully integrated nature of the professional MBA core curriculum, no credit hours may be transferred as substitutes for core curriculum.

**Other Requirements**

Other requirements are the same as those for the full-time MBA program.

**EXECUTIVE MBA PROGRAM**

The executive MBA program is designed for professionals holding middle and upper level positions in organizations that wish to support their attainment of an MBA degree.

The objective of the program is to provide advanced management skills to individuals who play key roles in leading their organizations. The executive track of the MBA is three consecutive terms completed in one year. Each term requires two residence periods on campus. In this integrated program of reading, study and on-the-job applications, the school provides substantial and regular contact with program faculty and other participants and includes assigned assignments to be carried out.

Students will be awarded the MBA degree after successful completion of the program. The program consists of a three 12-hour core courses and a 6-hour sequence which is a project of diagnosis and analysis of a significant strategic issue in the sponsoring organization.

**Admission Requirements**

All participants begin and complete the program together in one twelve-month period. Sessions begin in January of each year. Final deadline for applications is October 10 of the preceding calendar year. For admission to this program, primary consideration is given to the applicant's work history and the recommendation from the sponsoring organization and the GMAT. There is no cut-off for either grade-point averages or GMAT scores, however, applicants will be evaluated on their ability to operate on a par with other high achieving participants.
The program is taught by a core faculty of 10 professors assisted by other faculty on an ancillary basis. The core faculty develop the entire curriculum and teach it in an integrated, interdisciplinary manner.

The MBA program for executives is completed in three terms and requires registration for 15 hours in each term. The first term is comprised of Executive Core I and Management Project I; it includes two residence sessions. The second term is comprised of Executive Core II and Management Project II; it includes two residence sessions the first of which will be in some international venue. The third term is comprised of Executive Core III and Management Project III. It includes two residence sessions.

The core courses are a full-term curriculum with reading and study, case work and problem solving, as well as analyses and applications within the sponsoring organization during the off-campus periods. The topics introduced within these courses follow five major themes: the functional fundamentals (learned within a cross-functional framework); continuous improvement from a systems-thinking perspective; the role of the firm in the global environment; organizational culture and change management; and personal and team development.

The management project is carried out as an independent project with faculty advisor. It involves the diagnosis and analysis of some significant aspect in the sponsoring organization and is based on applying major themes in the core courses. The written project and presentation to senior management and faculty serves as the comprehensive examination.

The off-campus work requires substantial and regular contact with faculty.

Transfer Credits

Because of the integrated nature of the curriculum, no credit hours for courses already taken may be substituted for those in the executive program of the MBA.

Executive MBA in Taiwan

The executive MBA taught in Taipei, Taiwan is designed for professionals residing in Taiwan and other countries. Its target audience and objectives are the same as those on the Knoxville campus, except that the sequence of material has been changed to accommodate the schedules of faculty teams traveling to Taiwan. The executive track of the MBA in Taiwan results in the same Master of Business Administration degree as the full-time MBA and executive MBA on the Knoxville campus.

The executive MBA in Taiwan is three semesters of 15 credit hours each, including the same core and project courses described for the Knoxville program. Between each semester, there is a term when students are not enrolled. The program begins in the Summer term, continues in Spring semester of the following calendar year and is completed in the Fall semester of that same year. All participants begin and complete the program together.

Each semester is comprised of two periods of concentrated class work with a continuous program of reading, study and on-the-job applications between class periods. The class will meet occasionally during the semesters in which they are not enrolled for purposes of discussing the readings and assignments and for assisting one another. The first five periods will be taught in Taiwan. The sixth class period is a three-week residency on the Knoxville campus.

Admissions Requirements for the Executive MBA in Taiwan

To be considered for admission, the applicant must have the equivalent of a U.S. bachelor's degree and 10 or more years of work experience. Applicants must submit a complete application file including the Graduate School application, official transcripts of prior college work, and the executive MBA application with a recommendation from their company. Admission to the program is competitive. Primary consideration is given to the applicant’s work history and the recommendation from the applicant’s manager, and applicants will be evaluated on their ability to operate on a par with other high achieving participants.

Each international participant who has not taken the Test of English as a Foreign Language (TOEFL) within the previous two years must take and pass it with a score of 550 or higher. This test may be taken after enrolling in the program but must be successfully completed prior to the international study period in the U.S. To allow for registration, delivery of scores and receipt of the I-20, participants should arrange to take the TOEFL at least 5 months before the international study period.

Executive MBA for Physicians

The physician track of the executive MBA is custom designed for physicians. Its objectives are the same as the generalized executive track of the MBA on the Knoxville campus. The curriculum content is like that of the Knoxville executive MBA, except that it is focused on executive education within the health care industry. The physician track of the executive MBA program results in the same Master of Business Administration degree as the full-time MBA and executive MBA programs on the Knoxville campus.

The physician program is three semesters of 15 credit hours each, including the same core and project courses described for the Knoxville program. The program begins in the Spring semester, continues into the Summer term, and is completed in the Fall semester of that same year. All participants begin and complete the program together.

Each term begins with one intensive residential period of concentrated class work with subsequent interactive sessions between faculty and students using distance learning technologies. In addition, a fourth and final residential period at the end of the Fall term will conclude the educational experience.

Admission Requirements for the Executive MBA for Physicians

To be considered for admission, the applicant must have an M.D. degree and 5 or more years of work experience. Applicants must submit a complete application file including the Graduate School application, official transcripts of prior college work, and the executive MBA application. Admission to the program is competitive. Applicants will be evaluated on their ability to operate on a par with other high achieving participants and on their future management potential.

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 considered for acceptance by the College of Business Administration to The Graduate School. Actual admission is based on the applicant's overall standing compared with other applicants and the number of vacancies in each department. The Graduate School requires the Graduate School Application, transcripts from all previous college work, and additional information from international students. The college requires the Ph.D. application, scores from the GMAT, and four written recommendations. All materials should be received by the College of Business Administration not later than March 1. Late applications are considered only if space is available.

Under exceptional circumstances, a student may be considered for acceptance into the Ph.D. program without having a master's degree. An applicant in this situation should have an outstanding undergraduate background and should represent a deep and sincere commitment to the pursuit of a career in research and instruction.

Program of Study

The Ph.D. normally requires at least three 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 year usually focuses on completion of the dissertation research and writing. 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. Typically, the College of Business Administration offers financial support for doctoral students during their tenure in the program.

The Ph.D. program is highly flexible, offering a wide array of concentrations and cognates. Moreover, heavy emphasis is placed on individualized instruction and close student-faculty interaction. Instruction takes the form of regular classes, doctoral seminars, and independent study and research. Students are also encouraged to attend lectures and discussions by visiting scholars throughout the year.

There are six concentrations offered in the Ph.D. program:

Accounting
Finance
Logistics and Transportation
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 Director of Graduate Business Programs. Specific concentrations may have prerequisites.
3. Research Tools: A minimum of 9 semester hours of graduate research methods must be completed. At least 6 semester hours in statistics courses beyond Statistics 531 are required. The remaining 3 semester hours may be completed in additional statistics courses (not to include Statistics 531) or in other areas such as research methodology, management science, computer science, econometrics, and psychometrics.
4. Concentrations: The concentration is the focal point of the Ph.D. program. Students are expected to master the literature and research techniques in the concentration area and do quality research as evidenced by the preparation of an acceptable dissertation. A minimum of 12 semester hours of coursework is required, including at least 9 hours of doctoral seminars. Graduate work taken in the concentration at other institutions is considered by the temporary doctoral advisory committee in approving the specific coursework required. Available concentrations are: accounting, finance, logistics/transportation, management (operations management and strategic management), marketing, and statistics. See the appropriate fields of instruction for specific course requirements.
5. A minimum of 9 semester hours of graduate coursework is required in an area outside, but complementary to, the concentration. The student may choose the cognate from one of the following: one of the six concentration business areas listed above, economics, or a related area in another school or college of the University.

Comprehensive Examinations

Comprehensive written examinations over the concentration area are required of each person seeking candidacy for the Ph.D. degree. This examination is administered in two sessions of approximately four hours each. Students qualify in the cognate area by completing a one-session, four-hour examination or an equivalent jointly approved by the student's major professor and the student's advisor in the cognate area. Comprehensive examinations are generally offered during the fall and spring terms. Comprehensive examinations may 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 School policy, the student and the major professor jointly select 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 discipline, concentration and cognate area). Graduate courses accepted from other institutions must be included. Under "Other Requirements," the date of acceptance of the research proposal by the doctoral committee should be indicated. The application must be approved by the student's doctoral committee and the Associate Dean before submission to The Graduate School.

Dissertation

Minimum of 24 semester hours: The student must complete a dissertation embodying the results of original research demonstrating the ability to do scholarly writing. The dissertation is supervised by the candidate's doctoral committee, which must certify its completion and acceptability after oral defense of the candidate's research effort.

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

GRADUATE COURSES

502-03 Business Core for Master of Accounting I, II (3.3) Development of role and responsibility of accountant as business advisor. Assessment and delivery of customer value, continuous system improvement, statistical process control, human resource management, role of quality in competitive organizations, performance measurement, financing, and overall corporate strategy. Prereq: Admission to M.Acc. program.

504 Core I (15) Development of roles and responsibilities of business manager. Functional fundamentals (accounting information systems, financial reporting, marketing, human resource management) through year-long case in which knowledge is applied to solution of simulated real-world enterprise. Continuous systems improvement and delivery of customer value: role of firm in society (with attention to stakeholder value, economics, and the ethical and legal environment of firm). Personal leadership skills: team building, written and oral communication, and assessment of students' leadership abilities in groups. Admission to MBA program or consent of Director of Graduate Business Programs.

505 Core II (15) Continuation of 504. Functional fundamentals through year-long case in organization (real), global competition, managing technology, ethics and social responsibility, and strategic planning. Capstones in integrated business simulation. Prereq: 504 or consent of Director of Graduate Business Programs.

506 Information Engineering and Management (3) Design and management of information necessary to accomplish organizational objectives. Activity blueprints, entity-relationship diagrams, data dictionary principles, view diagrams and CASE (Computer-Aided Software Engineering) tools.

510 Management of Responsive Service Organizations (3) Management of organizations which respond to customer requests rather than to produce inventory: non-product economics, relationship building and management methods built on analyzing, empowering, monitoring and mentoring employees as they diagnose and respond to individual customer needs.

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


561 Management Project I (3) Company project. Preliminary investigation of significant strategic issue (new initiative program or significant organizational change to enhance organizational effectiveness) in sponsoring organization. Work within firm under guidance of faculty to develop proposal. Major part of the project. Prereq: Admission to executive program of MBA and cooperation of sponsoring organization. Coreq: 551.


593 Directed Independent Study (3) Cross-disciplinary topic of mutual interest to student and faculty. Available only by management with consent of faculty member. May require approval of Director of Graduate Business Programs. May be repeated. Maximum 6 hrs. S/U or letter grade.
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 (Ch E 580).

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

THE DOCTORAL PROGRAM

Students applying for entrance into the doctoral program must submit evidence of ability to perform and report independent research to the satisfaction of the department. The master's thesis may be offered as such evidence.

Department requirements consist of the satisfactory completion of:

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

2. Supporting courses in related scientific and engineering fields amounting to approximately 24 semester hours, subject to approval by the student's faculty committee. These related fields will normally include chemistry, mathematics, physics, and engineering.

3. The comprehensive examination, consisting of a written part and an oral part. The written part covers thermodynamics, reactor analysis, and transport phenomena and separations.

4. Active participation in graduate seminars conducted by the department. Resident students must register for CHE 501 every semester offered.

GRADUATE COURSES

403 Introduction to Optimization (3) Principles and applications of optimization techniques to chemical processes. Use of numerical and nonnumerical constrained optimizations, linear programming, and geometrical programming. Prereq: Mathematics 240.


467 Honors: Engineering Internship in Process Control (4) Selected students work in small groups on industrial processes. Prereq: CHEM 510. 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 computer systems. Techniques of analysis with emphasis on implementation, hierarchical structures, and software oriented concepts used to design automation solutions. Human-machine interfaces. Workstations with modern industrial equipment, interactive graphics, and visualization environments. Prereq: Process Dynamics and Control and consent of instructor.


485 Hydrocarbon Processing (3) Chemical and physical properties of selected petroleum and other processes utilizing conversion of raw material into fuels and selected chemical feedstocks. Prereq: Mass Transfer and Separation Processes, Organic Chemistry.

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

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

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

505 Engineering Analysis (3) Solution and formulation of problems in chemical engineering and materials areas, ordinary and partial differential equations, types of ODE, PDE and solution techniques; transform methods; formal mapping; variational methods; introduction to numerical methods. (Same as Materials Science and Engineering 505.)

507 Application of Numerical Linear Algebra in Systems and Control Engineering (3) Fundamental concepts of linear algebra to problems in systems and control areas. Geometric and physical interpretations of relevant concepts: least square problems, LU, QR, and SVD decompositions of matrix, eigenvalue problems and similarity transformations in solving difference and differential equations. Numerical computational aspects of various algorithms. Application of linear algebra concepts in optimization studies. Introduction to linear programming. Prereq: Graduate standing or consent of instructor. Prereq: CHEM 531 and CHEM 532.

531 Advanced Chemical Engineering Thermodynamics (3) Phase equilibrium in ideal and nonideal solution; composition relationship between phases, solution behavior and application to macro-molecules; introduction to microscopic approach to thermodynamics.


541 Fluid Mechanics and Polymer Processing (3) (Same as Materials Science and Engineering 541.)

542 Diffusive and Stage-wise Mass Transfer Operations (3) Analysis of mass transfer phenomena, coupled mass transfer and reaction, mass transfer operations in packed towers and agitated vessels, membrane separations, Bioreactor stage models, mass transfer, and mass transfer, emphasizing nonisothermal and multifluid systems.

547 Introduction to Transport Phenomena (3) Unified treatment of mass, momentum, and heat transfer. Diffusive and macroscopic balances in deriving governing equations. Analogies between processes. Use of dimensionless approach in scaling systems up or down. Application involving transfer and simultaneous chemical reactions.

551 Chemical Reactor Analysis (3) Rate models for heterogeneous reactions, properties of porous catalyst, catalyst deactivation, fluid-fluid and fluid-solid reactors.

551 Process Modeling and Simulation (3) Theories and structures of models, and art of simulation. Model development from basic principles. Model development from plant test. Use of models in operation, optimization and control. Prereq: Consent of Instructor.
575 Applied Microbiology and Bioengineering (3) Crossdisciplinary course combining basic concepts in microbiology, biochemistry, reaction kinetics, and bioengineering. Commercial processes, biotechnology, wastewater treatment, analysis of basic bioreactor systems, biosensors, and immobilization methods. Fundamental laboratory techniques during 5-week laboratory period, taught by Environmental Engineering 575, Agricultural Engineering 575 and Microbiology 575.


581 Industrial Pollution Prevention (3) Principles and practical aspects of industrial waste minimization. Regulatory environment, waste minimization strategies, economic analysis, process safety, case study; analysis of alternative waste minimization/management technologies. Prereq: Graduate standing in engineering or consent of instructor. (Same as Environmental Engineering 581 and Environmental Science and Mechanics 585.)

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

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

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

631 Advanced Topics in Statistical Thermodynamics and Molecular Dynamics (3) Statistical thermodynamics, molecular-based models, Monte Carlo and molecular dynamic calculations; applications to supramolecular, macromolecular 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 applications in analysis and design of separation processes, and chemical and biochemical reactors. Preq: 558, 547.


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

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

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

Chemistry

(College of Arts and Sciences)

MAJOR

DEGREES

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

Michael Sepaniak, Head

Professors:

Adcock, J. L., Ph.D. .......... Texas
Alexandritos, S. D. (Hoochest-Celanese) Prof. of Polymer Science), Ph.D. . California
Baker, D. C. (Paul and Wilma Ziegler Prof.), Ph.D. .... Ohio State
Bartmess, J. E., Ph.D. .... Northwestern
Bloer, J. E. (Emeritus), Ph.D. .... Manchester
Bull, W. E. (Emeritus), Ph.D. .... Illinois
Chambers, J. Q., Ph.D. ....... Tennessee
Cook, K. D., Ph.D. ............. Wisconsin
Dean, J. A. (Emeritus), Ph.D. .... Michigan
Eastham, J. F. (Emeritus), Ph.D. .... California
Fletcher, W. H. (Emeritus), Ph.D. .... Minnesota
Grimm, F. A., Ph.D. ......... Cornell
Guilcson, G. (Distinguished Scientist), Ph.D. .... Ecolle Polytechnic and Paris VI
Kabanak, G. W. (Robert H. Cole Prof.), Distinguished Prof., Ph.D. .... Purdue
Kleinfeld, D. C., Ph.D. ....... Princeton
Kovac, J. D., Ph.D. ............ Yale
Lietzka, M. H. (Emeritus), Ph.D. .... Wisconsin
Magid, L. J., Ph.D. .......... Tennessee
Pagni, R. M., Ph.D. .......... Wisconsin
Peterson, J. R., Ph.D. ....... California
Schweitzer, G. K. (Distinguished Prof.), Ph.D. .... Illinois
Sepaniak, M. J., Ph.D. .... Iowa State
Smith, W. T. (Emeritus), Ph.D. .... Ohio State
VanHook, W. A. (Paul and Wilma Ziegler Prof.), Ph.D. .... Johns Hopkins
Wehry, E. L. (Emeritus), Ph.D. .... Purdue
Williams, T. F. (Distinguished Prof.), Ph.D. .... London
Wunderlich, B. (Distinguished Scientist), Ph.D. .... Northwestern

Associate Professors:

Barnes, C. E., Ph.D. ....... Stanford
Feigl, C. S., Ph.D. ........... Colorado
Schell, F. M., Ph.D. ......... Indiana
Xue, Z. B., Ph.D. .......... California

Assistant Professor:

Dadmun, M. D., Ph.D. ....... Massachusetts
Gilman, S. C., Ph.D. ....... Penn State
Hinde, Robert J., Ph.D. ....... Chicago
Young, D. G., Ph.D. ........ Ohio State

Students majoring in Chemistry for the master’s or doctoral degree are required to present as a prerequisite one year each of general, analytical, organic, and physical chemistry with a satisfactory record. At least one-half year of inorganic chemistry is also recommended. Students lacking any of these prerequisites may be admitted with appropriate deficiencies that must be removed without graduate credit. Applicants are required to take the general Graduate Record Examination. Students minoring in Chemistry are required to present as a prerequisite two years of chemistry including quantitative analysis.

THE MASTER’S PROGRAM

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

The requirements for the M.S. in Chemistry consist of the satisfactory completion of:

1. Research and a dissertation to give at least 24 hours of graduate credit in Chemistry 600. Registration must be continuous from the beginning of research.
2. Participation in seminar (Chemistry 501) during the entire period of graduate study, including the presentation of at least one seminar. (No more than 2 hours may be applied to the course requirements.
3. Prescribed remedial courses based on performance on entrance examinations.
4. Sufficient graduate coursework in chemistry (at the 400 level or above) and/or a related field to make an overall total of at least 24 hours, including one of the following sequences: 530-31, 550-51, 570-72, 550-94-95, or three courses from 510-11-12.
5. A final oral examination.

THE DOCTORAL PROGRAM

The department offers concentrations in eight areas for the Ph.D.: analytical chemistry, chemical physics (in cooperation with the Department of Physics), environmental chemistry, inorganic chemistry, organic chemistry, physical chemistry, polymer chemistry, and theoretical chemistry.

The requirements for the Ph.D. in Chemistry (except for the chemical physics concentration) consist of the satisfactory completion of:

1. Research and a dissertation to give at least 24 hours of graduate credit in Chemistry 600. Registration must be continuous from the beginning of research.
2. Participation in seminar (Chemistry 501) during the entire period of graduate study, including the presentation of at least one seminar.
3. Prescribed remedial courses based on performance on entrance examinations.
4. Completion of the comprehensive examination series and defense of an original research proposal to give 2 hours of credit in Chemistry 601.
5. Eighteen additional hours in courses at the 500 level or above including at least one course above 601 and one of the following sequences: 510-11-12, 530-31-32, 550-51, 570-72, 550-94-95.
6. A final oral examination.

The Ph.D. program with concentration in chemical physics is conducted jointly with the Department of Physics. Requirements 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, bonding theories, descriptive chemistry of elements, kinetics and mechanism of inorganic reactions, applications of modern techniques for characterization, coordination and organometallic chemistry. Prereq: 330. Prereq or coreq: 380 or 381. Sp


471-81 Biophysical Chemistry (3,3) Same as Biochemistry and Cellular and Molecular Biology 471-81.

473-83 Physical Chemistry (3,3) Students may not receive credit for both 473 and 473 nor for both 483 and 483. 473-83-Properties of gases; first, second, and third laws of thermodynamics; chemical equilibria; simple phases, solid solutions, properties of solutions; introduction to statistical thermodynamics. 483-Kinetics of chemical reaction; introduction to quantum mechanics and applications to electronic structure of atoms and molecules.
molecular spectroscopy. Prereq: General Chemistry, Elements of Physics or Fundamentals of Physics: Electricity and Magnetism, and Calculus III. F, Sp

479-89 Physical Chemistry Laboratory (2, 2) Experiments on topics discussed in 471-81 and 473-83. Prereq or coreq: Corresponding courses 471 or 473 for 479 and 481 or 483 for 489. Lab: 479-E, 489-Sp

484 Advanced Physical Chemistry (3) Chemical dynamics, statistical thermodynamics, quantum mechanics of atomic and molecular systems, crystal structure and solid state. Prereq: 481 or 483. Sp

500 Thesis (1-16) F/P/NP only. E

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

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

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/N/NC only. E

510 Analytical Spectrometry (3) Principles and practice of optical and mass spectrometric techniques in quantitative chemical analysis. Prereq: 1 yr of physical chemistry. F

511 Analytical Separations (3) Principles and practice of chemical separations based on extraction, chromatographic, and electrothermic phenomena. Prereq: 1 yr of physical chemistry.

512 Electroanalytical Chemistry (3) Fundamentals of electrode processes, principles and practice of electroanalytical techniques in quantitative chemical analysis and applied to study of chemical systems. Prereq: 1 yr of physical chemistry. F

520 Chemical Instrumentation (3) Principles of analog and digital systems in chemical instrumentation; practice in design and construction of chemical instruments. Prereq: Consent of instructor. F

530 Chemical Bonding (3) Wave mechanical atom, group theory, quantum approach to molecular orbital theory, covalent, ionic, and metallic bonding, ligand field theories, solid state. Prereq: 1 yr of physical chemistry. F

531 Characteristic of Inorganic Compounds (3) Descriptive chemistry of elements; structure, reactions, kinetics, mechanisms, equilibria, and spectra of coordination, organometallics, biinorganic compounds. Prereq: 530. Sp

532 Experimental Methods of Inorganic Chemistry (3) Electronic, infrared, Raman, microwave, NMR, ESR, nuclear quadrupole, Mössbauer, mass, and photoelectron spectroscopies for characterization of inorganic compounds. Prereq: 530. F

540 Nuclear and Radiochemistry (3) Nuclear properties, radioactivity, radioactive decay processes, nuclear structure and models, nuclear reactions, radiations and matter, radiation detection. Prereq: 1 yr of physical chemistry. F

550 Structure and Reactivity in Organic Chemistry (3) Structure and bonding in organic compounds; molecular orbital theory, resonance, conformational analysis, and molecular mechanics, substituent effects on acidity and reactivity; introduction to reaction mechanisms. Prereq: 360. F


552 Organic Reaction Mechanisms (3) Techniques and principles in study of organic reaction mechanisms; applications and interpretations in polar, radical, and pericyclic reactions; reactive intermediates. Prereq: 550. Sp

553 Spectroscopic Characterization of Organic Compounds (3) Organic structure elucidation using spectroscopic methods: nuclear magnetic resonance, infrared, ultraviolet and mass spectrometry. Prereq: 360 or equivalent. F

554 Organic Spectroscopy Laboratory (1) Use of IR, UV, MS and multinuclear FTNMR spectrometers. Development of problem-solving abilities in area of spectroscopic characterization of organic compounds. Prereq: 360 or equivalent. Coreq: 553. F

570 Quantum Chemistry and Spectroscopy (3) Basic principles of quantum mechanics and their applications to molecular orbital theory, molecular structure, and spectroscopy; introduction to group theory. Prereq: 1 yr of physical chemistry. F

571 Advanced Quantum Chemistry and Spectroscopy (3) Prereq: 570 or consent of instructor. Sp

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. Prereq: 1 yr of physical chemistry. F

573 Chemical Kinetics and Transport (3) Time-dependent behavior of chemical reactions; chemical kinetics, chemical dynamics, transport theory. Prereq: 1 yr of physical chemistry. Sp

590 Polymer Chemistry (3) Fundamentals of polymer synthesis and characterization through application of organic and physical chemical principles. Prereq: 1 yr of organic and physical chemistry. F

594 Organic Chemistry of Polymers (3) Synthesis of monomers; mechanism, stereochemistry, sequence distribution, and kinetics of polymerizations. Formation of block, graft, and network polymers. Prereq: 590 or equivalent. Sp

595 Physical Chemistry of Polymers (3) Conformation of macromolecules, solution and bulk properties, rubber elasticity, kinetics of polymerization, polymer thermodynamics. Prereq: 590 or equivalent. Sp

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

601 Chemistry Research Proposal (2) Preparation and oral defense of original written research proposal based on thorough survey of chemical literature. Prereq: Consent of department head. S/N/NC only. E

610 Selected Topics in Analytical Chemistry (3) Topics of current significance. Prereq: 510-11-12 or consent of instructor. May be repeated. Maximum 12 hrs. F

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. F

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. F

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. F

690 Selected Topics in Polymer Chemistry (3) Topics of current significance. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs. F

---

Child and Family Studies

(Degree of Master of Science of Human Ecology)

MAJORS

Child and Family Studies......................... M.S. of Human Ecology......................... Ph.D.

---

Nordquist, V. Mick, Ph.D....................... Tennessee
Steele, Connie, Ed.D.......................... Texas Tech
Twardocz, Sandra, Ph.D........................ Kansas

Associate Professors:
Allen, Jan, Ph.D............................ Purdue
Malia, Julia, Ph.D............................ Iowa State
Smith, Delores, Ph.D.......................... Oklahoma State
Tegano, Deborah, Ph.D........................ Virginia Tech

Assistant Professors:
Groves, Melissa, Ph.D........................ Virginia Tech
Morris, Lane, Ph.D............................ Tennessee

---

The Department of Child and Family Studies encompasses two primary concentrations: child development and family studies. Integration of these areas creates a unique perspective for the study of individuals and families. Each graduate student's program of study is carefully planned in conjunction with a faculty committee to establish a program consistent with individual goals. All programs are characterized by a broad array of coursework, varied research experiences, and opportunities for experiences in applied settings.

Because the doctoral degree is a research degree, students at this level receive substantial preparation in statistics and research methodology. Interested students should contact the department head.

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 School Rating Forms by individuals who can attest to the potential for graduate education. Forms may be obtained from the department or Dean's Office, College of Human Ecology.

Admission to the program is contingent upon faculty evaluation of GRE scores, undergraduate/graduate GPA, rating forms, and work experience. Prerequisites for admission to the master's or doctoral program are 9 semester hours of either upper division undergraduate or graduate social science.

THE MASTER'S PROGRAM

An individual program of study may be designed by the student in collaboration with his or her major professor and committee. The program provides for a concentration in either child development or family studies.

The M.S. with a concentration in child development offers two tracks. Track 1 is designed to meet the needs of professionals who work in programs encompassing a variety of early childhood programs. Specializations in Track 1 consist of early childhood education, early childhood special education, early childhood administration, and child development. Thesis and non-thesis options are available for Track 1. Track 2 is designed for students seeking initial teacher licensure in early childhood education (pre-K through grade 3). This program is based on an undergraduate degree in child development or equivalent coursework. A non-thesis option is available in Track 2.

Track 1 - All students in the child development concentration must enroll in CFS 510, 511, and 571. At least 6 hours in a cognate area outside the department must be completed.
The thesis students are required to take: 3 hours of 500-level research methods; 3 hours of 500-level statistical methods; CFS courses in the area of concentration; 6 hours of thesis credit; and an oral comprehensive examination. Non-thesis students are required to take 3 hours of 500-level research methods, statistical methods, or interpretation of methods and statistics; CFS 566; 9 hours of CFS courses in the area of concentration; and a written comprehensive examination.

Track 2 - All students in the early childhood education licensure program must enroll in Human Ecology 574, 575, 591, and Holistic Teaching (a 505 or equivalent CFS course). Students select 3 hours from CFS 510, 511 or 512; three courses from CFS 511, 520, 521, 522, 530, 540, 525, 590; 3 hours of 500-level statistical methods or interpretation of statistics or research methods (requirement may be met with CFS 570); and written comprehensive examination (36 hours).

The family studies concentration consists of specializations in family life intervention and family science. Thesis and non-thesis options are available. Students should also consider an interdisciplinary minor in gerontology to provide a life span perspective to human development or family studies.

Students in the family studies concentration must enroll in CFS 550, 571, and 540 or 560. At least 6 hours in a cognate area outside the department are required. Thesis students are required to take: 3 hours of 500-level research methods; 3 hours of 500-level statistical methods; 6 hours of CFS courses in an area of concentration; 6 hours of thesis credit; and an oral comprehensive examination. Non-thesis students are required to take: 3 hours of 500-level research methods, statistical methods, or interpretation of methods and statistics; CFS 566, 565; 9 hours of CFS courses in the area of concentration; and a written comprehensive examination.

Students seeking the M.S. with a major in Child and Family Studies are required to file a plan of study with the department head after 15 hours of graduate credit have been completed.

THE PH.D. CONCENTRATION

The doctoral program in Human Ecology prepares scholars in the concentration areas of child development and of family studies. The strength of the doctoral program is based on three major components: the integration of child development and family studies within the context of human ecology and related areas, concentration in child development or family studies, and an emphasis on becoming proficient producers and consumers of research. A doctoral program that is concurricularly specialized and integrative in nature reflects the complexity of the disciplinary, subfield, and subject matter, provides a broader context to formulate theoretical questions, and broadens the empirical literature for addressing those questions.

Requirements include:
1. Minimum 13-16 hours in child development and family studies required foundation courses: 510, 550, 570, 571; 511 and 630 (child development area); or 634 (family studies area).
2. Minimum 12 hours in 500- and 600-level courses in child development or family studies, with at least 3 hours in 600-level courses (in addition to the required courses described in #1);
3. Minimum 6 hours in a cognate area;
4. Minimum 9 hours in graduate-level statistics; and at least 3 of these hours in a more specialized area than a sequence of survey courses;
5. Minimum 3 hours of specialized research methods;
6. Pre-doctoral research project approved by student’s committee;
7. Minimum 8 hours of electives.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state basis. The M.S. in Child and Family Studies (concentration in family studies only) is available to residents of Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

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

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

505 Development of Interpersonal and Supervision Skills (2) Refinement of interpersonal skills needed to work with families and other professionals. Supervisory training in others’ skill development, active listening, self-disclosure, relationship building, and negotiation.

510 Theory in Child Development (3) Theoretical models in child development (conception through adolescence); application to research, intervention and education. Prereq: 9 hrs of either upper division undergraduate or graduate social science or consent of instructor. F

511 Survey of Research in Child Development (3) Classic and contemporary research literature in child development from conception through adolescence. Prereq: 510 or equivalent or consent of instructor. S

512 Survey of Research in Early Childhood Education (3) Current literature and issues in early childhood education. Prereq: 510 or equivalent or consent of instructor.

515 Children in Contemporary Society (3) Theory and research on environmental and developmental issues in contemporary family situations and educational environments for children from infancy through middle childhood. Implications for programs and policy.

520 Curriculum and Program Development Early Childhood Education (3) Theoretical foundations of early childhood education: description, analysis and evaluation of curriculum models, teaching methods, administrative style, and supervision of personnel. Experience in designing and evaluating early childhood programs for young children in special needs, infancy-age 8. Prereq or coreq: 510 or 512.

521 Organizational Management in Early Childhood Education (3) Designing, implementing, and evaluating physical and human resources in educational environments. Development of skills in environmental organization, interpersonal leadership, and supervision of staff. Prereq: 512 or equivalent or consent of instructor.

525 Naturalistic Interventions for Parents and Teachers of Young Children (3) Common problems faced by parents and teachers; methods available to modify problem behavior; Prereq: 510 or equivalent or consent of instructor.

526 Seminar on Play (3) Comparison and contrast of theoretical framework and research methodologies on play. Developmental perspective on play.

530 Families of Handicapped Children (3) Developmental nature of families’ experiences in caring for handicapped children, especially during infancy and early childhood. Prereq: 510 or consent of instructor.

540 Parent-Child Relations (3) Influence of parents on children, influence of children on parents, reciprocal interaction between parents and children, applications of systems models, child abuse, and impact of divorce on children. Prereq: 550 or equivalent or consent of instructor.

550 Survey of Theory and Research in Family Studies (3) Use of family conceptual frameworks and application of theoretical models in research and family life programs.

552 Advanced Family Diversity (3) Diversity in family configurations in contemporary U.S. society. Variations of family patterns by race, ethnicity, religion, and social class; social dynamics of family formation, composition, and patterning. Prereq: 550. F, A

555 Children, Divorce and Remarriage (3) Children's and adolescents' adjustment to transitions involved in parental divorce, single-parenthood, and remarriage. Prereq: 550 or equivalent or consent of instructor.


563 Family Life Education Programs (3) Planning, implementing and evaluating programs in marital, parent, and family relationships, and parenthood education. Cons of instructor. (Same as Human Ecology 563.)

564 Practicum in Human Development or Family Studies (3) School and community programs. Education for human development and family living. Prereq: Consent of instructor. (Same as Human Ecology 564.)

565 Practicum in Human Development or Family Studies (I-3) School and community programs concerned with education for human development and family living. Prereq: 564 and approved supervised written project. Prereq: 564 and consent of instructor. S/N only. E

566 Approaches to Family Intervention and Counseling (3) Various theoretical approaches for family intervention and counseling. Structural, strategic, experiential and social learning schools of practice. Effects of intervention from perspective of their impact on family functioning and family education. Prereq: 562. (Same as Counselling Education and Counseling Psychology 566.)

567 Family Violence (3) Theory and research on initiation, maintenance and cessation of violent behaviors in intimate family contexts; and assessment of responses to violent family behaviors, perpetrators, victims, and family systems. Prereq: 550. F, A


571 Research Seminar (1) Presentation and critique of research projects. Prereq: Departmental major or consent of instructor. May be repeated. S/N only. E

580 Special Topics in Human Development or Family Studies (I-3) Research, theory and current issues in child development or family studies: divorce, handicapped children, women in families, work and family, parenting, mainstreaming children, research in human sexuality, cognition. Prereq: 6 graduate hrs in major, or consent of instructor. May be repeated with different topics. Maximum 9 hrs. E

581 Directed Study in Human Development or Family Studies (1-3) Individual learning experiences in specific topics in child development and early childhood education or family studies. Prereq: 6 graduate hrs or consent of instructor. May be repeated with different topics. Maximum 6 hrs. E

590 Assessment of Development and Learning in Young Children (3) Theory, empirical research and practices related to measurement of development and learning in young children.

600 Doctoral Research and Dissertation (3-15) P/NP only. E
Advanced Topics in Human Development or Family Studies (1-3) Study of research and theory related to current issues. Prereq; 12 graduate hours in major or consent of instructor. May be repeated with different topics. Maximum 6 hrs.

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.

Advanced Developmental Processes (3) Socioemotional, cognitive/language development during infancy and childhood. Normative and nonnormative development. Prereq; 120 hours or equivalent or consent of instructor. May be repeated with different topics. Maximum 6 hrs.

Adolescent Development in Families (3) Normative and nonnormative adolescent development: physical, cognitive, moral, social, familial, sexual, and personality development. Prereq; 120 hours or equivalent or consent of instructor. May be repeated with different topics. Maximum 6 hrs.

Survey Design and Analysis (3) Game as Sociology 633.)

Advanced Survey of Family Theory and Research (3) Conceptualization, analysis, and critical assessment of pertinent theoretical and empirical literature at an advanced level for variety of contemporary family issues. Prereq; 500, 550, 570 or equivalent research methods course. Sp, A

Men and Families (3) Contemporary American men: primary psychological processes in sociological context. Reciprocal influence of society, men, and their families in relation to marriage and parenting. Prereq; 9 hrs of graduate family studies coursework. F, A

Women and Families (3) Contemporary American women: primary psychological processes in sociological context. Reciprocal influence of society, women, and their families in relation to marriage and parenting. Prereq; 9 hrs of graduate family studies coursework. Sp, A

Assessment of Family Behavior (3) Analysis of methods and measures used in family science research. Prereq; 550, 571, 3 hrs graduate statistics, or consent of instructor.

The Department of Civil & Environmental Engineering offers degrees leading to the Master of Science and Doctor of Philosophy with a major in Civil Engineering concentrating in construction engineering, environmental engineering, geotechnical/materials engineering, public works engineering, structural engineering, and transportation engineering; to the Master of Science in Environmental Engineering with concentrations in water quality, water resources, air quality, mixed waste management, and environmental risk assessment.

The Master's Program

The Master of Science programs in Civil Engineering and Environmental Engineering are offered to graduates of recognized undergraduate curricula.

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. Prereq; 510 or equivalent or consent of instructor. May be repeated with different topics. Maximum 6 hrs.

Non-Thesis Option: A minimum of 33 semester hours of approved graduate coursework is required. The student must present a minimum of 33 semester hours of approved graduate coursework. The major shall include 12 semester hours of thesis. A minor may be selected but is not necessarily required.

The Department of Civil and Environmental Engineering offers both thesis and non-thesis options for work toward the Master of Science degree in Environmental Engineering.

Thesis Option: The student must present a minimum of 30 semester hours of approved graduate coursework. The major shall include 12 semester hours of thesis and a minimum of 12 semester hours of approved environmental engineering coursework. A minor may be selected but is not necessarily required.

Non-Thesis Option: The student must present a minimum of 33 semester hours of approved graduate coursework. The major shall include a minimum of 18 semester hours of approved environmental engineering coursework. A minor may be selected but is not necessarily required.

Either option must be approved by the student's major professor. A student's program must include a minimum of 9 semester hours of advanced engineering design courses selected from a list provided by the student's committee.

Normally, the graduate program of study will be adjusted by the head of the department and the student's committee to suit the individual academic objectives.

The Doctoral Program

A graduate program leading to the Doctor of Philosophy is offered in Civil Engineering. Specific departmental requirements for the Ph.D. degree include the following:

1. A minimum of 72 semester hours beyond the Bachelor's degree, exclusive of credit for the M.S. thesis. This number is a minimum of 24 semester hours in 600 Doctoral Research and Dissertation will be required.

2. A minimum of 24 semester hours of graduate courses in civil engineering, exclusive of thesis or dissertation credit, at least 6 hours of which must be 600-level courses.

3. Supporting courses in related scientific and engineering fields, amounting to approximately 24 semester hours, subject to approval by the student's faculty committee. These related fields will normally include such disciplines as mechanics, chemistry, mathematics, microbiology, physics, and other engineering fields. A minimum of 9 semester hours of mathematics must be included beyond the civil engineering undergraduate requirements.

4. One foreign language if the student's faculty committee feels that a reading knowledge of a foreign language is crucial to the student's research efforts.

5. 24 hours of approved courses. The student must pass a comprehensive examination.

6. After completion of the dissertation, prior to graduation, each student must pass a comprehensive examination administered by a faculty committee.

Minor in Environmental Policy

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

Academic Common Market

An agreement among southern states for sharing graduate programs allows legal
residents of some states to enroll in certain programs at UT Knoxville on an In-state tuition basis. The M.N. program in Environmental Engineering (concentration in air quality or waste management) is available to residents of the state of Alabama. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

Civil Engineering

GRADUATE COURSES

421 Portland Cement and Asphaltable Concrete (3) Aggregate characteristics and proportioning of Portland cement concrete; mix design methods for concrete; tests on Portland cement concrete admixtures; tests of asphalt and asphalt mixes; and nondestructive testing. Prereq: 321. 2 hrs and 1 lab.

451 Highway Engineering (3) Design, construction, operation, and maintenance of highway facilities; application of various engineering principles and techniques to the process of planning, locating and design of highway facilities; basic geometric and pavement design. Prereq: 210, 251, 252.

452 Traffic Engineering (3) Characteristics of drivers, roadway, and their interaction; traffic studies; basic considerations of traffic circulation and control; lighting, capacity, analysis, roadway safety analysis and design. Prereq: 210, 251, 252.

453 Airport/Railroad Planning and Design (3) Airport master planning and railroad engineering. Runway configuration, airfield capacity, geometrics and terminal layout and design, railroad capacity, geometrics and system layout and design. Prereq: 210, 251, 252.

461 Analysis of Framed Structures (3) Maximum stress due to moving loads; use of influence lines; lateral forces due to earthquake and wind. Analysis of portal, building frames, and space frames; matrix methods; use of computer in structural analysis. Prereq: Structural Analysis II.

472 Steel Design (3) Design of plate girders and composite beams; consideration of members subjected to combined stresses; design of typical framed building connections. Prereq: 471.

474 Reinforced Concrete Design (3) Reinforced concrete continuous beams and floor slabs, columns with combined axial and bending, footings and retaining walls. Prereq: 471.

485 Principles of Hydrogeology (3) (Same as Geologic Sciences 485.)

490 Water Resources Project Design (3) Coherent development of multipurpose reservoir and dam project; data acquisition; spillway and outflow works; earth and gravity dam stability analyses; drains and filters; maintenance and operation principles; and site safety concepts, dam break analyses. Prereq: 390, 395.

494 Urban Drainage Engineering (3) Design and management of stormwater conveyance and control structures. Application of hydraulic and hydrologic principles to design of drainage systems for urban, suburban, and highway development; design of inlet structures, ditches, culverts, and detention/retention basins; application of computer in runoff models; evaluation of land-use on streamflow quantity and quality. Prereq: 390, 395.

495 Water Resources Development and Management (3) Principles of water resources project development planning and management; decision making framework; water law, evaluation procedures for comparing and selecting among water resources development alternatives, multi-objective planning, principles of engineering economics, benefit-cost analysis, and cost allocation methods; environmental impact assessment procedures; decisions using risk-based methods; case studies. Prereq: 490, Senior standing.

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

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

510 Urban Systems: Engineering and Management (3) Various urban systems usually under responsibility of city manager and engineer: characterization and design of sewer, water, sewerage, refuse collection. Personnel management, finance, planning and public relations. Prereq: Graduate standing or consent of instructor.

512 Pavement Design (3) Empirical and theoretical based methods; pavement design and analysis; strengthening existing pavements; pavement distress and economical design alternatives. Prereq: 321 and 330.


531 Soil Stabilization (3) Mechanical stabilization of soils by compaction, drainage, and blending; chemical stabilization of soils with admixtures, waterproofing and modifying soils and additives. Reinforced earth and stabilization with geosynthetics. Prereq: Introduction to Soil Behavior.


534 Geological Engineering (3) Influence of geologic origin and history on engineering characteristics of rocks and soils; application of geology in planning, design, and construction of civil engineering projects. Prereq: Introduction to Soil Behavior 2 hrs and 1 lab.


537 Issues in Geotechnical Engineering (1-3) Special readings, problems, discussions, and presentations in geotechnical engineering. Prereq: Graduate standing or consent of instructor. May be repeated.

538 Finite Element Applications in Geotechnical Engineering (3) Applications of finite element method to typical problems in geotechnical engineering. Confinement and unconfined flow through porous media; stresses and strains in elastic halfspace; representation of nonlinear soil behavior with elastic and elastoplastic models; soil structure interaction effects. Prereq: Introduction to Soil Behavior and 551.

539 Geotechnical Seminar (1) Seminar topics in geotechnical and geological engineering. Research contributions and case histories by graduate students and engineers and scientists from surrounding community. Prereq: Graduate standing and consent of advisor. May not apply toward degree. May be repeated. S/N/C 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 and organization of heavy and building construction projects. Prereq: Construction Methods and Equipment.

543 Construction Estimating (3) Project costs, estimating and negotiation techniques, market cost conditions, and feasibility of design to cost. Prereq: Construction Methods and Equipment.

551 Traffic Engineering-Characteristics (3) Vehicle-roadway system; traffic flow modeling; elements of transportation/highway safety. Prereq: Graduating senior standing.

552 Traffic Engineering-Operations (3) Signs, signals and traffic control; short-term capacity; peak hour demand; signal timing/phasing; one-way reversible flow; system operations; identification and correction of high-accident locations and system deficiencies. Prereq: 551 or 452.

553 Geometric Design and Layout of Roadways and Community Facilities (3) Functional and geometric design and urban and rural roads of all classes; subdivision layout and engineering; traffic calming principles and techniques for pedestrian safety; traffic signal design; street and crosswalk design; road surface treatment; parking. Prereq: 451 or consent of instructor.

554 Urban Transportation Planning (3) Transportation problems in urban areas; systematic planning for identifying existing and future problems; travel surveys and demand models; evaluation of alternatives; implementation tools; special topics: urban goods movement, transportation system management. Prereq: 302 or graduate standing.

555 Public Transit Planning (3) Characteristics of transit modes-conventional and paratransit; operational design of transit service route planning and scheduling; cost analysis; mode choice models; performance evaluation; transit surveys; organization and financing. Prereq: 554 or graduate standing.

556 Traffic Accident Reconstruction (3) Data collection and analysis as basis for accident prevention on control programs; roadside hardware design and crash testing. Prereq: 452 or graduate standing.

557 Transportation Planning and Operations with Micro-Computer Applications (3) Transportation system management technology, and application of microcomputers to analysis of transportation actions. Prereq: 551 and 556.

558 Planning and Transportation (3) Preparation of transportation as elements of comprehensive development plans. Analysis of relationships between various transportation modes and between transportation and other community uses. Use of planning process to existing travel patterns, modeling of demand, proposing alternatives and evaluation. Prereq: Graduate standing. (Same as Planning 537.)

561 Computer-Aided Structural Analysis (3) Fundamental concepts of computational methods used in structural analysis; matrix and Finite Element methods; practical application of structural analysis software. Prereq: Structural Analysis and Matrix Computation or equivalent.

563 Statically Indeterminate Structures (3) Deflections of beams and trusses, force methods; moment distribution and other displacement methods; secondary stresses. Prereq: 361.

565 Structural Dynamics (3) Analysis of free and forced vibrations, and transient response of structures having many degrees of freedom; earthquake behavior considered for structural systems; earthquake design and response of structures. Prereq: 561.

567 Structural Systems (3) Structural system analysis and design; dead, live, wind, and earthquake loads on buildings; critical and lateral load resisting systems; use of computers in analysis and design. 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.

573 Prestressed Concrete (3) Properties of prestressing materials; methods of prestressing and posttensioning; analysis and design of simple and continuous beams and slabs. Prereq: 471.

574 Behavior of Reinforced Concrete Members (3) Moment-curvature and load-deflection relationships for reinforced concrete beams; combined bending and axial load; shear and shear failure mechanisms. Prereq: Introduction to Structural Design.

575 Repair and Retrofitting of Structures (3) Technques, methods, and materials for repair and retrofitting of deteriorated or overstressed structures, foundation upgrading, retrofitting of steel fatigue failures. Prereq: 472.

576 Masonry Design (3) Clay and concrete masonry materials; reinforced masonry design; seismic behavior of masonry structures. Prereq: Introduction to Structural Design.

580 Risk Analysis in Civil and Environmental Engineering (3) Applications of probability theory and statistics in civil engineering disciplines: structures, geotechnology, water resources, transportation, and...
environmental engineering. Prereq: Calculus II or consent of instructor.

590 Special Problems in Civil Engineering (1-6)
Enrollment limited to civil engineering students. Approval of thesis programs. May be repeated. Maximum 6 hrs. S/NC only.

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

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

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. Prereq: 554 or 558.

652 Analysis Techniques for Transportation Systems II (3) Advanced topics of application of mathematical, statistical, and computer science techniques in modeling and analysis of transportation systems. Prereq: 651.

666 Reliability of Constructed Systems (3) Development of safety factors and probability based design codes. Monte Carlo methods; constructed system reliability; evaluation of existing infrastructures. Prereq: 580. Introduction to Structural Design or consent of instructor.

671 Behavior of Steel Bridges and Buildings (3) Behavior, analysis and design of plate girders, columns, and composite members subjected to static and dynamic loading. Prereq: 571.

674 Behavior of Reinforced Concrete Beams and Slabs (3) Strength and behavior of statically indeterminate reinforced concrete beams and frames; limit analysis; behavior, analysis, and design of reinforced concrete slabs; partial factor limit state design, finite element solutions, and ACI Code Method. Prereq: 574.

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

Environmental Engineering

GRADUATE COURSES

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

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

508 Seminar (1) Reports on current research in environmental engineering at UTK. Prereq: Graduate standing.

510 Environmental Protection (3) Managing of water resources, wastewaters, air quality, solid wastes, and hazardous materials to promote efficiency and comfort and to safeguard balances in natural ecosystems. Prereq: Consent of instructor.

520 Open Channel Hydraulics (3) Open channel flow principles, properties, and classifications; uniform and gradually varied flow theory and applications; open channel design; unsteady flow theory and analysis; dynamic routing; spatially varied flow; non-linear flow; sediment transport; microcomputer applications, featuring HEC-2 model. Prereq: Civil Engineering 390.

522 Floodplain and Urban Flood Management (3) Review of national, regional, and local flood problems; state of the art flood damage reduction alternatives: structural and non-structural, institutional responses; policies, programs, organizations, regulations, and legal aspects; floodplain hydrology and hydraulics; HEC-1, HEC-2: floodway encroachment, flood hazard zone and damage potential determinations; case studies. Prereq: Civil Engineering 390 or consent of instructor for non-majors.

524 Sediment Transport (3) Sediment properties and measurements; principles of dynamics of suspended and bedsediment transport in erodible channels, erosion, transportation, and deposition of sediment by flowing water; erodible channel design; channel regime theory; common computer models. Prereq: Civil 390.

525 Soil Erosion and Sediment Yield (3) Theory of soil erosion and sediment yield from disturbed land; methods and computer models for estimating sediment yield. Erosion and sediment control theory and management programs, soil and water management programs. Prereq: Civil Engineering 395. (Same as Agricultural Engineering 525.)

530 Stormwater Modeling (3) Systems approach to stormwater modeling: Hydrologic and morphologic models; linear and nonlinear systems integrated into mathematical models of watershed response. Review and application of commonly used deterministic and parametric computer models. Prereq: Civil Engineering 395.


540 Remote Sensing for Transportation and Facilities Siting (3) Principles of remote sensing; sources of data and data acquisition systems; photography, interpretation, computer interpretation, analysis of spatial and non-spatial data for planning of transportation systems. Prereq: Consent of instructor.

541 Remote Sensing Data Acquisition and Analysis (3) Active and passive sensors; automated analog and digital analysis and interpretation of data; systems for mapping of transportation systems. Prereq: Consent of instructor.

543 Instrumentation and Measurement (3) (Same as Agricultural Engineering 543.)

545 Monitoring Hydrologic Phenomena (3) (Same as Agricultural Engineering 545.)

551 Physicochemical Unit Processes (3) Theory and design application in water and wastewater treatment. Prereq: Civil Engineering 390, and Civil Engineering 390.

552 Biological Treatment Theory (3) Theory and design application of biological processes to treatment of wastewater and solid wastes. Prereq: Civil Engineering 390. 2 hrs and 1 lab. (Same as Agricultural Engineering 552.)

553 Aquatic Chemistry (3) Theoretical, applied and analytical chemistry of water and wastewaters: measurement and treatment of environmental contaminants. Prereq: Chemistry 130. 2 hrs and 1 lab.

554 Environmental Engineering Chemistry (3) Application of chemical principles in analyzing physical, chemical, biological, and engineering problems of aquatic systems. Prereq: Consent of instructor.

555 Solid Waste Management (3) Quantitative and qualitative characteristics of solid waste problems; collection systems; design of disposal systems; landfills, incineration, and composting, design of resource recovery systems; current and future regulations. Prereq: Senior standing.

556 Hazardous Waste Management (3) Analysis and design of operating and processes for hazardous waste disposal and processing; regulations: analysis, industrial applications. Prereq: Graduate standing or consent of instructor.

557 Hazardous Wastes Site Remediation (3) Advanced study of processes for hazardous waste sites remediation: soil vapor extraction, soil washing, chemical destruction, thermal destruction, bioremediation. Prereq: 556 or consent of instructor. S/NC only.

570 Air Quality Management/Pollution Control (3) Introductory course on concepts of air pollution control; the analysis of relationships among sources, meteorology, effects, and public health. Prereq: Consent of instructor.

571 Design of Air Pollution Control Systems (3) Design and evaluation of systems used to control emission of gaseous and particulate air pollutants. Compre-

Classics

(Complete of Arts and Sciences)

Susan D. Martin, Head

Professors:

Gesell, G. C., Ph.D. ....................... North Carolina
Rutledge, H. C. (Emeritus), Ph.D. ...... Ohio State
Tandy, D. W., Ph.D. ..................... Yale

Associate Professors:

Craig, C. P., Ph.D. ........................ North Carolina
Martin, S. D., Ph.D. .................... Michigan
Shelton, J. E., Ph.D. ..................... Vanderbilt

Assistant Professor:

Sutherland, E. H., Ph.D. ................ UC Berkeley

The graduate courses in the Classics include the wider reading of Greek and Latin authors in a selected field, a more detailed study of one of the great genres of classical literature, and the development of background for the appreciation of Greek or Roman life and literature.
GRADUATE COURSES


405-05 Selected Readings from Greek Literature (3,3) For advanced students in Greek, plays, historical writings, poetry of ancient Greece in original Greek. Prereq: 401-402 or consent of instructor. May be repeated. Maximum 9 hrs.

414 Cicero and Techniques of Latin Prose Composition (3) For advanced students in Latin, practice in prose composition, writings of Cicero the model. Prereq: 351-352 or consent of instructor. Maximum 9 hrs.

431-32 Selected Readings from Latin Literature (3,3) For advanced students in Latin, oratory, historical writings, poetry of ancient Rome in original Latin. Prereq: 351-352 or consent of instructor. May be repeated. Maximum 9 hrs.

435 Medieval Latin (3) Selected readings from Latin prose and poetry of medieval Europe. Prereq: Consent of instructor.

441 Special Topics in Classical Civilization (1-3) Art, literature, religion, and society of Greece and Rome. May be repeated with consent of department. Maximum 9 hrs.

451 Studies in Classical Archaeology (3) Variable content course offering subject matter not taught in an existing course, or concentrating on one aspect of existing survey. Prereq: According to topic. May be repeated. Maximum 9 hrs.

462 Roman Law (3) Development of Roman law through examination of cases from writing of Roman jurists, world's first legal professionals. Understanding legal institutions in relationship to Roman society. Roman property and contract law.

561 Special Topics in Classical Civilization (1-3) Advanced tutorial of instructor and Roman authors in English translation; problems in cultures of Greece and Rome. May be repeated. Maximum 9 hrs. Letter grade or S/NC.

Communications

(College of Communications)

MAJOR DEGREES

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

The College of Communications offers the Master of Science and the Doctor of Philosophy degrees with a major in Communications. In addition to the full-time program, the M.S. degree program is offered on an evening basis in Knoxville, and via distance education, at Chattanooga on the University of Tennessee at Chattanooga campus and at Martin on the University of Tennessee at Martin campus.

For application forms and other information about the M.S. and Ph.D. programs in Communications, write to: Associate Dean for Graduate Studies, College of Communications, 426 Communications Building, The University of Tennessee, Knoxville, TN 37996-0347.

ADMISSION REQUIREMENTS

Applicants must meet admission requirements of The Graduate School. In addition, they must complete the Graduate Record Examination, rating forms, and application forms as required by the College of Communications. Minimum requirements for admission to full potential candidate status normally include a 3.0 (4.0 system) grade-point average in undergraduate studies and scores at or above the fiftieth percentile in verbal, quantitative and analytical aptitude on the Graduate Record Examination. All application materials are screened by an admissions committee authorized by the faculty of the College of Communications.

New students normally are admitted to the programs only at the beginning of fall semester. However, under special circumstances, a student may be admitted at the beginning of spring semester in a temporary non-degree status. Applications for fall admission must be received by May 1. Applications for financial aid are due by March 1.

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, 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 student status:

1. A 3.0 (4.0 system) grade-point average in undergraduate studies, and 3.5 for graduate work in a master's degree;
2. at or above the fiftieth percentile in verbal, quantitative and analytical aptitude on the Graduate Record Examination;
3. endorsement by at least three former teachers or professional colleagues; and
4. a statement of the applicant's goals and reasons for pursuing the doctorate. Personal interviews with members of the Ph.D. Admissions Committee are recommended and may be required. Professional experience in some field of communications is a highly desirable criterion for admission.

A minimum of 88 hours of approved graduate work is required for the Ph.D.

1. Twenty-eight hours of core courses--Communications 510, 512, 540, and 550 or 560, the first three of which must be taken during the first two semesters of the student's program, except with written approval of the Associate Dean for Graduate Studies for the College.
2. Twelve hours within one department of the college, at least 6 hours at the 500 level or above. An internship, if needed, is included.
3. Three hours for the thesis option and 9 hours for the non-thesis option of electives from a list provided by the department in area of concentration.
4. Six hours of thesis work (Communications 590), including a thesis seminar, or a 3-hour project (Communications 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 communications law is a prerequisite.

A student's internship experience requires approval by his/her advisor. Credit will be given through Advertising 596, Broadcasting 596, Journalism 596, or Public Relations 598 on the basis of 3 hours of credit for the equivalent of 15 weeks of full-time professional experience. This credit is to be included in the hour requirements for the M.S. program. Previous professional experience will be evaluated by the student's committee.

Students interested in subsequent entry into a doctoral program are advised to pursue the thesis option and to take additional courses in communications theory and research, subject to advisor's approval.

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

THE DOCTORAL PROGRAM

The Ph.D. with a major in Communications is intended to prepare scholars for teaching, research, administration, and service in the field of mass communications. 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.

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, 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 student status:

1. A 3.0 (4.0 system) grade-point average in undergraduate studies, and 3.5 for graduate work in a master's degree;
2. at or above the fiftieth percentile in verbal, quantitative and analytical aptitude on the Graduate Record Examination;
3. endorsement by at least three former teachers or professional colleagues; and
4. a statement of the applicant's goals and reasons for pursuing the doctorate. Personal interviews with members of the Ph.D. Admissions Committee are recommended and may be required. Professional experience in some field of communications is a highly desirable criterion for admission.

A minimum of 88 hours of approved graduate work is required for the Ph.D.

1. Twenty-eight hours of core courses--Communications 510, 512, 540, and 550 or 560, the first three of which must be taken during the first two semesters of the student's program, except with written approval of the Associate Dean for Graduate Studies for the College.
2. Twelve hours within one department of the college, at least 6 hours at the 500 level or above. An internship, if needed, is included.
3. Three hours for the thesis option and 9 hours for the non-thesis option of electives from a list provided by the department in area of concentration.
4. Six hours of thesis work (Communications 590), including a thesis seminar, or a 3-hour project (Communications 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 communications law is a prerequisite.

A student's internship experience requires approval by his/her advisor. Credit will be given through Advertising 596, Broadcasting 596, Journalism 596, or Public Relations 598 on the basis of 3 hours of credit for the equivalent of 15 weeks of full-time professional experience. This credit is to be included in the hour requirements for the M.S. program. Previous professional experience will be evaluated by the student's committee.

Students interested in subsequent entry into a doctoral program are advised to pursue the thesis option and to take additional courses in communications theory and research, subject to advisor's approval.

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

THE DOCTORAL PROGRAM

The Ph.D. with a major in Communications is intended to prepare scholars for teaching, research, administration, and service in the field of mass communications. 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.

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, 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 student status:

1. A 3.0 (4.0 system) grade-point average in undergraduate studies, and 3.5 for graduate work in a master's degree;
2. at or above the fiftieth percentile in verbal, quantitative and analytical aptitude on the Graduate Record Examination;
3. endorsement by at least three former teachers or professional colleagues; and
4. a statement of the applicant's goals and reasons for pursuing the doctorate. Personal interviews with members of the Ph.D. Admissions Committee are recommended and may be required. Professional experience in some field of communications is a highly desirable criterion for admission.

A minimum of 88 hours of approved graduate work is required for the Ph.D.

1. Twenty-eight hours of core courses--Communications 510, 512, 540, and 550 or 560, the first three of which must be taken during the first two semesters of the student's program, except with written approval of the Associate Dean for Graduate Studies for the College.
2. Twelve hours within one department of the college, at least 6 hours at the 500 level or above. An internship, if needed, is included.
3. Three hours for the thesis option and 9 hours for the non-thesis option of electives from a list provided by the department in area of concentration.
4. Six hours of thesis work (Communications 590), including a thesis seminar, or a 3-hour project (Communications 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 communications law is a prerequisite.

A student's internship experience requires approval by his/her advisor. Credit will be given through Advertising 596, Broadcasting 596, Journalism 596, or Public Relations 598 on the basis of 3 hours of credit for the equivalent of 15 weeks of full-time professional experience. This credit is to be included in the hour requirements for the M.S. program. Previous professional experience will be evaluated by the student's committee.

Students interested in subsequent entry into a doctoral program are advised to pursue the thesis option and to take additional courses in communications theory and research, subject to advisor's approval.

After completion of the formal program of coursework and research for the thesis option, the student must pass an oral examination conducted by his/her graduate committee. The non-thesis option requires a written comprehensive examination and an oral defense of the project.
 sciences, journalism, public relations, or speech communication) supplementing the core. Courses may be taken in one or more of the Departments of Advertising, Broadcasting, Speech Communication, and/or the Schools of Information Sciences and Journalism.

3. Twelve hours in a secondary concentration (outside the College of Communications).

4. Nine hours from the graduate program listed in (1) and (2).

5. Twenty-four hours of dissertation.

All courses require the approval of the student's advising committee.

Admission to candidacy must be attained at least two semesters prior to graduation and requires successful completion of a written comprehensive examination.

Each doctoral student's progress will be reviewed annually by the Doctoral Committee of the College of Communications. Results will be reported to the student by his/her program advisor, who will convey the committee's recommendation concerning the student's remaining in the program (notion). Prereq: Consent of instructor or admission to program. F

510 Orientation to Master's Studies (1) Degree and thesis requirements. Committee formation and program planning. Overview of research methods and informational sources. Prereq: Consent of instructor or admission to program. S

512 Mass Media Research Methods (3) Applications of research methodology to the study of mass media. The student is expected to design and conduct an original research study. Prereq: Consent of instructor or admission to program. F

521 Tutorial in Communications Teaching (1) Experience as teacher under guidance of faculty members. Prereq: Consent of instructor. S/N only. E

540 Communications Theory (3) Selected research hypotheses and theories in the literature of mass communications. Prereq: Consent of instructor or admission to program. F

541 Orientation to Doctoral Research (1) Degree and thesis requirements. Committee formation and program planning. Overview of research methods and informational sources. Prereq: Consent of instructor or admission to program. S

545 Advanced Topics in Communications Theory and Methodology (3) Advanced study of theoretical and methodological issues in the field of mass communication. Prereq: Consent of instructor or admission to program. S

550 Seminar in Media Economics and New Technology (3) Economic and marketing problems of mass communication media and related industries. Prereq: Consent of instructor or admission to program. S

552 Seminar in Health Communications (3) Methods, problems, and issues of communication in the health field. Prereq: Consent of instructor or admission to program. S

553 Seminar in Risk Communications (3) Interactions of risk and mass media. Prereq: Consent of instructor or admission to program. S

560 Seminar in Communications Management (3) Organizational structure and functions of communications corporations and related industries. Prereq: Consent of instructor or admission to program. S

561 Seminar in Science, Society, and the Mass Media (3) Investigation of the role of science and technology in society. Prereq: Consent of instructor or admission to program. S

562 Seminar in Mass Communications Law and Legal Research (3) Legal restrictions under which mass media operate. Prereq: Consent of instructor or admission to program. S

593 Seminar in Mass Communications Issues (3) Contemporary topics in communications. Prereq: Consent of instructor. S

594 Seminar in Media Economics and New Technology (3) Advances in media economics and new technologies. Prereq: Consent of instructor. S

595 Seminar in Health Communications (3) Health communications and public health. Prereq: Consent of instructor. S

596 Seminar in Communications Management (3) Organizational structure and functions of communications corporations and related industries. Prereq: Consent of instructor. S

597 Independent Study (1-3) Reading, research, or projects on special topics in communications. Prereq: Consent of instructor. S

598 Independent Study (1-3) Reading, research, or projects on special topics in communications. Prereq: Consent of instructor. S

600 Doctoral Research and Dissertation (1-3) Prereq: Consent of instructor. S

610 Orientation to Doctoral Research (1) Degree and dissertation requirements. Committee formation and program planning. Overview of research methods and informational sources. Prereq: Consent of instructor or admission to program. S

612 Fundamentals of Research (3) Overview of research methodology. Prereq: Consent of instructor or admission to program. S

620 Seminar in Mass Communications Education (3) Role and scope of mass communications teaching unit, historical perspectives: curricular trends. Teaching methods and instructional objectives; classroom testing and measurement; design of professional curricula, research on instruction; program evaluation; research studies. Prereq: Consent of instructor or admission to program. S

621 Mass Communications History and Historiography (3) Origins and development of mass media in America. Prereq: Consent of instructor or admission to program. S
approved graduate students seeking training in this area and is especially useful for individuals with professional degrees. For the student with undergraduate biology or 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 interdisciplinary program, which pools faculty resources from both veterinary and human medicine, is broadened by faculty members representing animal science and numerous areas of the life sciences. The interdisciplinary training environment includes such diverse support as facilities and personnel at the Veterinary Teaching Hospital, UT Medical Center at Knoxville, the Oak Ridge National Laboratory, Knoxville Zoological Park, Hemophilia Clinic, Developmental and Genetic Center, Hematology and Oncology services, and departments of life sciences.

For additional information, write to the Office of Research and Graduate Programs, or access the website at http://cem.vet.utk.edu.

**ADMISSION REQUIREMENTS**

Admission requirements of The Graduate School of UT Knoxville apply. In addition, all applicants must furnish three letters of recommendation from individuals who are familiar with their scholarly or professional records.

**Master of Science Degree Program**

Applicants must have a baccalaureate degree with coursework in chemistry through organic, mathematics through calculus, physics, and basic biology. More advanced study in biology such as biochemistry, mammalian anatomy, histology, cell biology, or other appropriate biomedical courses from an accredited university is recommended.

Applicants for admission to the Master of Science degree program whose background include 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.

**Doctor of Philosophy Degree Program**

Applicants generally will be expected to have a master's degree in one of the biological sciences and a Graduate Record Examination score of at least 1000 for the quantitative and verbal sections, or a professional degree in one of the medical sciences, e.g., M.D., D.D.S. D.V.M.

An individual having a baccalaureate degree with a strong background in the physical and biological sciences may be admitted upon presenting evidence of exemplary performance on the Graduate Record Examination.

Exceptional veterinary students at UT Knoxville may be admitted to the Comparative and Experimental Medicine graduate program but will be enrolled officially as veterinary students. During summers such students may take advantage of registering for graduate courses to be counted as elective courses in the veterinary program.

**THE MASTER'S PROGRAM**

All students must take at least 4 credit hours in 500- or 600-level courses in basic mechanisms of disease and at least 7 credit hours of 500-level biochemistry or cell biology. See listings under Biochemistry and Cellular and Molecular Biology program for information on these courses. In addition, students must complete a minimum of 8 hours of coursework in a specified discipline, 5 or more hours of electives, and 6 hours of Thesis 500. Exceptions to accommodate students with specific interests must be approved by the joint Graduate Coordinating Committee after application, in writing, to the director. The graduate committee (at least 3 members) is chosen after the first term and must include at least one member from the College of Veterinary Medicine and at least one member from the Graduate School of Medicine. If a minor is declared, one member must be from the minor discipline.

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

**THE DOCTORAL PROGRAM**

All students must take at least 4 credit hours in 500- or 600-level courses in basic mechanisms of disease and at least 7 credit hours of 500-level biochemistry or cell biology. See listings under Biochemistry and Cellular and Molecular Biology program for information on these courses. In addition, students must complete a minimum of 8 hours of coursework in a specified discipline. Exceptions to accommodate students with specific interests must be approved by the joint Graduate Coordinating Committee after application, in writing, to the director. Areas of emphasis may include hematology, oncology, comparative pathology, comparative pharmacology, toxicology, immunology, genetics, infectious diseases, or biochemistry of disease. At least 24 hours of coursework, including a minimum of 6 hours at the 600 level, and 24 hours of Dissertation 600 are required for a total of 48 hours. For students with professional degrees, a minimum of 18 hours of coursework beyond the professional degree is required for a total of 42 hours.

The doctoral committee (at least 4 members) is chosen during the first year. Three of the four members, including the chair, must be approved by the Graduate Council to direct doctoral research. At least one member must be from the College of Veterinary Medicine and at least one member from the Graduate School of Medicine.

A comprehensive examination is given at the completion of coursework. A seminar and final oral defense of the dissertation culminate the program.

**ACADEMIC COMMON MARKET**

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The Ph.D. program is available to residents of the state of Florida. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

**Comparative and Experimental Medicine—Graduate School of Medicine**

**GRADUATE COURSES**

Participating departments include: Anesthesiology, Medicine, Medical Biology, Obstetrics and Gynecology, Pathology, Pediatrics, Radiology, and Surgery.

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

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

506 Graduate Research Participation (3) Advanced research techniques while conducting individual biomedical research projects under supervision of faculty. Open to all graduate students. Prereq: Consent of instructor. May be repeated with consent of instructor. Maximum 8 hrs. S/N only. E

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

541 Molecular Basis for Metabolic Disease (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. F, A

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

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

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

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. (Same as Biochemistry and Cellular and Molecular Biology 611.) F, Sp

652 Special Topics in Pathology (1-3) Pathologic anatomy, biochemical pathology, and related areas. Primarily for doctoral candidates in Comparative and Experimental Medicine. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. F, Sp

**Comparative and Experimental Medicine—Veterinary Medicine**

**GRADUATE COURSES**

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

500 Thesis (1-15) P/NP only. E
501 Special Topics in Comparative and Experimental Medicine (1-4) Specialized experience in comparative and experimental medicine. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

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

503 Predictive Toxicology (3) Principles and techniques of predictive toxicity, structure-activity-relationships, expert systems, neural nets and molecular similarity. Sp, A

505 Laboratory Animal Care and Use (2) Review of basic laboratory animal care and use as prerequisite to conducting research using animal subjects. Compliance issues and techniques. F

506 Experimental Animal Surgery (3) Competency in performing humane surgical modifications of experimental animals. Techniques of anesthesia. Drug administration and postoperative care. Prereq: Embryology, parasitology, physiology, and/or consent of instructor. 1 hr and 2 labs. F

530 Wildlife Diseases (2) (Same as Wildlife and Fisheries Science 530.) F, A

536 Toxicology (2) (Same as Veterinary Medicine 536.) F

538 Nutritional Aspects of Companion Animal Health (2) (Same as Animal Science 538.) F

551 Mammalian Organology (3) (Same as Animal Science 551.) F

552 Anatomy of Domestic Carnivores (4) (Same as Animal Science 552.) F

554 Comparative Hematology (3) (Same as Animal Science 554.) Sp, A

561 Pharmacology (4) Principles of pharmacokinetics and pharmacodynamics properties of drugs: mode of action, pharmacokinetic effects, chemical and physical properties, metabolism, toxicology, important idiosyncrasies and clinical applications. Prereq: Consent of instructor. F

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

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

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

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. E

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

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

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

608 Descriptive and Applied Epidemiology (2) Principles of 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. F

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

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

651 Advanced Topics in Animal Anatomy (1-4) (Same as Animal Science 551.) F

652 Disorders of the Endocrine System (2) (Same as Animal Science 552.) Sp, A

### Comparative Medicine

See College of Veterinary Medicine and Comparative and Experimental Medicine

### Computer Science

(College of Arts and Sciences)

**DEGREES**

**MAJOR**

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

Robert C. Ward, Head

**Professors:**

- Dongarra, Jack, Ph.D. New Mexico
- Langston, Michael A., Ph.D. Texas A&M
- Poore, J. H., Ph.D. Georgia Tech
- Sherman, Gordon R. (Emeritus). Ph.D. Purdue
- Thomason, Michael G., Ph.D. Duke
- Ward, Robert C., Ph.D. Virginia

**Associate Professors:**

- Berry, Michael W., Ph.D. Illinois
- MacLennan, Bruce J., Ph.D. Purdue
- Vander Zanden, Bradley, Ph.D. Cornell
- Vose, Michael D., Ph.D. Texas

**Assistant Professors:**

- Gregor, Jens, Ph.D. Aalborg (Denmark)
- Pank, James S., Ph.D. Princeton
- Raghavan, Padma, Ph.D. Penn State
- Straight, David W., Ph.D. Texas

**Instructor:**

- Mayo, J. Wallace (Liaison), M.S., Tennessee

### THE MASTER'S PROGRAM

Two semesters of calculus plus two additional semesters of college mathematics (e.g., linear algebra, differential equations, probability) and a course in discrete structures and in systems programming are required for admission. For the master's degree, 30 semester hours of graduate credit are required, 24 of which must be 500 level or above. Computer Science 530, 560 and 580 are required for the degree. Graduate courses taken outside the department are sometimes allowed but must be approved by the Graduate Committee before enrollment.

### Thesis Option

The student must reach agreement on a thesis topic with a faculty advisor and must take 6 hours of 500 Thesis. Six hours of 500 Thesis may count in the 24-hour requirement at the 500 level or above.

### Non-Thesis Option

The student must take coursework in an area to prepare for the non-thesis master's examination. The student's advisor must verify that an acceptable set of courses has been taken before the student may schedule the examination. Information concerning the examination is available in the departmental office.

### Master's Minor in Computer Science

The graduate minor consists of any two of the three core courses (530, 560, 580) plus an additional 3 hours of graded computer science graduate-level courses at or above the 400 level.

### THE DOCTORAL PROGRAM

A student seeking admission to the Ph.D. program is expected to meet the following requirements:

1. The student should have three letters of recommendation sent directly to the department head from individuals capable of assessing the student's potential for advanced work in computer science (for example, college teachers or employers for whom the student has worked after earning a Bachelor's degree). The department reserves the right to contact these individuals or other knowledgeable people if additional information is deemed necessary or desirable.

2. The student is expected to have taken the GRE verbal and quantitative general test within the past three years and to have these scores sent to The Graduate School.

3. The student should satisfy the same background requirements as for the master's program. See the departmental brochure for details.

Original research reported in a dissertation of high quality is emphasized. The minimum hour requirements are 24 hours of courses 600 Doctoral Research and Dissertation and 24 hours of graduate courses beyond the equivalent of a master's degree (i.e., beyond 30 graduate credit hours) graded A-F. Computer Science 630, 560 and 580 are required for the degree. At least six hours of 600-level graded courses must be taken in computer science at UTK. 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.

### 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.
Consumer and Industry Services Management

(Majors in the College of Human Ecology)

MAJORS

Human Ecology ........................................ Ph.D.
Recreation, Tourism and Hospitality Management ........................................ M.S.
Textiles, Retailing and Consumer Sciences M.S.

Nancy B. Fair, Head

Professors: Breseth, Randall R. (Liaison), Ph.D. Florida State
Dyker, Kermi E., Ph.D. .......... Tennessee
Hayes, Gene A. (Liaison), Ph.D. .......... North Carolina

The Department of Consumer and Industry Services Management offers the master's degree with majors in Textiles, Retailing and Consumer Sciences, concentrations in textile science and in retail and consumer sciences; and in Recreation, Tourism and Hospitality Management, concentrations in therapeutic recreation, recreation administration, tourism, and hospitality management. An interdisciplinary program 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.

The programs in Consumer and Industry Services Management prepare students for careers in industry, business, public and private agencies, and educational institutions. Master's level work enables students to conduct research in retail management and merchandising and in the consumer areas related to retail decision making. Students in textile science are expected to have a solid foundation in mathematics, as well as a formal background in a physical science or engineering.

Interested students should contact the department head for more information.

ADMISSION REQUIREMENTS

A complete file for review includes the Graduate School application fee, Department of Consumer and Industry Services Management application, Graduate Record Examination (GRE) scores for the general section, and three Graduate School Rating Forms completed by individuals who can attest to the potential for graduate education. Forms may be obtained from the Dean's Office, College of Human Ecology.

In addition to specified entrance requirements stipulated by The Graduate School, admission to the master's degree program with a major in Textiles, Retailing and Consumer Sciences is dependent on completion of undergraduate courses that give the necessary background for success in the graduate program. For the concentration in retail and consumer science, students should have an adequate background in retailing and/or consumer science supported by coursework in economics, marketing, mathematics, and statistics. For the concentration in textile science, students should have a basic technical background in textile science or materials science supported by mathematics
through differential equations, organic chemistry, and general physics. Superior students deficient in one or more of the above requirements, may be admitted at the discretion of the department's graduate faculty.

THE MASTER'S PROGRAM

The requirements for the major in Textiles, Retailing and Consumer Sciences are listed below.

Retail and Consumer Sciences (Thesis)

Major (Required RCS courses): 510, 511, 541, 550, 562, 590
Cognate Area
Statistics
Thesis
Total
34

Electives

Total
36

Textile Science (Thesis Option)

RCS 552
Research Methods
TS 590
Textile Science courses
Cognate Area
Statistics
Thesis
Total
34

*Must include RCS 562 or equivalent; or 3 hours of laboratory techniques in materials analysis and characterization.

Textile Science (Non-Thesis Option)

Nonwovens Core
(Required TS courses: 510, 521, 526, 528, 585)
Related Courses
Statistics
Professional Project, TS 501
Total
30-33

The major in Recreation, Tourism and Hospitality Management requires 33-38 hours for the thesis option and 36-39 hours for the non-thesis option depending upon the specific concentration. For all thesis concentrations, individuals not possessing an undergraduate degree in the discipline or having appropriate full-time work experience will be required to take 590 (graduate internship).

Requirements for each concentration are:

Hospitality Management
All students (28 hours); Hotel and Restaurant Administration 532, 537, 542; Nutrition 541; Hotel and Restaurant Administration/Nutrition electives (12 hours); related area (6 hours); statistics (3 hours);
Thesis Option (6 hours): 500; Non-Thesis Option (9 hours): 590 (6 hours); elective (3 hours).
For a description of courses in the hospitality management concentration, see Nutrition.

Recreation Administration
All students (27 hours): 415 or 440, 510, 515, 540, 541; Safety Education 443; Sport Management 512; statistics (3 hours); research methods (3 hours);
Thesis Option (6 hours): 500;
Non-Thesis Option (9 hours): 590 (6 hours); elective (3 hours).

Therapeutic Recreation

All students (24 hours): 420 or 425, 510, 515, 520, 521, 522; statistics (3 hours); research methods (3 hours);
Thesis Option (9 hours): 590; elective (3 hours);
Non-Thesis Option (12 hours): electives (6 hours); 590 (3-6 hours).

Tourism

All students (30 hours): 470, 510, 515; Hotel and Restaurant Administration 532, 542; Marketing 510; Hotel and Restaurant Administration 555 or Planning 540; Planning 548 or 550; statistics (3 hours); research methods (3 hours);
Thesis Option (6 hours): RTM or HRA 500; Non-Thesis Option (9 hours): 590 (3-6 hours); elective (3-6 hours).

THE PH.D. CONCENTRATIONS

Retail and Consumer Sciences (Thesis)

Students enrolled in the Ph.D. program with a concentration in retail and consumer sciences are provided with a foundation in management and retail and consumer sciences to further their work and application in advanced study and research. Requirements are either 31 or 90 hours, depending upon whether students select a minor in statistics. Requirements include:

Major (RCS Required Courses): 614, 615, 625, 641, 651
Research Methods: 590, 616
Statistics
Cognate Area
Human Ecology 630
Electives
Dissertation
Total
15
9
3
5
12-15
Note: (1) Statistics hours must include Statistics 537, 538, 579. (2) Cognate hours must include at least 3 hours at the 600 level. (3) Students choosing to take a minor in statistics will take a minimum of 15 hours of prescribed statistics courses and are not required to take a cognate area.

Textile Science

Students enrolled in the Ph.D. program in Textile Science take one common course which provides a foundation for the integration of textiles and apparel in the context of the near environment. A required departmental research seminar exposes students to research being conducted in all areas of study in the department.

1. RCS 552 (3 hours);
2. Research Methods which must include 6 hours of laboratory techniques in materials analysis and characterization;
3. TS 590 (2 hours). Attendance at seminar is required for all full-time students;
4. Six hours in statistics at the 500-600 level;
5. Eighteen hours in textile science courses;
6. Nine hours in a cognate area;
7. Fourteen hours of other courses which may include up to 8 hours of dissertation; and
Note: Students must take a minimum of 9 hours at the 600-level in the College of Human Ecology, exclusive of dissertation. Transfer students with a Master's degree from another institution are required to complete at least 42 hours (including dissertation hours) from UTK.

ACADEMIC STANDARDS

1. Evaluation of student progress will normally occur prior to enrollment for thesis hours (or the non-thesis option) and during the second semester of full time enrollment in the program. The review of the student will be undertaken by the faculty with consideration given to factors such as: GPA (minimum 3.0), portfolio evaluation, and demonstrated research capability.
2. If progress or performance is deemed insufficient, the faculty may recommend probation with specific goals set for a specified time or termination.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The M.S. program in Textiles, Retailing and Consumer Sciences is available to residents of the state of Mississippi. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records. For the Ph.D., see Human Ecology.

Hotel and Restaurant Administration

GRADUATE COURSES

500 Thesis (1-15) P/NP only. E
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated: S/N/C only. E
530 Computer-Assisted Foodservice and Lodging Management (3) Application of computer technology to foodservice and lodging industry; inventory, cost accounting, production, nutrition analysis, rooms management, and sales planning and analysis. Prereq: Quantity Food Procurement, Production and Service, Microcomputer Applications or consent of instructor. F,A
531 Advanced Financial Management (3) Financial planning, operations and evaluation techniques used in foodservice and lodging management; developing budgets, accounting systems and financial reports. Prereq: Food and Lodging Cost Control or consent of instructor. F,A
532 Advanced Human Resource Management (3) Identifying labor needs; development and maintenance of work force. Prereq: Food and Lodging Personnel Development or consent of instructor. F,A
533 Advanced Food Production and Delivery Systems Management (3) Analysis of food production and delivery systems; application of quantitative methods and models to optimize decisions. Prereq: Quantity Food Procurement, Production and Service or consent of instructor. F
534 Special Topics in Foodservice and Lodging Administration (1-3) Lecture/discussion format. Contemporary developments and trends in industry. Prereq: Consent of instructor. May be repeated. E
536 Directed Study in Foodservice and Lodging Administration (1-3) Problems selected for study by student with guidance of faculty member. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E
510 Perspectives and Trends in Leisure Services (3) Basic role of leisure delivery systems in today's society, scope of leisure services, determinants of leisure behavior, developmental features of leisure and recreation. Current trends, problems, laws, and issues affected by and/or affecting delivery of leisure services. Sp

515 Philosophical and Conceptual Foundations of Leisure (3) Philosophical relationships between leisure, philosophy, concepts of leisure, recreation, play, work, and other factors, history of field, and relationship of ideas to contemporary society and to professional practice. F

520 Program Design and Evaluation in Therapeutic Recreation (3) History, philosophy, nature, purpose, special populations served, programming process, professional aspects of therapeutic recreation. Basic overview of aspects of leisure delivery systems. Prereq: Consent of instructor. F

521 Facilitation Techniques in Therapeutic Recreation (3) Role of therapeutic recreation in clinical and non-clinical settings: application of life-style planning, self-awareness, values clarification and assertiveness training in therapeutic recreation, relationship of leisure education to therapeutic recreation. Prereq: Consent of instructor. Su

530 Advanced Topics in Leisure Education (1-6) Research and management considerations, and research in the field of leisure education. May be repeated. S/NC only. Sp

531 Registration for Use of Facilities (3-15) Required of all students when they use University facilities. May be repeated. S/NC only. F

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. Sp

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 of recreation and sport related facilities. Prereq: Consent of instructor. Su

542 Advanced Hotel Administration (3) Strategic management of hotel organizations. Theoretical and applied analysis. International retailing. Current issues and present policies with economic, social, legal and environmental variables. Prereq: Consent of instructor. Su

545 Field Experience (3-9) Experience in food- or lodging-related industry or agency under supervision of faculty member. Prereq: Consent of instructor. S/NC only. E

561 The Consumer and Public Policy (3) Public policy and consumer behavior and choice within society; theory of consumer preferences and decision making; consumption patterns and models for individuals and households. International consumer economics, issues and policies. Prereq: Textile and Apparel Economics, Mathematics 503 or equivalent. F

567 Economics of Textile Complex (3) Economics concerning textile complex. Special emphasis on objective approaches to industry structure, production, marketing, distribution and institutions within both national and domestic settings. Current and future international issues and implications. Prereq: Calculus I or equivalent; Microeconomics. F


570 Research Seminar (1-3) Research topics in retail and consumer sciences. Prereq: 9 hrs retailing and consumer sciences graduate coursework. May be repeated. Maximum 9 hrs.

580 Graduate Research and Dissertation (3-15) Individual problems in retailing and consumer sciences related to current problems. Prereq: 533 or consent of instructor. F/A

581 Retail Data Analysis (3) How consumers make decisions and how retailers attempt to influence decisions by offering environment, image and selection options which appeal to consumers' needs.

585 Consumer Economics and Market Choices (3) Economic framework for understanding consumer behavior and choice within market system. Theory of consumer preferences and decision making; consumption patterns and models for individuals and households. International consumer economics, issues and policies. Prereq: Textile and Apparel Economics, Mathematics 503 or equivalent. F

590 Advanced 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 retailing, quality perception by consumers, product and service value, retailing to children, retailing and special populations, special research methods. Prereq: 9 hrs graduate coursework. May be repeated. Maximum 9 hrs.

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

631 Research Methods (3) Fundamentals of scientific method, advancement of science, methodology and method of research, issues and concepts of basic and applied research. Prereq: Statistics 531 or equivalent. Sp

632 Directed Study (1-3) Individual problems in retailing and consumer sciences. May be repeated. S/NC only. F

634 Retail Consumer Analysis (3) How consumers make decisions and how retailers attempt to influence decisions by offering environment, image and selection options which appeal to consumers' needs.

637 Retail Consumer Analysis (3) How consumers make decisions and how retailers attempt to influence decisions by offering environment, image and selection options which appeal to consumers' needs.

638 Consumer and Public Policy (3) Public policy and consumer behavior and choice within society; theory of consumer preferences and decision making; consumption patterns and models for individuals and households. International consumer economics, issues and policies. Prereq: Textile and Apparel Economics, Mathematics 503 or equivalent. F

639 Economics of Textile Complex (3) Economics concerning textile complex. Special emphasis on objective approaches to industry structure, production, marketing, distribution and institutions within both national and domestic settings. Current and future international issues and implications. Prereq: Calculus I or equivalent; Microeconomics. F

640 Retail Data Analysis (3) How consumers make decisions and how retailers attempt to influence decisions by offering environment, image and selection options which appeal to consumers' needs.

641 Retail Consumer Behavior (3) Theories and concepts from social science in relation to consumer behavior. Prereq: 6 hrs of sociology and/or psychology. F

645 Consumer and Public Policy (3) Public policy issues within consumer environments. Analysis of past and present policies within economic, social, legal and business frameworks. Implications of consumer issues and policy alternatives. Literature review. Prereq: 550 or consent of instructor.

647 Advanced Topics in Retail and Consumer Sciences (1-3) Lecture, group discussion, individual research on specialized topics: retail industry structure, international trade, international retailing, consumer affairs, entrepreneurship, small business management, issues in retail management, issues in retailing, 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.

650 Consumer Economics and Market Choices (3) Economic framework for understanding consumer behavior and choice within market system. Theory of consumer preferences and decision making; consumption patterns and models for individuals and households. International consumer economics, issues and policies. Prereq: Textile and Apparel Economics, Mathematics 503 or equivalent. F

652 Economics of Textile Complex (3) Economics concerning textile complex. Special emphasis on objective approaches to industry structure, production, marketing, distribution and institutions within both national and domestic settings. Current and future international issues and implications. Prereq: Calculus I or equivalent; Microeconomics. F

655 Student Internship (1-6) Required of all graduate students. Prereq: Consent of instructor. E

660 Doctoral Research and Dissertation (3-15) Individual problems in retailing and consumer sciences related to current problems. Prereq: 533 or consent of instructor. F/A

670 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 relationship between tourism and leisure and recreation. Current trends, problems, laws, and issues affected by and/or affecting delivery of leisure services. Sp

671 Professional Project (3-6) Application-oriented, capstone project to meet 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.

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

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

674 Hospitality Law (3) Legal research to determine legal principles at state and federal levels which impact industry. Prereq: Hospitality Law or equivalent, or consent of instructor. Sp, A

675 Foodservice and Lodging Law (3) Management organization and policy as interpreted or granted by law and legal research to determine legal principles at state and federal levels which impact industry. Prereq: Hospitality Law or equivalent, or consent of instructor. Sp, A

676 Retail and Consumer Sciences Literature and Research Seminar (1-3) Individual study and group discussion of topics related to current problems. May be repeated. S/NC only. Sp

677 Directed Study (1-3) Individual problems in retailing and consumer sciences. May be repeated. S/NC only. F, Sp

678 Consumer and Public Policy (3) Public policy issues within consumer environments. Analysis of past and present policies within economic, social, legal and business frameworks. Implications of consumer issues and policy alternatives. Literature review. Prereq: 550 or consent of instructor.
Textile Science

GRADUATE COURSES

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

501 Professional Project (3-6) Application-oriented, capstone project to show competency in major academic area. Enrollment limited to textile science students in non-theory program. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. S/NC only.

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

510 Fiber Science (3) Physical properties, mechanical properties and microstructure of polymeric fibers; relation to end-use properties. Prereq: Organic Chemistry and Thermal Physics or equivalent.


521 Nonwovens Science and Technology I (3) Non-woven fabric technology, different web forming processes; and relationships among the chemical, morphological and mechanical properties of fibers and orientation in webs to final performance properties of bonded structures. Prereq: Organic Chemistry or consent of instructor.

526 Nonwovens Science and Technology II (3) Interactions between mechanisms of production and mechanical properties of nonwoven fabrics; characterization of fiber morphology and structure; chemistry of nonwoven binder and finishes; and engineering of specific fabric properties. Prereq: 521 or equivalent.

528 Laboratory Methods in Nonwovens Processing and Characterization (3) Laboratory experience in nonwoven fabrication processes and characterization techniques. Effect of processing conditions on structure, development and properties of different types of webs. Prereq: 510 and 521.


590 Research Seminar (1) Research topics in textile science. May be repeated. S/NC only, F,SP

593 Directed Study (1-3) Individual problems in textile science. Prereq: 9 hrs graduate course as prerequisite. May be repeated. Maximum 9 hrs.

595 Advanced Topics in Textile Science (1-3) Lecture, group discussion, individual research on advanced topics and research areas of current significance. Future direction, professional issues, theoretical approaches. Prereq: Doctoral student and 9 hrs graduate coursework. May be repeated. Maximum 9 hrs.

625 Physical Chemistry of Fibers (3) Physical chemistry of fibers and fiber forming polymers; surface chemistry and thermal properties. Prereq: 510.


695 Advanced Topics in Textile Science (3) Lecture, group discussion, individual research on advanced topics and research areas of current significance. Future direction, professional issues, theoretical approaches. Prereq: Doctoral student and 9 hrs graduate coursework. May be repeated. Maximum 9 hrs.

Counselor Education and Counseling Psychology

(Card of Education)

MAJORS DEGREES

Counseling Counseling Psychology

M.A. Hector, Leader

Professors:

Davis, Kathleen E., Ed.D. .......... Georgia
DeRidder, Lawrence M. (Emeritus).
Ed.D.

Ph.D. .......... Michigan
Hector, Mark A., Ph.D., Michigan State
Huck, Schuyler W., Ph.D. .......... Northwestern
McClain, Ed W. (Emeritus), Ph.D.
Peterson, Marla P., Ph.D. .......... Ohio State
Pepen, William A., Ph.D. .......... Ohio State
Thompson, Charles L., Ph.D. ...... Ohio State

Associate Professor:

Hutchens, Teresa A., Ph.D. .......... Georgia

The Counselor Education and Counseling Psychology unit participates in graduate programs leading to degrees, majors, and concentrations in:

Master of Science

Counseling Community Counseling
School Counseling
Educational Specialist
Education
School Counseling
Doctor of Philosophy
Counseling psychology

See Education Under Field of Instruction for full description of all degree requirements.

The M.S. and Ed.S. degree programs with their respective concentrations are accredited by the Council for Accreditation of Counseling and Related Educational Programs. In addition, the counseling psychology concentration under the college-wide Ph.D. program is accredited by the American Psychological Association, and the specialization in counselor education within the counseling psychology concentration is accredited by the Council for Accreditation of Counseling and Related Educational Programs.

The Counselor Education and Counseling Psychology unit emphasizes research-based practices that address the growth and development of the whole person throughout the lifespan in its counseling programs, the unit concentrates on maximizing development and adjustment of individuals through prevention and treatment models in schools, colleges, community agencies, businesses, and private practice settings.

The application deadline for admission to the doctoral and Ed.S. programs is February 1; and November 1 and February 1 for the master's program.

ADMISSION REQUIREMENTS

Admission requirements include up-to-date scores from the GRE, the writing sample and letters of recommendation. For the doctoral programs, a writing sample is also required.

GRADUATE COURSES

410 Sex Role Development: Implications for Education and Counseling (3) Theories and research concerning the development of personality's sex role and its relevance in educational and counseling settings. F,SP

431 Personality and Mental Health (3) Various perspectives of mental health with application to education and other social institutions. E

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

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

503 Problems in Lieu of Thesis (2-3) May be repeated. Maximum 9 hrs. S/NC only, E

504 Special Topics (1-3) Instructor-initiated course offered at convenience of academic unit on topical interest. May be repeated. Maximum 15 hrs. S/NC or letter grade. F,SP

518 Educational Specialist Research and Thesis (3) May be repeated. P/NP only. E

520 Statistics and Research Design: Conceptual (3) Consumer-oriented, conceptual treatment of significance, research design, and qualitative analysis. E

525 Formal Measurement in Education and Counseling (3) Principles of test construction and item analysis. Survey of standardized tests of intelligence, achievement, aptitude, vocational interests, abilities, personality. Prereq: 520 or equivalent. F,SP

535 Ethical, Legal, and Professional Issues in Counseling (3) Professional 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) Theories, philosophy, professional standards, counselor role in relation to school staff and mental health professionals, and ethics of profession. F

551 Theory and Practice of Counseling (3) Philosophical bases of helping relationships; development of counselor and client self-awareness; counseling theory and techniques. F,SP

552 Career Development: Vocational Theory, Research and Practice (3) Relationship of vocational theory, career development research and societal factors to life career roles. F

553 Career and Educational Information Systems and Resources (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. E

555 Practicum in Counseling (3) Supervised practice and application of counseling skills with individual clients. Prereq: Admission to program, 431, 525, 551 and consent of instructor. May be repeated. Maximum 9 hrs. E

556 Seminar in Community Agency Counseling (1) Orientation to professional organizations, code of ethics, certification requirements, and role identity of community agency counselors. May be repeated. Maximum 2 hrs. S/NC only, F,SP

588 Internship in School Counseling (1-8) Supervised practicum employment at academic unit approved site. Prereq: 550 and consent of instructor. May be repeated. Maximum 12 hrs. S/NC only, E
**Cultural Studies in Education**

(College of Education)

<table>
<thead>
<tr>
<th>MAJORS</th>
<th>DEGREES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>M.S., Ph.D.</td>
</tr>
<tr>
<td>Human Performance and Sport Studies</td>
<td>M.S.</td>
</tr>
</tbody>
</table>

J.T. DeSensi, Leader

Professors:
- Allison, C. B., Ph.D. .......... Oklahoma
- DeSensi, J. T. (Liaison), Ed.D. ..... North Carolina (Greensboro)
- Howard, Robert (Emeritus), Ph.D. ....... Ohio State
- Malik, Anand, Ed.D. ............... Columbia
- Mead, B. J., Ph.D. ................. Purdue
- Morgan, W. J., Ph.D. ............... Minnesota
- Paul, Joan, Ed.D. ................. Wayne State
- Bisberg, C. A., Ph.D. ............... Michigan

Associate Professor:
- Fleming, Cynthia, Ph.D. ........... Duke

Assistant Professor:
- Wright, Handel K., Ph.D. .......... Toronto

<table>
<thead>
<tr>
<th>The Cultural Studies in Education unit participates in graduate programs leading to degrees, majors, and concentrations in:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master of Science in Education</td>
</tr>
<tr>
<td>Social foundations of Human Performance and Sport Studies</td>
</tr>
<tr>
<td>Sport studies</td>
</tr>
<tr>
<td>Doctor of Philosophy in Education</td>
</tr>
</tbody>
</table>

Cultural studies in education

See Education under Fields of Instruction for full description of all degree requirements.

The unit derives its intellectual identity and orientation from disciplines such as anthropology, history, philosophy, psychology, and sociology, and from more specialized forms of inquiry such as ethnography, semiotics, literary theory, hermeneutics, linguistics, and feminist theory.

As a unit founded upon and devoted to interdisciplinary inquiry, Cultural Studies in Education seeks to bring its disciplines to the service of students and faculty throughout the college as aids to understanding diverse cultural contexts that shape beliefs, values, and practices. The main charge of the unit is to examine critically the social practices, institutions, "helping" agencies, and other social sites where disenfranchised and marginalized groups struggle for greater control over their futures.

**GRADUATE COURSES**

| 500 Thesis (1-15) | P/NP only. E |
| 501 Special Project (3) | Culminating experience for nonthesis major. Research study suitable for publication, or practicum requiring special written work. Prereq: 532. |
| 502 Registration for Use of Facilities (3-15) | Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E |
| 505 History of Olympics: Ancient and Modern (3) | Examination of various aspects of ancient and modern Games. Ancient Olympics 777 B.C.-392 A.D. Panhellenic Games, Modern Olympics, 1896 to date: political, social, class, gender, and economic issues that influence Games. |
| 514 Advanced Philosophy of Sport (3) | Major philosophical theories of sport. Various conceptual, moral, aesthetic, and social-political issues. |
| 515 Social Theories of Sport (3) | Liberal, democratic, and Marxist social theories of sport (same as Sociology 594). |
| 526 Philosophy of Education (3) | Truth, knowledge, and value in relation to work of schools. F, Su |
| 533 Psychology of Sport (3) | Social psychological factors influencing human behavior in sport context; discussion of contemporary theory, research, and methodology. Prereq: General psychology course or consent of instructor. F, Su |
| 540 Motor Behavior and Skill Acquisition (3) | Topical exploration of the application of principles of human movement behavior to acquisition and performance of skills; discussion of current research and methodology. |
| 549 Development of Education Thought (3) | Historical and philosophical approaches to human and physical development; impact of influential educators: Plato, Quintilian, Comenius, Rousseau, Pestalozzi, Froebel, Dewey. Prereq: Graduate status and consent of instructor. F, Su |
| 540 Foundations of Educational Policy (3) | Relationship between theory, policy, and practice, educational policies that arise from philosophical and practical considerations relative to human nature, to educational purpose, to content of curriculum and to methods and techniques for conducting educational enterprise. F, Su |
| 541 Special Topics (1-3) | Advanced study in selected disciplinary or professional areas of physical education and/or sport. May be repeated. |
| 542 Sociological Aspects of Sport (3) | Social and cultural factors influencing sport and physical education. Relations between sport and society, and/or sport and society, for example, sports and health, sports and leisure, sports and recreation. Prereq: Consent of instructor. (Same as Sociology 542). |
| 545 Educational Sociology (3) | Sociological analysis of American education system. Controversial social issues that affect educational system and potential solutions for various programs. Open to juniors, seniors, and graduate students. F, Su |
695 Special Topics (1-3) Study for doctoral students in selected aspects of cultural studies. May be repeated. Maximum 9 hrs. S/NC or letter grade.

Ecology and Evolutionary Biology (College of Arts and Sciences)

MAJOR

A.C. Echternacht, Head
W.O. Smith, Associate Head

Professors:
Bunting, D. L., Ph.D. ............... Oklahoma State
Burghart, G. M., Ph.D. ............... Chicago
Delcourt, P. A., Ph.D. ............... Minnesota
Echternacht, A. C., Ph.D. ............. Kansas
Etebor, D. A., Ph.D. ............... Minnesota
Gavrilts, S., Ph.D. ............... Moscow State
Greenberg, N. B., Ph.D. ............... Rutgers
Gross, L. J., Ph.D. ............... Cornell
Hallam, T. G., Ph.D. ............... Missouri
Harris, W. F., Ph.D. ............... Tennessee
Kot, M., Ph.D. ............... Arizona
McCormick, J. F., Ph.D. ............... Emory
McCreaden, G. F., Ph.D. ............... Cornell
Pan, M. L., Ph.D. ............... Pennsylvania
Pimm, S. L., Ph.D. ............... New Mexico State
Riechert, S. E., Ph.D. ............... Wisconsin
Sayer, G. S., Ph.D. ............... Idaho
Schultz, T. W., Ph.D. ............... Tennessee
Simberloff, D. (Gore Hunger Chair of Excellence), Ph.D. ............... Harvard
Smith, W. O., Ph.D. ............... Duke
Stacey, G., Ph.D. ............... Texas
Vaughan, G. L. (Emeritus), Ph.D. ............... Duke

Associate Professors:
Amundsen, C. C., Ph.D. ............... Colorado
Bokde, C. R. B., Ph.D. ............... Cornell
Delcourt, H. Ph.D. ............... Minnesota
Drake, J. A., Ph.D. ............... Purdue
Fox, D. J., Ph.D. ............... Johns Hopkins
Gittlerman, J. L., Ph.D. ............... Sussex (UK)

Assistant Professors:
Cruzan, M. B. C., Ph.D. ............... SUNY (Stony Brook)
Pigliucci, M., Ph.D. ............... Connecticut

Research Assistant Professor:
Grebe, M., J., Ph.D. ............... Alaska

Shared faculty are drawn from other University departments, the Oak Ridge National Laboratory, the National Biological Service, and the Tennessee Valley Authority.

The Department of Ecology and Evolutionary Biology administers an interdisciplinary graduate program which offers the Master of Science and Doctor of Philosophy degrees with a major in Ecology and Evolutionary Biology and concentrations in behavior, ecology (including mathematical ecology) and evolutionary biology.

DEGREES

Ecology and Evolutionary Biology ... M.S., Ph.D.

REQUIREMENTS FOR ADMISSION

Applications are accepted once a year. The deadline for receipt of all application materials is 15 January for those applicants wishing to enroll in the following Fall or Spring semesters. Applications incomplete as of that date, or received after that date, will not be considered. Applicants are expected to have an academic background consistent with a Bachelor’s degree in the life sciences. They are expected to have completed a minimum of one year of general biology, two years of chemistry including one year of general chemistry, one year of physics, and one year of college-level calculus. Occasionally, applicants who are highly qualified otherwise but lack one of these courses or course sequences will be admitted with the expectation that the deficiency will be made up within the first year of graduate study. Applicants are required to submit scores from the general Graduate Record Examination (GRE) and successful applicants will usually have a composite score on the verbal, mathematical and analytical sections of the GRE of at least 1650. Submission of scores on appropriate (e.g., biology, mathematics) advanced GRE examinations are recommended but not required. Applicants are also expected to have an overall grade-point average of at least 3.0, and 2.7 or above for all science and mathematics courses, on a 4.0 scale (successful applicants will usually have grade-point averages well above these minimums).

Application must be made to both The Graduate School and the department. The departmental application requires 3 letters of reference from persons capable of assessing the applicant’s suitability for graduate work in biology and a statement of professional goals and reasons for applying to this program. Applicants for the doctoral degree are expected to have made prior contact with potential research advisors in the department’s graduate program and this approach is recommended for applicants for the Master’s degree program as well. Inquiries should be directed to the Chair, Graduate Affairs Committee, Department of Ecology and Evolutionary Biology, The University of Tennessee, Knoxville, TN 37996-1610.

THE MASTER’S PROGRAMS

In addition to general requirements of the Graduate School, aspirants for the Master of Science degree are expected to: (1) during the first semester in residence, take a prescriptive diagnostic examination covering major concepts in ecology and evolutionary biology. The examination may be taken twice and must be passed before the student is admitted to candidacy; (2) complete course requirements as determined by the department and the student’s faculty thesis research committee; (3) satisfactorily complete and defend a research thesis.

THE DOCTORAL PROGRAMS

In addition to general requirements of The Graduate School, aspirants for the Doctor of Philosophy degree are expected to: (1) during the first semester in residence, take a prescriptive diagnostic examination covering major concepts in ecology and evolutionary biology. The examination may be taken twice and must be passed before the student is admitted to candidacy; (2) complete course requirements as
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

403 Plant Evolution (3) (Same as Botany 403.)

411-412 Microcourse 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.

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 tropical regions. Field trip to coast required. Prereq: General Biology and General Chemistry. General Ecology recommended.

450 Comparative Animal Behavior (3) Principles and methods of ethology, ecological, developmental, physiological and evolutionary aspects. (Same as Psychology 450.)

459 Comparative Animal Behavior Laboratory (3) Introduction to observational and experimental research in ethology. Coreq: 450. (Same as Psychology 459.)


461 Special Topics in Organismal Biology (3) Evolution, ecology, biogeography, classification, and anatomy of selected animal and plant taxa. Prereq: General Ecology or consent of instructor.

470 Aquatic Ecology (3) Introduction to the physicochemical nature of inland waters with description of biotic communities and their interrelationships. Prereq: General Chemistry and General Ecology 2 hrs and 1 lab.


484 Conservation Biology (3) Application of principles and techniques of ecological research to conservation of biological diversity at genetic, population, community, and ecosystem levels. Prereq: General Genetics and General Ecology.

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

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

503 Ecology and Evolutionary Biology Seminar (1) Advanced topics in ecology, behavior, and evolutionary biology. Open to departmental majors encouraged. Required of all first- and second-year graduate students. May be repeated. Maximum 4 hrs. S/NC only.

504 Special Topics (1-3) Selected directed readings or special course in topics of current interest. Consult departmental listing for offerings. May be repeated with consent of instructor. Maximum 9 hrs. S/NC only.

505 Basic Concepts in Organic Evolution (3) Processes and patterns in organic evolution. Prereq: Admission to program in Evolution and Evolutionary Biology. Required of all first-year students. F.


508 Introduction to Faculty Research (1) Orientation of new graduate students to current research of departmental graduate faculty. Prereq: Admission to program in Evolution and Evolutionary Biology. Required of all first-year students. S/NC only.

509 Foundations: Readings in Ecology (1-2) Readings and discussion of classic papers in field.

511 Foundations: Readings in Evolution (1-2) Readings and discussion of classic papers in field.

513 Foundations: Readings in Behavior (1-2) Readings and discussion of classic papers in field.

515 Foundations: Readings in Environmental Toxicology (1-2) Readings and discussion of classic papers in field.

516 Colloquium in Ethology (1) (Same as Psychology 516.)

520 Ecology for Planners and Engineers (3) Ecological principles and effects that human-caused changes have on living organisms. Lectures and field trips. Appropriate for students in Planning and Environmental Engineering. Not intended for graduate students in Ecology and Evolutionary Biology.


535 Ecology and Development in the Amazon (3) Natural history, ecosystem diversity and function, and 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 insect morphology 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 invertebrates exclusive of insects. Prereq: Comparative Invertebrate Ecology or equivalent and consent of instructor. 3 hrs lab and field study.

545Advanced Animal Behavior (3) Second-level course in ethology, stressing evolution, genetics, physiology, ecology and human behavior. Prereq: 540 or equivalent. (Same as Psychology 545.)

547 Conceptual Foundations of Evolution and Behavior (3) (Same as Psychology 547.)

552 Development Planning in the Third World (3) (Same as Planning 552.)

555 Environmental Planning (3) (Same as Planning 555.)

556 Ice-Age Environments and Global Climate Change (3) Global-interglacial climatic cycles and dynamic responses of landscapes within glacial, periglacial, and non-glacial environments across North America over past 2.5 million years. (Same as Geological Sciences 556.)

560 Biometry (3) Statistical applications in biological research. Prereq: Statistics course or consent of instructor.

561 Environmental Toxicology (3) Basic concepts in toxicology, molecular toxicology and detoxification; reproductive toxicology; mutagenesis, teratogenesis, carcinogenesis, pathologic changes and environmental impact. Prereq: Chemistry and General Biology 410, Organic Chemistry or consent of instructor. (Same as Biochemistry and Cellular and Molecular Biology 561.) F.

575 Ecological Genetics (3) Genetics of natural populations, using both single-locus and quantitative genetic approaches. Prereq: 573 and statistics course.

577 Landscape Ecology (3) Ecological structure, function, and change through time of landscape mosaics: quantitative measures of landscape heterogeneity; responses of organisms to landscape configuratively. Prereq: General Ecology or equivalent or consent of instructor.

581-582 Mathematical Ecology (3,3) (Same as Mathematics 581-582.)

583 Zoogeography (3) Processes determining geographic distribution of animals and distribution and composition of animal communities. Prereq: Ecology course 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.

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

601 Advanced Topics (1-3) Readings and discussion of recent advances. Consult the departmental listing for offerings. May be repeated with consent of department. Maximum 9 hrs.

604 Current Topics in Environmental Toxicology (1) Critical reviews of research problems and methods in environmental toxicology, behavioral toxicology, biochemical and ecological effects, biostatistics and epidemiology. Presented by student and guest lecturers from academia and industry. May be repeated with consent of department. Maximum 4 hrs. (Same as Biochemistry and Cellular and Molecular Biology 604.) S/NC only. F, Sp.

607 Seminar in Ecology and Evolutionary Biology (1) Readings and discussion based on recent literature. May be repeated. Maximum 12 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 equivalent. (Same as Botany 635 and Planning 635.)

681-682 Advanced Mathematical Ecology (3,3) (Same as Mathematics 681-682.)

ECONOMICS

(College of Business Administration)

MAJORS

DEGREES

Economics........................................M.A., Ph.D.

Business Administration..........................M.B.A.

Matthew N. Murray, Head
THE MASTER'S PROGRAM

Graduate students in good academic standing have the right to petition for admission to the M.A. program. The M.A. program may be completed by either a thesis or non-thesis option. The non-thesis option requires 30 hours of coursework at the 400 level or above. At least 10 courses (at least 18 hours of which are in economics) must be at the 500 level or above. Of the minimum of 18 hours in economics at the 500 level or above, 12 hours must consist of 511, 512, and 513, and 6 hours must be in one field of economics. Of the 30 hours, a maximum of 9 hours in courses approved by the department may be taken in fields other than economics. Students electing the non-thesis option are required to pass a final comprehensive examination.

The thesis option requires 30 hours of coursework at the 400 level or above, including at least 24 hours at the 500 level or above, 6 hours of which may be thesis hours. Of the remaining 18 hours at the 500 level or above, at least 15 hours must be in economics and must include 511, 512, 513, and 514. A maximum of 6 hours may be in an area other than economics.

STUDENT'S RIGHT TO PETITION

Graduate students in good academic standing have the right to petition the department for modification of departmental degree requirements and redress of grievances. Petitions must be in writing and addressed to the Director of Graduate Studies.

THE MASTER'S PROGRAM

Admission to the M.A. program is based on undergraduate academic performance and on scores from the general portion of the GRE. The student may choose either the thesis or the non-thesis option.

The non-thesis option requires 30 hours of coursework at the 400 level or above. At least 10 courses (at least 18 hours of which are in economics) must be at the 500 level or above. Of the minimum of 18 hours in economics at the 500 level or above, 12 hours must consist of 511, 512, and 513, and 6 hours must be in one field of economics. Of the 30 hours, a maximum of 9 hours in courses approved by the department may be taken in fields other than economics. Students electing the non-thesis option are required to pass a final comprehensive examination.

The thesis option requires 30 hours of coursework at the 400 level or above, including at least 24 hours at the 500 level or above, 6 hours of which may be thesis hours. Of the remaining 18 hours at the 500 level or above, at least 15 hours must be in economics and must include 511, 512, 513, and 514. A maximum of 6 hours may be in an area other than economics.

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 will be required to register for at least three hours of Economics 579, Environmental Policy Research Workshop, and to complete successfully the following:

1. Ecology and Evolutionary Biology 520 or Plant and Soil Sciences 414 or Geography 433 or an equivalent course approved by the coordinating committee.
2. Six hours of coursework outside the major discipline approved by the coordinating committee.

Doctoral students seeking a minor in environmental policy must also complete in addition to above, a policy-relevant dissertation approved by the coordinating committee.

BUSINESS ADMINISTRATION CONCENTRATION

For complete listing of MBA program requirements, see Business Administration. MBA Concentration: Economics.

Minimum course requirements are as approved by the area MBA faculty advisor.

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 macroeconomic fluctuations, theoretical explanations of cycles, and role of monetary and fiscal policies in aggregate economy. Major writing requirement. Prereq: Intermediate Macroeconomics or consent of instructor.

415 History of Economics (3) (Same as History 415.)

424 Political Economy of World Development (3) Topics vary: Latin America, Asia, Soviet Union and Eastern Europe. Analysis of major economic strategies, policies, and problems. Prereq: 201. This course includes a major writing requirement. May be repeated when topic varies. Maximum 9 hrs.


462 Economics of Resources and Environmental Policy (3) Economic analysis of environmental policy and allocation of resources. Benefits and costs of development of natural resources and impacts of growth on environment. Major writing requirement. Prereq: 201.

471 Public Finance: Optimal Government Functions and Expenditure Analysis (3) Problems of collective
consumption, external effects, public investment, social decision making. Major writing requirement. Prereq: 201.

472 Public Finance: Taxation and Intergovernmental Relations (3) Analysis of individual taxes and of tax systems, non-tax sources of revenue, fiscal federalism. Major writing requirement. Prereq: 201.

482 Introduction to Mathematical Economics (3) Application of basic mathematical tools: calculus, matrix algebra, etc. to major topics of economic theory. Prereq: Intermediate Microeconomics with B or better and Calculus.

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

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

511-12 Microeconomic Theory (3,3) Theory of consumer choice and demand, theory of revealed preference, attributes of goods and implicit prices, market demand, labor supply, individual behavior under uncertainty, theory of firm, theory of production and cost, market structures, derived demand and factor pricing, introduction to welfare economics, market failure and theory of second best, pure exchange.

513-14 Macroeconomic Theory (3,3) Determination of national income levels, prices, and employment. Results using Keynesian, non-market-clearing, monetarist, and neoclassical economic-policy analysis; From Adam Smith through J.S. Mill and K. Marx. Antecedents of neoclassicism: J. Dupuit and H.H. Gossen.

525 Economic History of Europe (3) Nature and functioning of economic systems and policies in history of Western civilization, major issues of method and interpretation. Prereq: Graduate standing in economics or consent of instructor.

526 Economic History of the U.S. (3) Interpretation of American economic growth and development policies from colonial times. Prereq: Graduate standing in economics or consent of instructor.

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 areas of governmental-business relations.

577 Environmental Economics and Policy Management (3) Interdisciplinary perspective on goals of sustainable environment and environmental quality. Development of decision-making tools and conflict resolution.

579 Environmental Policy Research Workshop (1) Multidisciplinary analysis of advanced topics in environmental policy. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

581 Mathematical Methods In Economics (3) Mathematical analysis in economic theory. Applications of selected mathematical techniques to economic topics: theories of choice, firm, consumer behavior, general equilibrium, games, distribution, growth, stability, and input-output. Prereq: 311 and calculus.


583 Econometric Techniques (3) Multivariate time series, panel data and limited dependent variable analysis applied to economic problems. Prereq: 562.

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

613 Advanced Macroeconomic Theory (3) Prereq: 514 or equivalent.


621 International Economics (3) Comparative advantages, trade liberalization, monetary composition of trade, trade structures, trade liberalization, and international trade. U.S. trade policy, exchange rate determination, balance of payments adjustment, multilateral corporatization, and international capital flows. Prereq: 512 and 514.

623 Economic Development: Theories and Policies (3) Principal theories explaining economic behavior in developing countries and policies and strategies used to promote development. Prereq: Undergraduate degree in economics or consent of instructor.

624 Economic Development: Western Impact on Asia and Africa (3) Studies of consequences of contact between developed world and developing countries of Asia and Africa. Prereq: 21 hrs of upper division undergraduate social science or consent of instructor.


642 Labor History and Legislation (3) Development of organized labor as major economic and political force in U.S., from Colonial times to present. Evolution of legal status of labor unions and of individual workers vis-a-vis their employers.

651 Monetary Theory (3) Study of money, credit, and liquidity as related to output determination, interest rates, employment, and prices. Prereq: 513.

652 Topics in Monetary Theory (3) Advanced monetary models, issues in monetary policy, open economy monetary theory and policy. Student participation. Prereq: 651.

651 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 and urban economic structure and growth. Regional income and product accounts, growth and sharing analysis, economic base studies, and regional-urban input-output models. Theory and problem solution.


672 Public Finance: Taxation and Intergovernmental Relations (3) Theory of taxation; tax incidence and tax efficiency; policy analysis of U.S. tax system at federal, state, and local levels. Theory of fiscal federalism and intergovernmental relations.

677 Environmental and Natural Resource Economics (3) Alternative paradigms for allocating and valuing environmental resources. Exploration of issues related to market failure and differences between renewable and nonrenewable resources.

678 Economics of Environmental Policy (3) Topics in environmental policy analysis. Consideration of alternative policy instruments, defining policy objectives and role of risk in decision-making process.

682 Econometric Methods (3) Advanced topics in econometrics. Prereq: 583 or equivalent.

690 Workshop (3) Advanced topics in economics. Student participation. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

The College of Education offers the Master of Science, Educational Specialist, Doctor of Education, and Doctor of Philosophy degrees in cooperation with eleven individual units: Counseling Education and Counseling Psychology (CECP); Cultural Studies in Education (CSE); Education in the Sciences, Mathematics, Research and Technology (ESMRT); Exercise Science (ES); Holistic Teaching/Learning (HTL); Inclusive Early Childhood Education (IECE); Language, Communication, and Humanities Education (LCH); Leadership Studies in Education (LSE); Psychosocial Education Studies (PES); Rehabilitation, Deafness, and Human Services (RDHS); Sport and Physical Activity (SPA).

The College also offers initial teacher licensure programs at the undergraduate and graduate levels. The program features a professional year internship with accompanying coursework which may lead to a master's degree with a major in Education. To continue the master's degree, a student must complete at least 12 credits in higher education courses.

Counseling
The master's degree with a major in Counseling offers concentrations in Counseling (CECP), Rehabilitation Counseling (RDHS) and School Counseling (CECP). The program includes (with abbreviated unit designations): Counseling Education (CECP), Rehabilitation Counseling (RDHS) and School Counseling (CECP). The program includes thesis and non-thesis options. The concentration in community counseling is fully accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP) and requires completion of 60 hours of coursework plus supervised practicum and internship experiences working with clients. The concentration in rehabilitation counseling is fully accredited by the Council on Rehabilitation Education, Inc., and requires 54 semester hours, including internship. A minimum of 12 hours of Rehabilitation, Deafness and Human Services courses is required. The concentration in school counseling is fully accredited by the Council for Comprehensive school counseling (CECP).
Accreditation of Counseling and Related Educational Programs and requires 48 hours of coursework, including supervised practicum and internship experiences working with clients. A final examination is required of all students.

Education

The master’s degree with a major in Education has two tracks. Track 1 is intended for students who are licensed to teach English, foreign language, mathematics, natural science, social science, early childhood special education, modified and comprehensive special education, or education of the deaf and hard of hearing. (Non-licensed applicants to Track 1 will be reviewed on a case-by-case basis and must have a strong disciplinary background and professional goals which can be fostered through participation in this non-licensure program.) Track 2 is designed for students seeking initial teacher licensure in one of the above fields. Thesis and non-thesis options are available for both tracks.

Track 1 - Concentrations (with abbreviated unit designations) are available in:

- Art education (LCHE)
- Curriculum, assessment, and instruction (ESMRT)
- Education of the deaf and hard of hearing (RDHS)
- Elementary education (HTL and IECCE)
- English education (LCHE)
- Foreign language/ESL education (LCHE)
- Instructional technology (ESMRT)
- Mathematics education (ESMRT)
- Modified and comprehensive special education (HTL)
- Reading education (HTL)
- Science education (ESMRT)
- Social foundations (CSE)
- Social science education (HTL)
- Special education: early childhood (IIECE)

The thesis option requires the completion of 30 hours, including 6 hours of Thesis 500. The non-thesis option requires the completion of 33 hours of coursework (36 hours for special education concentrations). Both options require a minimum of 12 hours in the major discipline (18 hours for special education concentrations).

Track 2 - Concentrations (with abbreviated unit designations) are available in:

- Art education (LCHE)
- Education for the deaf and hard of hearing (RDHS)
- Elementary teaching (HTL and IECCE)
- Modified and comprehensive special education (HTL)
- Secondary teaching (ESMRT, HTL, and LCHE)
- Special education: early childhood (IIECE)

The thesis option requires completion of 36 hours, plus 6 hours of Thesis 500 for a total of 42 hours. The non-thesis option requires 36 hours, including 24 hours of prescribed licensure coursework and 12 hours in the academic discipline as approved by the student’s committee.

For both tracks, a comprehensive written examination is required. An oral exam is given over the thesis.

Educational Psychology

The master’s degree with a major in Educational Psychology is offered with concentrations (with abbreviated unit designations) in:

- Adult education (PES)
- Individual & collaborative learning (PES)
- Both programs include thesis and non-thesis options.
- The major in Educational Psychology requires 36 hours. The concentration in adult education requires a minimum of 12 hours in adult education courses. A final examination is required of all master’s degree students.

Human Performance and Sport Studies

The master’s degree with a major in Human Performance and Sport Studies offers concentrations (with abbreviated unit designations) in:

- Exercise science (ES)
- Sport studies (CSE)
- Sport management (SPA)

Applicants must submit a unit admission application and 3 letters of recommendation. Both thesis and non-thesis options are available. The non-thesis option requires 32 hours, including a project, and a course in research design or an approved specialized research class. The thesis option requires the completion of 33 hours, including 6 hours of Thesis 500. Both options require a minimum of 12 hours of sport studies, exercise science, or sport management courses.

Leadership Studies in Education

The master’s degree program with a major in Leadership Studies in Education offers a concentration in educational administration and supervision (LSE), requiring a minimum of 30 hours, including 6 hours of Thesis 500, for the thesis option, or 33 hours for the non-thesis option.

The concentration in educational administration and supervision consists of a minimum of 18 hours of coursework in Educational Administration and Supervision. A final oral examination is required for the thesis option, with a written exam at the option of the committee. A final written comprehensive examination is required for the non-thesis option, with an oral exam at the option of the committee. Students entering either of these options must complete the introductory core consisting of Educational Administration and Supervision 513, 515, 516, and 535 or a demonstrated computer proficiency. These courses are prerequisites to other courses in the unit.

THE SPECIALIST IN EDUCATION PROGRAM

The Educational Specialist degree program with a major in Education encompasses concentrations (with abbreviated unit designations) in:

- Curriculum, assessment, and instruction (ESMRT)
- Educational administration & supervision (LSE)
- Elementary education (HTL)
- English education (LCHE)
- Foreign language/ESL education (LCHE)
- Instructional technology (ESMRT)
- Mathematics education (ESMRT)
- Reading education (HTL)
- School counseling (CECP)
- School psychology (PES)
- Science education (ESMRT)
- Social science education (HTL)

The instructional and curricular concentrations require completion of a minimum of 30 hours of coursework beyond the master’s degree, including 6 hours in core courses, 18 hours in specialized courses, and 6 hours to be determined by the student’s committee. The educational administration and supervision concentration requires the completion of a minimum of 60 hours beyond the baccalaureate, including a 6-hour cognate within or external to the college, and a highly recommended internship. Both thesis and non-thesis options are available. The school counseling concentration requires a minimum of 22 hours beyond the master’s degree but not fewer than 60 hours beyond the baccalaureate, including practicum and internship experiences. The school psychology concentration requires the completion of a minimum of 24 semester hours beyond the baccalaureate. Refer to Degree Requirements under The Graduate School for complete program requirements.

THE DOCTOR OF EDUCATION PROGRAM

The Ed.D. program with a major in Education is available in the following concentrations (with abbreviated unit designations): Curriculum, assessment, and instruction (ESMRT)

- Educational psychology: collaborative learning (PES)
- Elementary education (HTL)
- English/foreign language/ESL education (LCHE)
- Instructional technology (ESMRT)
- Leadership for teaching and learning
- Leadership studies (educational administration & supervision; higher education) (LSE)
- Mathematics education (ESMRT)
- Reading education (HTL)
- Science education (ESMRT)
- Social science education (HTL)

In addition to the requirements of The Graduate School, the hour requirements in the curricular and instructional concentration areas are determined by the student’s doctoral committee. A comprehensive examination and an oral examination on the dissertation are also required.

The concentration in adult education requires the completion of a minimum of 60 hours beyond the baccalaureate degree. Coursework is required in statistics and research design. Comprehensive examination in the concentration, supporting specialization, and cognate area(s), as well as an oral examination on the dissertation, are also required.

The concentration in educational psychology: collaborative learning requires the completion of a minimum of 90 hours beyond the baccalaureate degree. Coursework is required in research and design. Comprehensive examination in the concentration, supporting specialization, and cognate area(s), as well as an oral examination on the dissertation, are also required.

The concentration in educational psychology: collaborative learning requires the completion of a minimum of 60 hours beyond the baccalaureate degree and incorporates a cohort model through which students participate in core courses as a group. This program offers an alternative residency which includes a two-year, on-campus, full-time commitment to include summers. During this time period, students are enrolled in a doctoral seminar (EDS) for one of the six semesters and participate with faculty on research teams for 12 of the required hours. Contact the program coordinator for additional information and program requirements.

The requirements for the concentrations in educational administration and supervision and higher education are determined on an individual basis by each student’s doctoral committee. Course requirements include a 6-9 hour cognate within the college and a 6-9 hour minimum external to the college. Additional course requirements include completion of two consecutive semesters of Educational Adminis-
tion and Supervision 604 during residence. Though an internship is highly recommended, it is not required. A foreign language requirement is at the discretion of the committee. A written comprehensive examination, as well as an oral examination on the dissertation, is required. An alternative residency, which includes a two-year, on-campus, continuous enrollment in LSE 606, Leadership Forum, is available for qualified students.

THE DOCTOR OF PHILOSOPHY PROGRAM

The intercollegiate Ph.D. program with a major in Education provides seventeen concentrations. The units participating in the Ph.D. program are Counselor Education and Counseling Psychology; Cultural Studies in Education; Education in the Sciences, Mathematics, Research, and Technology; Exercise Science; Holistic Teaching/Learning; Inclusive Early Childhood Education; Language, Communication, and Humanities Education; Leadership Studies in Education; Psychological Studies; and Rehabilitation; Deafness, and Human Services.

The program requirements are:

Requirements Minimum Hours
Research Area 15
Foreign or Computer Language (demonstrate proficiency) 6

General Core Requirements

Option A
-History and philosophy of education, (both areas must be represented) 4
-Learning theory and curriculum (both areas must be represented) 4
-Administrative/Leadership theory 2
-Trans-college seminar: two consecutive semesters 2

Option B
-Philosophy of education 3
-History of education 3
-Administrative theory 3
-Learning theory 3
-Curriculum theory 3
-Trans-college seminar: two consecutive semesters 2

Option C
-Philosophy of science 3
-Trans-college seminar: two consecutive semesters 2

Seminar(s) in primary concentration 3
-Learning theory/group dynamics or independent study in this area 3

Concentrations
-Primary Concentration: A minimum of hours normally selected from one or two specializations within the primary concentration 15
-Supporting Concentration: A minimum of 9 hours selected from concentrations other than the primary concentration 9

Cognate
-A minimum of 6 hours selected from outside the college in addition to the designated research courses 6

Dissertation 24

The concentrations are:

Early childhood special education
Elementary education
English, foreign language, ESL education
Exercise science
Instructional technology/curriculum
Leadership studies (educational administration and supervision; higher education)
Literacy studies (reading/language arts)
Mathematics, science, and social science education
Rehabilitation and special education
Research/assessment/evaluation
School psychology

Residence is three consecutive semesters of full-time coursework; the program requires coursework in both a supporting concentration and a cognate area, as well as either foreign language or computer proficiency. Coursework in statistics and research design is required in all specializations. Pre-dissertation research participation is also a requirement.

For the Ph.D. with a major in Education under Counselor Education and Counseling Psychology and under Psychoeducational Studies units, two applications are required: one for the Ph.D. in Education program and one for the unit that specifies which specialization is desired, in addition to the application for admission to The Graduate School.

Under Counselor Education and Counseling Psychology, the following minimum number of hours is required, according to which field the student follows: counseling psychology, 96; counselor education, 98. The concentration in counseling psychology requires a year-long practicum sequence and the equivalent of a year's full-time work as an intern in an appropriate counseling setting.

Under Psychoeducational Studies, the following minimum number of hours is required in each program: educational psychology, 92; school psychology, 97. The concentration in educational psychology also requires a supervised practicum experience in classroom teaching.

The guidelines for each program may be consulted for further requirements.

TEACHER LICENSURE

In addition to the above cited degree programs, the College of Education offers graduate level teacher licensure courses. Students completing requirements for initial teacher licensure earn 24 semester hours of graduate credit which may be applied to a 36 semester hour Track 2 master's degree with a major in Education.

To earn initial teacher licensure, students must complete undergraduate prerequisite courses, gain admission to The Graduate School as a degree seeking student, and the following 24 hours of coursework:

Full Semester

575 Internship 4 hrs
574 Analysis of Teaching for Professional Development 2 hrs

Spring Semester

575 Internship 8 hrs
591 Clinical Studies 4 hrs
TOTAL 24 hrs

Further details concerning the teacher licensure program and the Track 2 master's degree program are available through the College of Education Graduate Center (Claxton Addition, Room 211).

MINOR IN GERONTOLOGY

Graduate students in the units of Counselor Education and Counseling Psychology, Exercise Science, or Psychoeducational Studies may pursue a specialized minor in gerontology. This interdisciplinary minor gives the student an opportunity for combining the knowledge about aging in American society with his/her major concentration. Please refer to Human Ecology for specific requirements.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The M.S. program in Counseling is available to residents of Alabama; concentration in rehabilitation counseling only. The M.S. program in Education is available to residents of the states of Kentucky (concentration in education of the deaf and hard of hearing or early childhood special education), Louisiana (concentration in foreign language/ESL education-Track 1 only), or Maryland, South Carolina, Virginia, or West Virginia (concentration in education of the deaf and hard of hearing). The M.S. program in Performance and Sport Studies is available to residents of Arkansas; and Alabama, South Carolina, or Virginia (concentration in sport management only). The Ph.D. program in Education is available to residents of the state of Arkansas concentration in counseling psychology, educational administration and supervision/higher education, educational psychology, or school psychology). Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

510 Advanced Educational and Clinical Procedures (3-6) Integration of advanced educational and clinical procedures; skills and knowledge for implementing instruction and for consulting with other persons in treatment of exceptional individuals. May be repeated. Maximum 6 hrs.

517 Seminar (1-3) Curricular, instructional technology, elementary education, secondary education, or special education as related to goals of students' programs. May be repeated. Maximum 6 hrs. S/N only. E

532 Instructional Research: Analysis and Application (3) Analysis of research on instruction. Translation and application of research findings into instructional performance. Prereq: Consent of instructor. F, Su

540 Topics in Improvement of Instruction (1-3) Special conferences, workshops, and inservice programs. May be repeated. Maximum 6 hrs. S/N only. E

562 Direction and Supervision of Student Teaching (3) Roles and responsibilities of cooperating teachers and student teacher; objectives and policies of student teaching program; elements of clinical supervision; overview of research. F, Su

568 Teacher-Parent-Community Relations (3) Techniques for effective relations between parents and teachers: expectation of roles and responsibilities; parent involvement; volunteer programs; influence of community on educational process. Prereq: Consent of instructor. Sp, Su

574 Analysis of Teaching for Professional Development (3) Strategies to document and analyze effectiveness of teaching and of professional development. Study and application of various approaches. Coreq: 575. F

575 Professional Internship in Teaching (1-8) Intensive teaching and teaching-related experiences in professional settings in public schools. Enrollment limited to

94 Education
Education in the Sciences, Mathematics, Research, and Technology

(College of Education)

MAJOR

DEGREES

Education

M.S., Ed.S., Ed.D., Ph.D.

M. Everett Myer, Leader

Professors:

Dessart, Donald J., Ph.D. ........ Maryland
Frandsen, Henny, Ph.D. ........ Illinois
French, Russell, Ph.D. ........ Ohio State
Hipple, Theodore W., Ph.D. ....... Illinois
McIntyre, Lonnie D., Ed.D. ........ Indiana
Myer, M. E. (Liison), Ph.D. ......... Florida
Ray, John R., Ed.D. ........ Tennessee
Roeske, C. E., Ph.D. ........ Ohio State

Associate Professor:

Connelly, Mary Jane, Ed.D. .......... VPI
Grant, A. D., Ph.D. ........ Wisconsin
Melear, C. T., Ph.D. ........ Ohio

Assistant Professor:

Robinson, Stephanie O., Ph.D. ........ Florida

The Education in the Sciences, Mathematics, Research, and Technology unit participates in graduate programs leading to degrees, majors, and concentrations in:

Master of Science

Education

Track 1: curriculum, assessment, and instruction

Track 1: instructional technology

Track 1: science education

Track 2: secondary teaching

Educational Specialist

Education

Curriculum, assessment, and instruction

Instructional technology

Mathematics education

Science education

Doctor of Education

Education

Curriculum, assessment, and instruction

Instructional technology

Mathematics education

Science education

Doctor of Philosophy

Education

Instructional technology/curriculum mathematics/science/social science education

Research/assessment/evaluation

See Education under Fields of Instruction for full description of all degree requirements.

The unit is composed of four areas: science and mathematics education, educational research and statistics, instructional media and technology, and curriculum studies. The mission of all areas focuses on the preparation of teachers and instructors in curriculum and integrative mathematics and sciences and in the preparation of various other professionals who desire to utilize educational research and instructional technology.

GRADUATE COURSES

475 Utilization of Instructional Media (3) Basic concepts of communication and instructional development for improving instruction through the use of media. (Same as Information Sciences 475.) E

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 Program. F

496 Teaching Science Grades 7-12 (3) Methods, materials, recent trends in science and environmental education programs for secondary schools. Prereq: Admission to teacher education. F

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

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


518 Educational Specialist Research and Thesis (3) May be repeated. P/NP only. E

520 Techniques of Research in Education (3) Study and application. F

521 Computer Applications in Classroom (3) Computer applications and peripherals in school and classroom. Appropriate for all grades and subjects as well as non-school instructional situations. Prereq: Microcomputer and Instructional Design, Applications of Instructional Technology in Elementary and Middle School Teaching, or Introduction to Instructional Computing. E

522 Programs and Materials in Elementary School Mathematics (3) Examination, development and use of materials for creating an active learning environment for learning mathematics in elementary and middle schools. Prereq: 530, 543, or equivalent. E

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.

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.

535 Program Evaluation in Education (3) Issues and practices in planning and conducting program and curriculum evaluation in a variety of settings. Fundamentals of design, measurement, philosophy, ethics, and underlying values; proper role and use of evaluation in educational organizations. Prereq: Consent of instructor. (Same as Higher Education 534.)


543 Teaching Mathematics in Middle Schools: 5-8 (3) Unit planning, daily planning, grouping and other strategies of teaching mathematics for those with little preparation in teaching middle school mathematics.

557 The Junior High and Middle School Curriculum (3) Curriculum and instructional design for junior high and middle school. Characteristics of students, curriculum design, instructional patterns, and organization and structure of junior high and middle school.

558 Curriculum Planning and Development (3) Foundations and principles of curriculum planning and development. Historical analysis of curriculum theory, principles of planning and development, and classroom applications for improved learning.

560 Student Assessment (3) Processes for assessing and reporting student progress; interpretation and use of available assessment data. Methods of assessment other than tests and measurements: portfolios, performance tasks, exhibitions.

561 Educational Statistics (3) Applications of descriptive and inferential statistics to educational and instructional problems. Use of electronic calculators in educational research. Prereq: One-year course in college mathematics, an elementary course in statistics, 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 new theory to teaching biological, physical, and environmental sciences. Prereq: 496, Holistic Teaching/Learning 442, or equivalent.

566 Administering Instructional Media Programs (3) Leadership roles and responsibilities of professional media administrator in variety of organizational settings.

569 Advanced Production of Audiovisual Software (3) Hand and mechanical lettering, flat picture mounting, laminating, overhead projection, audio production, TV studio orientation, sync-teleprompting, multi-screen presentations, and editing techniques. (Same as Information Sciences 569.)

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.

573 Instructional Design and Interactive Multimedia (3) Basic instructional design and development of interactive multimedia programs. Use of appropriate authoring programs for writing instructional programs. Prereq: Computer programming experience.

577 Introduction to Data Processing in Curriculum and Instruction (3) Analysis of current activities in educational computing and data processing. Curriculum, instructional research, and classroom management applications from microcomputers to super computers. Prereq: Consent of instructor.
The Electrical Engineering Department has a graduate committee to administer, promote and advance the general well-being of the graduate program.

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

Students applying for admission to the Master of Science program and who hold a B.S. in Electrical Engineering are considered for admission on an individual basis. The minimum expectation is an undergraduate cumulative grade-point average of 3.0 out of 4.0 and a GPA of 3.0 for 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 B.S. or B.A. 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. These students should also have a background equivalent to that obtained by earning credit with a minimum 3.0 grade-point average in the Electrical Engineering courses normally taken at the 200 and 300 levels in the Bachelor's program in this department, and two senior Electrical Engineering courses (and any labs associated with them) in the student's area of interest. Students from fields other than electrical engineering who have met the admission standards except for this background will be admitted only as non-degree students until they have completed coursework to provide this background.

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.

The 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.
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 enrolls in the program. A student who fails the qualifying examination must take and pass the examination the next time it is offered to remain in the program. A minimum of 18 hours of coursework must be completed after the student has taken the qualifying examination the first time.

A comprehensive examination is required by The Graduate School. In this department the comprehensive exam is administered by the student's committee; the exam results are reported to the graduate committee for approval; and the exam files 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 creatively, skill in using academic resources, and ability to complete the dissertation satisfactorily. The oral part consists primarily of a professional presentation of a proposal for dissertation work and its defense. The committee may cover additional topics in the oral part.

5. Participation in departmental seminars.


Some of the electrical engineering courses are offered in the evening. Engineers working in industry are encouraged to participate in the department's graduate program. Departmental graduate programs are also available at the Space Institute, Tullahoma.

Department actions regarding a graduate student may be appealed in writing, first to the departmental graduate committee and then to the department faculty.

GRADUATE COURSES

Note: Courses required in the Electrical Engineering undergraduate curriculum cannot be used toward the M.S. or Ph.D. programs. No 400-level course may be used toward a graduate degree in Electrical Engineering except when required by the program.

400 Senior Design (5) Major design project focusing student's attention on practical design techniques. The project could be used to complete the M.S. plan, with permission of the student's faculty committee.

411 Digital Signal Processing and Filter Design (3) Discrete-time signals and systems, sampling, discrete Fourier transforms, analog filter characteristics, nonrecursive and recursive filter design, and CAD tools for filter design. Level 1 design projects which require laboratory work. Prereq: 410, permission of the faculty committee.

412 Linear Control System Design (4) Classical and modern techniques for design and compensation of linear feedback control systems. Bode design, root locus design, state variable pole placement design. Level 2 design projects which require laboratory work. Prereq: 411.

413 Electric Energy Systems (3) Structure and operation of electrical energy production, transmission, conversion, distribution, planning; control; reliability, balanced and unbalanced faults; load prediction; system stability. Level 1 design projects. Prereq: 412, 413.


423 Electric Machines (3) Principles of electromechanical energy conversion, design procedures for AC and DC machines, magnetic construction and performance constraints. Effects of machine parameters on steady state and dynamic performances; the dq model; reference frame transformation. Level 1 design projects. Prereq: 412, 413.

431 Operational Amplifier Circuits (3) Linear and non-linear active circuits using commercial operational amplifiers. Operational, instrumentation, isolation, bridge, rms and logarithmic conversion, monolithic ICs, electromagnetics, generators, rectifiers, references, active filters, modulation and demodulation, sinusoidal generators. Noise fundamentals and calculations for simple circuits. Design for specified pole-zero functions. Applications: transducer interfacing. Level 1 design projects which require laboratory work. Prereq: 412, 413.

432 Electronic Amplifiers (4) Feedback amplifier principles; wideband linear amplifier design; low-noise preamplifier design; linear regulated power supply design and low noise preamplifier design; linear operational amplifier circuits. Waveforms, shapes and waveforms, interference, noise, signal-to-noise ratio, amplifiers. Design for specified pole-zero functions. Applications: transducer interfacing. Level 1 design projects which require laboratory work. Prereq: 412, 413.

433 Antennas and Propagation (3) Antennas, wave theory, antennas in a dispersive medium. Antennas, propagation, communication link parameters, wave propagation in earth bound free space, earth's troposphere and ionosphere, reflections from earth, effects on link reliability. Level 1 design projects. Prereq: 441.

441 Digital Communications (3) Discrete Fourier Transform, linear and nonlinear signaling, digital communication in presence of noise, matched filtering and equalization, modulation, information theory. Level 1 design projects. Prereq: 432, Analog Communication Amplitude and Frequency Modulation.

442 Communication System Design (4) Application of communication system design principles to the design of communication systems. Development of communication system specifications. System simulation utilizing graphical programming language. Hardware and software design and simulation. Construction and performance evaluation of commercial or custom designed transmitters and receivers. Level 2 design projects. Prereq: 441.

451 Microprocessors and Microcontrollers in Electrical Engineering (3) Project oriented course using a microcomputer kit having monitor program and development system with microprocessor, memory, I/O devices, software tools for interrupt driven applications, Grade dependent upon number of projects completed, homework.
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when using University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E


504 Random Process Theory for Engineers (3) Probability and random variables as approached by set theory. Statistical averages and transformation of random variables. Random processes, stationarity, correlation functions and temporal analysis, power spectrum and spectral analysis as applied to response of systems to random signals.

505 Digital Signal Processing I (3) Discrete-time signals and systems, sampling, fast Fourier transform (FFT) and fast convolution, design of FIR filters and IIR filters.

506 Digital Signal Processing II (3) Filter properties in the Z and Fourier transform domains, structures for digital filters, filtering and sampling, computer implementation of digital filters.

507 Application of Numerical Linear Algebra in Systems and Control Engineering (3) (Same as Chemical Engineering 507 and Mechanical Engineering 507.)

511 Linear Systems Theory (3) State space models of linear systems. Signals and systems in the time, frequency and state space domains, state transformations, social matrices, controllability, observability, realization theory, and stability theory.

512 Multivariable Linear Control System Design (3) Control of multivariable systems, which satisfy constraints on robustness to plant uncertainties, disturbance rejection, command following. Prereq: 511.


522 Power Systems Analysis II (3) Operation and control of interconnected power systems, transient and dynamic stability. Formulating and solving problems in matrix-vector form with application to large scale power systems. Prereq: 521.

523 Power Electronics and Drives (3) Forced commutated inverters, dc/dc converters, brushless dc machine, microprocessors, drive system modeling, vector and scalar control of induction machines, parameter variations, control principles of synchronous machines.

524 High Voltage Systems (3) Phenomena, measurement techniques, high voltage test circuits. Testing, surge and arc control, shielding, reliability. Prereq: 421.

531 Advanced Analog Electronics I (3) Physical operation of modern electronic devices, semiconductor devices, diodes, bipolar transistors, J-FETs, and MOSFETs. Small-signal equivalent circuits and noise models of active devices. Project laboratory. Prereq: 431, 432, or consent of instructor.


545 Introduction to Microcomputer Networks and Components (3) Scattering and transfer representation for multipoles; unilateral and bilateral microwave and millimeter wave devices. Component and system parameter measurement by modern techniques. Electronic oscillators and amplifiers, frequency sweep oscillators, transient time devices, parametric devices, mixers, switches.

551 Digital Signal Design I (3) Signal considerations for combinatorial and sequential circuits. Iterative network design and fault diagnostics of systems.

552 Digital Signal Design II (3) State identification and structure realizations of sequential machines. Digital system architecture design: microprogramming and interrupt control. Prereq: 551.

561 Plasma Diagnostics I (3) Principles of active, passive, perturbing, and nonperturbing diagnostic methods used in low temperature plasmas and high temperature plasmas of interest in fusion research. Laboratory safety, data reduction and presentation, microprocessor based techniques, and reduction and reconstruction of time series data. Prereq: 461, 463, or consent of instructor.

562 Plasma Diagnostics II (3) Laboratory in operation of plasma diagnostic instruments in plasma science laboratory experience, with high voltage, vacuum, RF, and digital data handling techniques. Prereq: 561.

565 Industrial Plasma Engineering I (3) Low temperature plasma physics relevant to industrial applications: kinetics, chemistry, particle dynamic simulators, magnetic field, gaseous discharges, and electron, ion, and plasma sources. Prereq: Graduate standing or consent of instructor.

566 Industrial Plasma Engineering II (3) Continuation of 565 to industrial applications, magnetron sputtering, plasma deposition and etching, space propulsion systems, plasma chemistry, plasma lighting devices, insulating and superconductive materials processing with plasma arcs, and related topics. Prereq: 565 or consent of instructor.

571 Pattern Recognition (3) Decision-theoretic and structural approaches to pattern recognition. Deterministic and statistical decision rules, feature extraction and representation, syntactic and semantic methods. Prereq: 471 or consent of instructor.

572 Digital Image Processing (3) Spatial and transform processing of images. Neighborhood operators, image enhancement, restoration, and applications of mathematical morphology. Image representation and description. Prereq: 472 or consent of instructor.

573 Vision and Sensing for Robotics and Automation I (3) Acquisition, processing, integration, and interpretation of visual information. Sensing modalities as applied to autonomous and teleoperated robotic systems. Prereq: Consent of instructor.


581 Quantum Electronics I (3) Interaction of electromagnetic radiation with atoms and molecules. Com-parison of classical and quantumized models for emission and absorption. Oscillator spectral line, shape for amplifi-cation by stimulated emission of radiation and schemes


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) P/NP only, E.


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 rectifiers, thyristor converters, cycloconverters, fed ac drives, resonant converters, vector and scalar control of synchronous machines, static Kramer drives, static Scherbius drives, VSCF generation, modern control theory in ac drives.

624 Electrical Insulation (3) Principles, testing, and case studies. Basic principles of aging, losses, charging, conduction, and breakdown in vacuum, gas, liquid, solid, and composite insulation systems. Testing with low-noise instrumentation, pulse height analysis, optics, acoustics, and bridges; associated statistics and distributed parameter effects. Case studies drawn from active research, power systems, electronic circuits and devices, shielding, and stress grading. Prereq: 503, 504, and consent of instructor.

631 Advanced Topics in Electronic Instrumentation I (3) Based on particular interests of students. Fundamental physical processes in instrumentation transducers: thermoelectric, magnetoelectric, electromechanical and quantum-mechanical devices. Prereq: 531-32 and consent of instructor.


643 Detection and Estimation Theory (3) Detection 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 scheme, maximum likelihood, stochastic, and hierarchical methods. Prereq: 643.

651 Computer-Aided Design of VLSI Systems I (3) Fabrication of microelectronic devices; computer architecture design; algorithmic state machines; partitioning; structured design methodology. Prereq: 551-2 or consent of instructor.

652 Computer-Aided Design of VLSI Systems II (3) Computer-aided design tools; design and implementation of fully custom very large scale integrated (VLSI) circuits; design for testability; testing of fabricated chips. Prereq: 551.

653 Advanced Plasma Physics I (3) Basic concepts of high temperature plasma physics. Magnetohydrodynamical and kinetic descriptions of plasma, plasma transport, plasma waves, equilibrium, and stability. Prereq: Physics 541-2, 461-2 or 563-4, or consent of instructor. (Same as Physics 663.)

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 system. 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 to Ph.D. students in Electrical Engineering. May be repeated. Maximum 9 hrs.

### Engineering Science

See Mechanical and Aerospace Engineering and Engineering Science

### English

(College of Arts and Sciences)

<table>
<thead>
<tr>
<th>MAJOR</th>
<th>DEGREES</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>M.A., Ph.D.</td>
</tr>
</tbody>
</table>

Professors:

- Adams, Percy G. (Emeritus), Ph.D., Texas
- Bratton, Edward W., Ph.D., Illinois
- Carroll, D. Allen, Ph.D., North Carolina
- Cox, Don R., Ph.D., Missouri
- Curry, Kenneth (Emeritus), Ph.D., Yale
- Drake, Robert Y., Jr., Ph.D., Yale
- Enso, Allison R., Ph.D., Indiana
- Finneran, Richard J. (Hedges Chair of Excellence), Ph.D., North Carolina
- Fisher, John H. (Emeritus), Ph.D., Pennsylvania
- Garner, Stuart B., Jr., Ph.D., Princeton
- Gill, J. E., Ph.D., North Carolina
- Goslee, David F., Ph.D., Yale
- Goslee, Nancy M. (Distinguished Prof.), Ph.D.
- Heffernan, Thomas J., Ph.D., Cambridge
- Hutchinson, George, Ph.D., Indiana
- Kallet, Marilyn, Ph.D., Rutgers
- Keene, Michael, Ph.D., Texas
- Kelly, Richard M. (Lindsay Young Prof.), Ph.D., Duke
- Leggett, J. (Distinguished Prof.), Ph.D., Florida
- Lekin, Ilona, Ph.D., Illinois
- Lotaro, Michael A., Ph.D., Maryland
- Maland, Charles J. (Lindsay Young Prof.), Ph.D., Michigan
- Penner, A. Richard, Ph.D., Colorado
- Reese, Jack E. (Univ. Prof.), Ph.D., Kentucky
- Senders, Norman J. (Emeritus), Ph.D., Northwestern
- Schneider, Daniel U. (Emeritus), Ph.D.
- Shurr, William (Emeritus), Ph.D.
- Stewart, Bain T. (Emeritus), Ph.D.
- Stillman, Robert, Ph.D., Pennsylvania
- Trathem, Joseph B., Jr., Ph.D., Princeton
- Wier, Allen, M.F.A., Bowling Green
- Wier, Thomas V., Ph.D., North Carolina
- White, Jon M. (Emeritus), M.A.
- Wright, Nathalie (Emeritus), Ph.D.

Associate Professors:

- Atwell, Janet, Ph.D., Purdue
- Benson-Myers, Linda D., Ph.D., Oregon
- Dumas, Bethany K., Ph.D., Arkansas
- Dunn, Allen, Ph.D., Washington
- Hirst, Russell, Ph.D., Rensselaer
- Howes, Laura L., Ph.D., Columbia
- Jennings, LaVina, Ph.D., North Carolina
- Papke, Mary E., Ph.D., McGill
- Smith, Arthur, Ph.D., Houston
- Zornick, John (Liaison), Ph.D., Columbia

Assistant Professors:

- Anderson, Misty G., Ph.D., Vanderbilt
- Bhatt, Rakesh, Ph.D., Illinois
- Black, Joseph L., Ph.D., Toronto
- Eavey, John O., Ph.D., Duke
- Hammonette, Patsy G., M.A., Tennessee
- Moskowitz, Kenneth, Ph.D., Berkeley
- Voss, Randall G., Ph.D., Texas

The Department of English offers the Master of Arts and the Doctor of Philosophy degrees with a major in English. Thesis and non-thesis options are available for the M.A. as well as a special concentration in writing.

Detailed information about the master's and doctoral programs, and about individual graduate courses, may be obtained by writing the Director of Graduate Studies in English, 306 McClung Tower. A prospective student must contact the department to receive the proper information and forms with which to apply. For additional information, please visit the graduate website through the College of Arts and Sciences home page at www.artssci.utk.edu.

The Department of English does not accept students in non-degree or provisional status. A student who wishes to enter the department must apply in degree-seeking status for his/her application to receive consideration for admission to any graduate program in English.

### THE MASTER’S PROGRAM

#### Requirements

Coursework: A minimum of 24 semester hours in English beyond the B.A., to include 6 hours at the 600 level; 12 additional hours at the 500-600 level (Only 3 hours of 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 Knoxville with a grade of B or better.
3. Passing of the regular Ph.D. foreign language examination as currently administered at UT Knoxville.

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 major in a substantial way. Examples of capstone experiences include, but are not limited to, the completion of a thesis or the formal 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 at the office of the Director of Graduate Studies in English.

A non-thesis student must pass a written examination, followed by a one-hour oral examination, both consisting of the same sort of questions as the examination taken by the thesis student.

Residence Requirement: There is no residence requirement for the M.A., but students should attempt to pursue a full-time program whenever possible.

WRITING CONCENTRATION

The master’s program with writing concentration is intended for those students who plan to do free-lance writing, specialize in teaching writing courses at the college level, or work as professional writers in business or industry.

Requirements

The requirements for the writing concentration are the same as those for the thesis option above with the following exceptions:

Coursework: Writing students may substitute two 400-level writing courses for two 500-level courses. Students must take at least 9 hours in writing and in literature, the remaining 6 to be selected from any English courses at the proper level. Of the courses in writing, at least 3 hours must be taken at the 500 level; additional 500-level courses are strongly recommended.

Writing Projects: One of the following writing projects for six hours of credit:

1. A thesis, using research to analyze some aspect of writing or rhetorical theory.
2. A creative project, such as a collection of poems or short stories, a short novel, a play, or a creative work of non-fiction prose.

The nature and length of each project will be determined by the Director of Graduate Studies after consulting with the student and the project director. In addition to the director, two other English faculty members will supervise and approve the project; at least one should be from the literature faculty.

Final Examination: The reading list may be modified by the M.A. examining committee, meeting as a body with the student, to reflect the candidate’s particular writing emphasis. However, most of the oral examination should focus upon the literature outlined in the original reading list.

THE DOCTORAL PROGRAM

Requirements

A student must successfully complete a program of study, normally 6 full semesters as outlined below, approved by the candidate’s committee or the Director of Graduate Studies in English.

Coursework: At least 51 semester hours beyond the B.A. (or 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 special three-hour course in teaching composition; and 12 additional hours at any level, including the 400 level. 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-hour 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 Knoxville 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 Knoxville.

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 Knoxville 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 some of which must be from English 508 or 509 History of the English Language (offered in alternate years only). For the other 3 hours, the student may either complete the history of the language sequence or choose one other course in language taught in the Department of English at the 500 or 600 level and approved by the Director of Graduate Studies in English. These courses will not count toward the minimum number of courses for the Ph.D., and anyone electing this language option may not take the comprehensive examination in linguistics.

Examinations: (1) A 4-hour qualifying examination taken before the end of the first year of Ph.D. coursework; this examination is given three times a year, with the M.A. written examination. (2) A comprehensive written examination which may be divided as the department directs; see the English Department graduate brochure. The comprehensive examination is given twice a year, normally in March and September. Before a student may take it, he/she must have completed all coursework required. A student must also have met all requirements for foreign languages before beginning the first part of the examination.

Dissertation Defense: A one-hour examination on the dissertation and other related areas.

Residence Requirement: Two consecutive semesters as a full-time student. For students not on teaching assistantships, full-time consists of 9 or more hours of coursework and/or dissertation hours each semester. For students on assistantships, full-time is defined as 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 Twelfth Night; English histories, including Henry IV; and early tragedy, including Hamlet.

405 Shakespeare II: Later Plays (3) Shakespeare's dramatic achievement between 1601 and 1613. Reading and discussion of selected plays from great tragedies, including Othello; problem plays, including Measure for Measure; and dramatic romances, including The Tempest.

406 Renaissance Drama (3) English theatre between 1590 and 1640 through reading of representative plays by Shakespeare’s contemporaries: Marlowe, Webster, Jonson.

409 Spenser and his Contemporaries (3) Principal achievements in prose and poetry of sixteenth century authors; Spenser, Wyatt, Marlowe, More, Sidney, and Bacon.

410 Milton, Donne and their Contemporaries (3) Principal achievements in prose and poetry of first two-thirds of seventeenth century: poetry of Milton, Donne, Marvell; and prose of Browne, Bacon, Welton.

411 Literature of Restoration and Early Eighteenth Century: Dryden to Pope (3) Survey of English literature and culture from 1660 to 1714.

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.
Entomology and Plant Pathology

(College of Agricultural Sciences and Natural Resources)

MAJOR DEGREE
Entomology and Plant Pathology .......... M.S.

Charles D. Pless, Acting Head

Professors:
Bernard, Ernest C., Ph.D. .......... Georgia
Erhard, Reid R. (Liaison), Ph.D. ...... NC State
Hilty, James W. (Emeritus), Ph.D. .... NC State
Johnson, Leander F. (Emeritus), Ph.D. ................................ Louisiana State
Lambdin, Paris L., Ph.D. ................... VPI
Pless, Charles D., Ph.D. ............... Clemson

Associate Professors:
Grant, Jerome F., Ph.D. .......... Clemson
Gwinn, Kimberly D., Ph.D. .......... NC State
Redick, Bradford B., Ph.D. .......... NC State
Windham, Mark T., Ph.D. ............. NC State

Assistant Professor:
Owleny, Bonnie H., Ph.D. .......... NC State

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 ecology, 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 School and have completed (1) general botany or biology, 8 hours; (2) advanced biological sciences, 8 hours; (3) general inorganic chemistry, 6-8 hours; (4) organic chemistry, 3 hours. In addition, three completed writing forms and a written statement of career goals and interest in entomology or plant pathology are required.

Degree Requirements
The program requires a written thesis based on original research and the completion of a minimum of 24 hours of coursework for graduate credit, approved by the student’s advisory committee. Included in the course requirements are two acceptable seminar presentations for 1 hour each. An oral final exam must be passed to the satisfaction of the advisory committee after the thesis has been completed. A minor is not required but may be selected at the option of the student. The minor will include at least 6 hours and not more than 10 hours of graduate-level credit in the minor department. The student’s committee shall include a member of the faculty from the minor department to assist in designing courses required for the minor.

GRADUATE COURSES

410 Diseases and Insects of Ornamental Plants (3) Symptoms, identification and management of diseases and insects that affect plants in greenhouses, nurseries, and landscape environments. Prereq: Plant Pathology or Economic Entomology or consent of instructor. Sp,A

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

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

510 Plant Disease Fungi (4) Morphology, taxonomy, and biology and genetics of plant pathogenic fungi. Isolation and identification of plant pathogenic fungi. Prereq: 313 or consent of instructor. 2 hrs 2 labs. (Same as Plant Pathology and Landscape Design 511.) F,A

512 Soilborne Plant Pathogens (3) Causal agents; host-parasite-soil environment interactions; epidemiology; and biological control. Prereq: Plant Pathology or consent of instructor. F,A

514 Bacterial Plant Diseases (4) Morphology, taxonomy, physiology, and genetics of bacterial plant pathogens; infection and disease development, pathogenesis and resistance, diagnosis, detection, effect of environment, and management of bacterial plant diseases; beneficial plant-bacterial interactions. Prereq: Plant Pathology or consent of instructor. 3 hrs and 1 lab. Sp,A

515 Physiology of Plant Disease (3) Biochemical and physiological events involved in host-pathogen interactions. Mechanisms of disease resistance. Prereq: Introductory plant physiology and pathology, or consent of instructor. F,A

520 Plant Parasitic Nematodes (4) Morphology, taxonomy, ecology, and management of plant parasitic nematodes, host-parasite relationships. Prereq: 6 hrs botanical science or consent of instructor. 2 hrs and 2 labs. Sp,A

521 Plant Virology (3) Symptomatology, epidemiology, and management of virus infection; structure, morphology, replication, transmission, purification, characterization, and classification of plant viruses; reovirus, plant parasitic viroids, mycoplasmas and viromas. Prereq: 313 or consent of instructor. 2 hrs and 1 lab. Sp,A

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. F,A

525 Medical and Veterinary Entomology (3) Morphology, taxonomy, biology, and control of arthropod parasites and vectors of pathogens of humans and animals. Prereq: Entomology and biological behavior of vectors in relation to pathogen transmission and control. Prereq: 321 or 325, or consent of instructor. 2 hrs and 1 lab. Sp,A

530 Integrated Pest Management (3) Principles and 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 500.) F,A

531 Special Problems in Entomology (1-3) Comprehensive individual study of current problems. May be repeated. Maximum 6 hrs. E

532 Special Problems in Plant Pathology (1-4) Comprehensive individual study of current problems. May be repeated. Maximum 6 hrs. E

533 Concentrated Study in Entomology (1-3) Selected subjects in entomology for advanced students, concentrated in time and subject matter. Prereq: 321 or basic
Environmental Engineering

See Civil Engineering

Exercise Science

(College of Education)

MAJORS DEGREES

Education .......................... Ph.D.
Human Performance and Sport Studies .... M.S.

W. Liemohn, Leader

Professors in:

Liemohn, W. P., Ph.D. .......... Michigan
Namey, T. C., M.D. ....... Washington (St. Louis)
Rockett, Ian R. H., Ph.D. .......... Brown

Ph.D. Florida

Associate Professor:

Bassett, David R., Jr., Ph.D. .......... Wisconsin

Assistant Professors:

Thompson, Dixie, Ph.D. .......... Virginia
Zhang, Songling, Ph.D. .......... Oregon

The Exercise Science unit participates in graduate programs leading to degrees, majors, and concentrations in:

Master of Science

Human Performance and Sport Studies

Exercise science

Doctor of Philosophy

Education

Exercise science

See Education under Fields of Instruction for full description of all degree requirements.

The unit promotes and integrates scientific approaches for preventing or controlling occurrence of disease. Faculty and students work with clients, within communities, and within the larger educational and health-care system. This approach requires a broad-based background needed for application to graduate programs in exercise science, physical therapy, cardiac rehabilitation, public health, exercise psychology, athletic training, or public school teaching. Graduate students and faculty focus on research dealing with theoretical and applied aspects of exercise and sport.

ADMISSION REQUIREMENTS

Applicants are required to complete the unit application which will be sent to all persons upon their initial inquiry about the program. This is in addition to the Graduate School application.

The following retention policy applies to all graduate students seeking a degree in the Exercise Science unit:

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 unit leader of the need to discuss the matter with his/her advisor.
3. If a student's overall GPA remains below 3.0 for a second semester, the student will have his/her degree status revoked.

GRADUATE ASSISTANTSHIPS

A limited number of graduate assistantships are available for qualified women and men who are graduates of accredited colleges or universities. These assistantships are open to students in the master's and doctoral programs. Students interested in these opportunities should file their applications before February. Letters should be addressed to Graduate Assistantships Coordinator, Exercise Science Unit, The University of Tennessee, Knoxville, TN 37996-2700.

GRADUATE COURSES

403 Physiology of Exercise (3) Functions of body in muscular work; physiological aspects of fatigue, training and adaptation to environment. Prereq: Human Physiology or general physiology. 2 hrs and 1 lab. (Same as Biochemistry and Cellular and Molecular Biology 460.)

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

501 Special Project (3) Culminating experience for nonthesis major. Research study suitable for publication, or practicum requiring special written work.

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


508 Research in Exercise Science (3) Research for writing of thesis and institutional review board proposal, 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 Orthopaedic Rehabilitation (3) Effect of physical activity on bone and soft tissue development, anatomical and mechanical implications of exercise, theoretical bases for rehabilitation strategies.

516 Therapeutic Exercise (3) Therapeutic exercise programs designed for specific pathologies: McKenzie, neutral spine; based on specific biomechanical considerations: eccentric, closed kinetic chain; and more general in nature: Feldenkrais, myofascial release.

521 Analytic Epidemiology (3) Epidemiologic strategies for evaluating research questions concerning causes, prevention and treatment of morbidity and disability. Presentation by experts working with large population-based datasets. Research process: grant writing and protocol preparation. Prereq: Course in statistics or consent of instructor.

525 Epidemiology of Injury and Violence (3) Epidemiologic methods to describe magnitude and examine etiology of unintentional and intentional injury. Alternative approaches for preventing or controlling occurrence of injury and violence in both general population and high risk sub-populations.
Relationship between primary and secondary mortgage markets and impact of those markets on the credit decisions of borrowers. Effects of government intervention (taxation, subsidization, and regulation) in both real estate and mortgage markets. Prereq: Business Administration 504 and consent of instructor.

599 Special Topics in Finance (1-3) Topics vary. Prereq: Consent of Instructor. May be repeated. Maximum 6 hrs. S/NC or letter grade.

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


642 Seminar in Finance II: Theory of the Firm (3) Financial theory of firm and financial decision making under conditions of uncertainty. Equilibrium models of firm. Option pricing, agency theory, capital structure, economics of information, and dividend policy.

651 Advanced Seminar in Finance I (3) Recent theoretical and empirical developments in micro-finance literature. Topics vary. May be repeated. Maximum 6 hrs.

652 Advanced Seminar in Finance II (3) Recent theoretical and empirical developments in macro-finance literature. Topics vary. May be repeated. Maximum 6 hrs.

Food Science and Technology

(College of Agricultural Sciences and Natural Resources)

MAJOR

Food Science and Technology ....... M.S., Ph.D.

Clark J. Brekke, Head

Professors:

B Brekke, C. J., Ph.D. ................. Wisconsin
Collins, J. L., Ph.D. ..................... Maryland
Draughon, F. A., Ph.D. ............... Georgia
Jaynes, H. O. (Emeritus), Ph.D. ...... Illinois
Melton, S. L., Ph.D. .................... Tennessee
Miles, J. T. (Emeritus), Ph.D. ........ Wisconsin
Overcast, W. W. (Emeritus), Ph.D. .... Iowa State
Parfield, M. P., Ph.D. .................. Tennessee

Associate Professors:

Loveday, H. D., Ph.D. ............... Kansas State
Mount, J. R., Ph.D. ..................... Ohio State

Assistant Professors:

Beattie, S. E., Ph.D. ............... Oregon State
Golden, D. A. (Liaison), Ph.D. ...... Georgia
Hulbert, G., Ph.D. ..................... Illinois
van Laak, R. L., Ph.D. ............... Utrecht

The Department of Food Science and Technology offers the Master of Science and Doctor of Philosophy degrees. Students in the doctoral program may choose research in the concentration areas of food processing, food chemistry, food microbiology or sensory evaluation of foods. Commodity interests (meats, dairy, fruits, vegetables, bakery products) can be emphasized in any of the areas by careful selection of courses and the research topic. Minors are available in cognate fields. For detailed information, contact the department head.

Graduate School rating forms or letters of recommendation from at least three people are required. Respondents should be familiar with the applicant's scholastic ability and professional potential.

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 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 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. Scores on the GRE aptitude test are also required.

2. A dissertation is required for the Ph.D. degree. Each student must develop a detailed written plan for the dissertation research. 3. A minimum of 72 hours beyond the Bachelor's degree, excluding credit for the master's thesis, is required. Of this, 24 semester hours must be 600 Doctoral Research and Dissertation. 4. At least 24 hours of coursework numbered above 500 are required exclusive of doctoral research and dissertation. At least 6 of
the 24 hours must be courses numbered above 600.
5. A minimum of 6 hours of courses for graduate credit must be taken outside the Department of Food Science and Technology.
6. All candidates must complete 601 (2 hrs.) and are expected to attend 601 during their Ph.D. program.
7. Each candidate must pass both written and oral comprehensive examinations prior to admission to candidacy. Major professors will advise candidates on competencies expected. A final oral examination is required that includes a defense of the dissertation and subject matter that the student's committee considers appropriate.

GRADUATE COURSES

430 Sensory Evaluation of Food (3) Principles and methods of sensory evaluation of foods. Prereq: Basic statistics. 2 hrs and 1 lab. F
452 Science of Dairy Foods (3) Science and technology of processing of milk and its products. Prereq: Food Laws and Regulations, Food Chemistry, Food Microbiology and Lab, and Food Preservation or consent of instructor. 2 hrs and 1 lab. Sp
460 Meat Science (3) Carcass characteristics of meat animals, muscle structure and composition, cut identification, curing, freezing and cookery. Prereq: Food Industry or consent of instructor. Sp
469 Meat Science Lab (1) Slaughter and processing methods for beef, pork, lamb and poultry. Coreq: 460. Sp
470 Food Crop Products (3) Food products from plants: types, manufacturing systems, quality attributes and utility. Prereq: Food Preservation and 3 hrs biological sciences or consent of instructor. Sp
480 Cereal Science and Bakery Products (3) Chemistry and technology of processing cereal grains, interactions of ingredients during production and storage of bakery products. Prereq: Food Laws and Regulations, Food Chemistry, and Food Preservation or consent of instructor. 2 hrs and 1 lab. Sp
495 Food Processing System Analysis and Evaluation (3) Design and evaluation of food processing operation to produce safe and acceptable quality food product. Prereq: Food Chemistry, Food Microbiology, Food Preservation or consent of instructor. Sp
500 Thesis (1-15) P/NP only. E
501 Seminar (1) Individual reports and discussion on topics from current literature. May be repeated. Maximum 3 hrs. F,Sp
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E
503 Problems in Lieu of Thesis (2-3) May be repeated. S/NC only. E
510 Instrumental Analysis of Food (3) Modern instrumental methods for control of food manufacturing processes. Prereq: Food Chemistry. 2 hrs and 1 lab. F
511 Color of Foods (2) Chemical basis, measurements, and reactions involved in color changes in foods. Manufacture and application of materials used to modify color of foods. Prereq: Food Chemistry or equivalent. 1 hr and 1 lab. F, A
512 Flavor of Foods (2) Chemical basis, measurements, and reactions involved in flavor changes in foods. Manufacture and application of materials used to modify flavor of foods. Prereq: Food Chemistry or equivalent. 1 hr and 1 lab. F, A
515 Food Carbohydrates, Proteins and Lipids (4) Advanced study of chemical and physical attributes of carbohydrates, protein, and lipid components of foods; effects of components on production of and/or distribution of food products. Prereq: Food Chemistry or equivalent. 3 hrs and 1 lab. Sp
520 Food and Industrial Fermentations (3) Microbiology, biochemistry and technology of food-related fermentations involving dairy products, meat, cereals, fruits and vegetables. Production of food ingredients and by-product utilization. Prereq: Food Microbiology and Lab, Food Preservation, Biochemistry and Cellular and Molecular Biology 410 or equivalent. 2 hrs and 1 lab. Sp, A
521 Advanced Food Microbiology (3) Extrinsic and intrinsic factors associated with food-borne and food processing that effect growth, survival, infection, detection, and recovery of foodborne pathogens and spoilage organisms; traditional and current approaches to microbiological safety and quality. Prereq: Food Microbiology and Lab or equivalent. 2 hrs and 1 lab. Sp, A
540 Food Product Development (3) Art, science and technology of developing and marketing new food products. Prereq: Food Preservation. 2 hrs and 1 lab. Sp, A
550 Advanced Meat Science (3) Physical and chemical changes that occur in muscle to meat; effect of postmortem and processing on meat quality, composition, palatability, packaging, and quality control. Prereq: 460. 2 hrs and 1 lab. Sp, A
560 Food Oils and Fats (2) Chemistry and technology of food oils and fats. Production of and use of oils from edible seeds. Prereq: Food Chemistry or equivalent. 1 hr and 1 lab. Sp, A
590 Special Topics in Food Technology and Science (1-3) Critical reviews of current research and production concerns of food industry. May be repeated. Maximum 9 hrs. F, Sp
593 Directed Studies (1-3) Research on non-thesis topics chosen by student and major professor. Supervised experience in food industry or governmental laboratories. May be repeated. Maximum 6 hrs. E
600 Doctoral Research and Dissertation (3-15) P/NP only. E
601 Seminar (1) Reports and directed discussion on research topics from current literature. May be repeated. Maximum 3 hrs. F, Sp
620 Food Toxicology (2) Basic and applied concepts of food toxicology; toxicological aspects of processed foods. Modes of action, prevention and control of food toxicants in food supply. Prereq: Food Chemistry, 521, or consent of instructor. Sp, A
640 Advanced Food Processing (3) Role of processing treatments in modification of food properties; texture, flavor and color characteristics. Prereq: Food Preservation, 510, 511, 512 or consent of instructor. Sp, A

Forestry, Wildlife and Fisheries

(College of Agricultural Sciences and Natural Resources)

MAJORS

DEGREES

Forestry ............................................. M.S.
Wildlife and Fisheries Science ................ M.S.

George M. Hopper, Head

 Professors:
Barrett, J. W. (Emeritus), Ph.D................. Syracuse
Buckner, E. R. (Emeritus, Distinguished Prof.), Ph.D. ................. NC State
Core, H. A. (Emeritus), Ph.D. ................. Syracuse
Daarshen, B. L. (Emeritus), Ph.D.............. Colorado State
Dimick, R. W., Ph.D. ...................... Wyoming
Hill, T. K., Ph.D. .......................... Auburn
Hopper, G. M., Ph.D. ....................... VPI
Ostermayer, D. M., Ph.D. .................... Syracuse
Pelton, M. R., Ph.D. .......................... Georgia
Rennie, J. C., Ph.D. .......................... NC State
Schneider, G., Ph.D. ......................... Michigan State
Sharp, J. B. (Emeritus), D.P.A. .............. Harvard
Strange, R. J., Ph.D. ...................... Oregon State

Stumbo, D. A. (Emeritus), Ph.D. ........ Minnesota
Thor, E. (Emeritus), Ph.D. ................. NC State
Wilson, J. L., Ph.D. .......................... Tennessee
Winistorfer, P. M., Ph.D. ................... Iowa State

Associate Professors:
Buehler, D. A., Ph.D. ....................... VPI
Hay, R. L., Ph.D. ............................ Duke
Scharlaume, S. E., Ph.D. .................. Colorado State
Wells, G. R. (Liaison), D.F. ................. Duke

Assistant Professors:
Bond, B. H., Ph.D. ......................... VPI
Fly, J. M., Ph.D. ............................ Michigan

Graduate study leading to the Master of Science degree in Forestry and in Wildlife and Fisheries Science is offered by the Department of Forestry, Wildlife and Fisheries. The Master of Business Administration, with a concentration in forest industries management, is available for qualified students. This degree program is offered by the College of Business Administration with participation by the Department of Forestry, Wildlife and Fisheries. The Doctor of Philosophy can be achieved through the University's program in Ecological and Evolutionary Biology.

The mission of the Department of Forestry, Wildlife and Fisheries is to advance the management and utilization of natural resources in Tennessee, the region and beyond through programs in teaching, research and extension.

THE MASTER'S PROGRAMS

Both thesis and non-thesis options are available for the major in Forestry; a thesis is required in Wildlife and Fisheries Science. For admission the student must have a Bachelor's degree from an accredited institution in Forestry, wildlife, fisheries, or other natural resource area. Applicants must take the general Graduate Record Examination (GRE) with minimum scores required. Graduate School rating forms or letters of recommendation from three individuals familiar with the applicant's academic ability are required. The department also has an application that must be submitted at the time of application to The Graduate School.

Thesis Option
1. Prior to research for the thesis, the student is required to develop a detailed written research proposal. Registration for 6 hours of Thesis (Forestry 500 or Wildlife and Fisheries Science 500) is required.
2. A graduate committee of a no fewer than 3 faculty members must be selected by the second semester of residence. At least one member shall be from outside the department. In addition to the thesis requirement, a minimum of 24 hours of graduate coursework is required. This work must be approved by the student's committee and no more than 10 hours of the minimum 30 can be below the 500 level. The committee may require additional coursework if the student's progress or background indicates such need.
3. All students are required to include Forestry 512 or Wildlife and Fisheries 512, Seminar, in their programs. This is required of each graduate student in residence fall semester.
4. An oral examination covering the thesis and coursework is required.
Forestry, Wildlife and Fisheries

GRADUATE COURSES

421 Forest and Wildland Resource Economics (3) Production functions, supply-demand and market analysis, non-marketed products and projects; economic analysis and decision models; investment and financial analysis; managerial economics; taxes; forest products marketing. Prereq: Forest Resource Analysis or consent of instructor. F

422 Forest and Wildland Resource Policy (3) Policy formulation; criteria for policy determination; forest and wildland law and regulation; theory of conflict resolution; formal and informal resolution. Prereq: Senior standing or consent of instructor. F

423 Wildland Recreation Planning and Management (3) Planning processes, master and site planning, design projects; management strategies; methods of visitor and recreation site management; case studies. Weekend field trips. Prereq: Wildland Recreation or consent of instructor. 2 hrs and 1 lab. Sp

433 Wood Adhesives and Glued Wood Products (2) Theory and practice of adhesive bonding of wood; wood-adhesive interface for bonding; principles of adhesion; wood adhesives; gluing of solid wood and composite wood manufacturing practices; laboratory manufacture and testing of adhesives, adhesive bond strength and glued-wood product performance; day field trips. Prereq: Wood Properties and Wood Identification, or consent of instructor. 1 hr and 2 labs. F

434 Wood Processing and Machining (2) Primary log breakdown and secondary processing into major products. Fundamentals of machining technology for major types of cutting operations; sawing, boring, planning, veneer cutting, and laser machining; day field trip. Prereq: Wood Properties and Wood Identification, or consent of instructor. 1 hr and 2 labs. Sp

435 Wood Drying and Preserving (2) Discussion of wood-moisture relationships. Introduction to commercial wood drying equipment and practices. Proper use, specification, and disposal of preservative treated wood. Day field trips. Prereq: Wood Properties and Uses and Wood Identification, or consent of instructor. F

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

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

511 Problem Analysis in Forest Resources (3) Problem identification, analysis and solution in forest resources management; identity, analyze and prepare written report. Topic and report must have approval of graduate committee. Only available to students in non-thesis option for M.S. in Forestry. E

512 Seminar (1) Current developments in forestry. Required of all graduate students in residence fall. May be repeated. Maximum 2 hrs. S/N only. F

520 Advanced Forest Tree Biology (3) Growth, reproduction, and physiology of trees; forest ecology; variability and taxonomy of forest trees. Prereq: Graduate standing in forestry or biological science, or consent of instructor. F, A

530 Advanced Forest Resource Management (3) Analysis of forest management problems as exemplified in public agencies and private firms. Forest organization and computerized record systems; financial and operational planning tools, as applied to forest resource management. Prereq: Senior-level forest management or consent of instructor. F, A

540 Genetics in Forestry (3) Genetic improvement of forest trees, selection of superior phenotypes; field testing for genetic variability; tree breeding; development of seed orchards; hybridization; tree cytology and tissue culture; use of biochemical variation, plant and human forest genetics research. Prereq: Silvicultural methods and Biology 220 or consent of instructor. Sp, A

550 Recreation Planning for Forests and Associated Lands (3) Planning process for recreation development on forests and associated lands; analysis and critique of specific contemporary alternatives. Overnight field trips. Prereq: Senior level in forest recreation or consent of instructor. F, A

570 Management & Policy of Forest Resource Organization (3) Theory and application of management as applied to natural resource organizations: institutional direction and 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. Prereq: Forestry administration and policy or consent of instructor. F, A

580 Advanced Silviculture (3) Silvicultural characteristics, silvicultural practices and systems applied to commercial important hardwoods and softwoods. In-depth analysis of silvicultural principles and management of forests. Used in prescribed fire, pesticides, in regeneration and management; computer modeling of stand dynamics, structure, growth/yield. Prereq: Undergraduate silviculture course or consent of instructor. 2 hrs and 1 lab. Sp, A

585 Advanced Forest Biometry (3) Application of sampling techniques to forest inventory; fixed and variable plot sampling; liet sampling; Poisson sampling; regression estimation; multistage and multphase sampling. Growth and yield predictors for even-aged and uneven-aged forests. Prereq: Land Measurement Techniques and Forest Resource Inventory or consent of instructor. F, A

590 Advanced Topics in Forestry (1-3) Recent advances and concepts; research techniques and analysis of current problems. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

593 Independent Study in Forestry (1-4) May be repeated. Maximum 6 hrs. E

Evaluation, modeling, and management of wildlife habitat. Effects of land-use practices on wildlife habitat. Weekend field trips. Prereq: Principles of Wildlife and Fisheries Management or consent of instructor. Applicable to majors in Forestry and Wildlife and Fisheries Science. 2 hrs and 1 lab. F

416 Planning and Management of Forest, Wildlife and Fisheries Resources (3) Integrated forest and wildlife resource management through developing land management plans and analyzing the social implications of conflicts. Resolution, applicable to majors in Forestry and Wildlife and Fisheries Science. Prereq: Senior standing 1 hr and 2 labs. Sp

525 Management of Forestry, Wildlife and Fisheries Resources (2) Current technologies and management strategies concerning use of forest, wildlife, and fisheries resources necessary for decision making and implementation. Prereq: 6 hrs of biological sciences or consent of instructor. Not available to students in forestry or wildlife and fisheries science. 4 hrs and 1 lab for six weeks. Sp

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 for attaining environmental objectives. Overnight field trips. Prereq: 416 or equivalent or consent of instructor. Applicable to majors in Forestry and Wildlife and Fisheries Science. Sp

450 Seminar on Integrated Resources Management in Biosphere Reserves (2) MASON/UNESCO-sanctioned global conservation initiative. Analysis of integrated resource management practices that demonstrate a commitment to sustainability and international cooperation. Environmental policy and application of science to management practice. Applicable to majors in Forestry and Wildlife and Fisheries Science. Sp

Wildlife and Fisheries Science

GRADUATE COURSES

440 Wildlife Techniques (2) Methods of wildlife damage control, forest, farmland, wildlife habitat management, identification of wildlife field signs, wildlife capturing techniques and management plan preparation. Weekend field trips. Prereq: Principles of Wildlife and Fisheries Management or consent of instructor. 1 hr and 1 lab or field. F

442 Fisheries Techniques (2) Active and passive sampling techniques for fish and aquatic organisms; population estimation methods; fish handling and transport; food habits analysis; marking and tagging techniques; age determination and incremental growth analysis; stream assessment techniques; fish habitat improvement and maintenance; safety in sampling methods. Weekend field trip. Prereq: Principles of Wildlife and Fisheries Management or consent of instructor. 1 hr and 1 lab or field. F

443 Fisheries Science (3) Quantification and management of freshwater fisheries; population estimation, age and growth, biological assessment, and stocking. Prereq: Principles of Wildlife and Fisheries Management or consent of instructor. 2 hrs and 1 lab. Sp

444 Ecology and Management of Wild Mammals (3) Biological and ecological characteristics of game mammals and endangered mammals. Current principles and practices of wild mammal management. Prereq: Principles of Wildlife and Fisheries Management or consent of instructor. 2 hrs and 1 lab. Sp

445 Ecology and Management of Wild Birds (3) Biological and ecological characteristics of game birds, endangered birds, and bird pests. Current principles and practices of wild bird management. Prereq: Principles of Wildlife and Fisheries Management or consent of instructor. 2 hrs and 1 lab. Sp

480 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 effective wildlife and fisheries scientists and managers, and foresters to acquaint students with diverse perspective of ethical behavior in

500 Thesis (1-15) PINF only. E

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

512 Seminar in Wildlife and Fisheries Science (1) Current developments in wildlife and fisheries science. Required of all graduate students in residence or at a distance. May be repeated. Maximum 2 hrs. S/CN only. F

520 Planning and Administration of Fisheries and Wildlife Programs (2) Factors influencing policy and program planning activities of fisheries and wildlife agencies. Decision-making policies, case histories. Sp, A

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. Prereq: Graduate standing or consent of instructor. Sp, A

530 Wildlife Diseases (2) Necropsy of birds and mammals. Recognition of various diseases and methods of preparing pathological material in field and lab. Investigative procedures concerning wildlife diseases. Prereq: 1 yr biology, 444 or 445, or consent of instructor. (Same as Comparative and Experimental Medicine - Veterinary Medicine 530). F-A

540 Predator Ecology (2) Dynamics of terrestrial vertebrate predator populations in human-altered and relatively unaltered environments. Prereq: 444 or 445 or consent of instructor. F-A

545 Population and Habitat Analysis (2) Detail characteristics, assumptions, and current technologies for fish and wildlife population analysis. Techniques, methodology and goals for wildlife habitat analysis. Use of computers. Prereq: Allied 500, 571 or Statistics 530 or consent of instructor. F-A

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. Sp-A

556 Recirculating Aquaculture (3) Growing fish in intensively designed, indoor systems with recycled water. Techniques of solids removal, nitrification, and gas balances. Practical experience with operating system. Prereq: 443 or consent of instructor. Sp-A

560 Advanced Topics in Wildlife and Fisheries Science (1-3) Recent advances and concepts, research techniques and analysis of current problems. Prereq: 443, 444, 445, or consent of instructor. May be repeated. Maximum 6 hrs. E

583 Independent Study in Wildlife and Fisheries Science (1-4) May be repeated. Maximum 8 hrs. E


Associate Professors:
Brinkman, Leonard W., Jr., Ph.D. ........ Wisconsin Harden, Carol P., Ph.D. .............. Colorado Horn, Sally P., Ph.D. .............. California Rehder, John B., Ph.D. .............. Louisiana State

Assistant Professor:
Bryan, Deborah (Visiting). Ph.D. ...... Ohio State Orvis, Kenneth H., Ph.D. ............ California

The department offers the Master of Science and Doctor of Philosophy degrees. The master's degree emphasizes development of professional competence as a geographer and offers opportunities to gain substantial depth in a concentration or a major technique. An emphasis in geographic information systems is available for students who have appropriate backgrounds in mathematics and computer science. The doctoral program is for those who have demonstrated proficiency in conducting independent research. The department is particularly well-qualified to direct graduate work in location analysis, transportation geography, urban and rural geography, cultural ecology, and the geography of the natural environment. The program is designed to give graduate students an 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, 99 hrs of 600-level seminars, and at each offering during residency 501. A minimum of 9 hrs must be earned in related fields outside the department. Competence in cartography and quantitative techniques 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; written examinations on two special fields; and an oral examination on the student's program, the special fields, and the dissertation proposal. Also required is a final oral examination on the dissertation and on other aspects of the program as determined by the student's doctoral 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.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville. The Ph.D. program in Geography is available to residents of the states of Alabama, Arkansas, Mississippi, Virginia, or West Virginia. The master's program is also available to residents of Texas. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

411 Computer Mapping and Geographic Information Systems (3) Concepts, management, and presentation of spatial data; computer hardware and software systems. Prereq: 416 and Math 171 and consent of Instructor. 3 hrs and 2 labs.

412 Advanced Cartographic Techniques (3) Cartographic design and data display techniques for reference and thematic maps. Basic principles and methods of map reproduction. Prereq: Introduction to Maps, Aerial Photography, and Cartography or consent of instructor. 3 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: 310 or consent of instructor.

415 Quantitative Methods in Geography (3) Geographic application of statistical techniques, point pattern analysis, directional analysis of areal units, Regression. Prereq: Mathematics, Introduction to Probability and Statistics, or two semesters of calculus or consent of instructor.

421 Geography of Folk Societies (3) Geographical study of folk culture, traditional material culture and rural settlement, examples from eastern North America and select international areas. Prereq: 101-02 or 320 or consent of instructor.

425 Historical Geography of the United States (3) Survey of changing human geography of United States during four centuries of settlement and development. Change of regional patterns, development of agricultural and natural resources, and periodization of life cycles. Prereq: 581 or consent of instructor.

433 The Land-Surface System (3) Characteristics of surface waters, vegetation, and surface materials, and regional interrelationships. People, environment, and land use. Prereq: Geography of the Natural Environment or consent of instructor.

434 Climatology (3) General circulation of the atmosphere leading to world patterns of precipitation. Factors controlling climate and modification, and the interaction of climate and human activity. Prereq: Geography of the Natural Environment or Meteorology or consent of instructor.

435 Biogeography (3) Distributional patterns of plants and animals on the globe. Evolution and speciation. Comparative biogeography of plant and animal groups. 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 geographic perspectives. Prereq: Consent of instructor.

French

See Romance Languages

Geography

(College of Arts and Sciences)

MAJOR

GEODEGIES

Geography ................. M.S., Ph.D.

Carol Harden, Head

Professors:
Alken, Charles S., Ph.D. ........ Georgia Bell, Thomas L., Ph.D. .......... Iowa Foresia, Ronald, Ph.D. .......... Rutgers

<table>
<thead>
<tr>
<th>Department</th>
<th>Major</th>
<th>Degree Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geography</td>
<td>GEO</td>
<td>M.S., Ph.D.</td>
</tr>
</tbody>
</table>

See Romance Languages
439 Plant Geography of North America (3) Characteristics and distribution of major plant communities of Canada, the U.S., Mexico, and Central America; relationships to climate, soil, fire, and human disturbance. Long-term history and future prospects. Prereq: Coursework in geography or botany and 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 United States. Prereq: World Geography or Economic Geography. Core Concepts or consent of instructor. Writing intensive. (Same as Urban Studies 441.)

443 Rural Geography of the United States (3) Geographical appraisal of rural areas of United States: small towns and urban fringes. Problems and potentials of rural America. Prereq: World Geography or Economic Geography. Core Concepts or consent of instructor. Writing intensive. (Same as Urban Studies 441.)

445 Geography of Resources (3) Study of factors related to variations in resource availability from time to time and place to place; energy and metallic resources. Prereq: 101-02 or 340 or consent of instructor.

449 Geography of Transportation (3) Examination of transportation systems, their effects on trade patterns, land use, location problems, and development. Prereq: 340 or consent of instructor.

450 Process Geomorphology (3) (Same as Geology 450.)

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

501 Colloquium in Geography (1) Discussion of departmental research, current research literature, and general topics. Registration required of resident graduate students whenever offered. Prereq: 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 student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

504 Research Design (3) Geographical research from selection of topic and development of research design through field work and final report.

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.

508 Directed Readings (2-8) 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.

513 Topics in Remote Sensing (3) Applied research using imagery for interpretation and mapping of geographical 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.

519 Graduate Practicum in Cartography/Remote Sensing (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.

522 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.

523 Topics in Physical Geography (3) Examination of trends, problems, and methods in geographic field work; surface system of geographical processes. Prereq: 434 or consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

524 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.

525 Topics in Biogeography (3) Examination of trends, problems, and methods in biogeography. Prereq: 435 or consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

541 Topics in Urban Geography (3) Analysis of 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.

550 Regional Geomorphology (3) (Same as Geology 550.)

577 Biological Conservation (3) Analytical treatment of problems in the conservation of natural resources. Prereq: 534 or consent of instructor. May be repeated. Maximum 6 hrs.

589 Geographic Concept and Method (3) Traditional and modern geographical thought; readings on nature, scope, problems, and methods of geography. Prereq: Consent of instructor.

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

601 Seminar in Geography (2-3) Topics vary. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

631 Seminar in Natural Hazards (3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

633 Seminar in Physical Geography (3) Prereq: 533 or consent of instructor. May be repeated. Maximum 6 hrs.

634 Seminar in Climatology (3) Prereq: 534, 532 or consent of instructor. May be repeated. Maximum 6 hrs.

635 Seminar in Biogeography (3) Prereq: 535 or consent of instructor. May be repeated. Maximum 6 hrs.

636 Seminar in Urban Geography (3) Prereq: 541 or consent of instructor. May be repeated. Maximum 6 hrs.

643 Seminar in Rural Geography (3) Prereq: 443 or consent of instructor. May be repeated. Maximum 6 hrs.

649 Seminar in Geography of Transportation (3) Prereq: 549 or consent of instructor. May be repeated. Maximum 6 hrs.

663 Seminar in Geography of the American South (3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

673 Seminar in Geography of Latin America (3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

677 Seminar in Biological Conservation (3) Conduct of original research. Prereq: 577 or consent of instructor. May be repeated. Maximum 6 hrs.

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

For admission, an applicant must provide transcripts of previous university work, two rating forms or letters of recommendation, and GRE scores (general). Students are normally admitted under non-degree status.

Prerequisites for both degrees is a Bachelor's degree, including coursework in mineralogy, petrology, stratigraphy, paleontology, structural geology, and field geology. One year each of coursework in general 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 598 during the first two years in residence. Two hours may be counted toward the 30-hour minimum. This requirement may be waived in unusual circumstances.

3. Sixteen hours of geology courses, with at least 14 hours at the 500 or 600 level, including at least one course from any three of the following five groups:

   Group 1: 410, 460, 480, 530, 563, 565.
Group 2: 420, 520, 525, 545, 546, 556.
Group 3: 470, 570, 571, 576, 577.
Group 5: Any 400- or 500-level courses with graduate credit from related departments (allied sciences, mathematics, and engineering), selected with approval of advisor.

4. Eight hours of additional graduate coursework.

THE DOCTORAL PROGRAM
The prerequisite for the Ph.D. program, in addition to the M.S. program, is either a master's degree in Geology, or a Bachelor's degree plus completion of 9 hours of coursework from the list in #3, above, including one course from each group. These courses may be taken while completing other course requirements.

Graduation requires passing a comprehensive examination, taken no later than the end of the second year, completion of all course requirements with a minimum of 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 coursework. Extra-departmental coursework is encouraged.

The student must demonstrate a reading knowledge of a foreign language in which there is a body of geological literature, as approved by the student's dissertation committee. The foreign language requirement may be waived for Ph.D. students whose native language is not English and who have demonstrated mastery of the English language, as determined by the student's dissertation committee.

GRADUATE COURSES

401 Quantitative Methods in Geology (3) Applications of calculus and differential equations to problems in earth sciences. Examples of diffusion equation in hydrogeology; wave equation in geophysics; mechanical modeling and boundary conditions in structural geology and tectonics. Prereq: The Dynamic Earth or Earth, Life, and Time, 2 semesters of Calculus.


420 Paleocology (4) Principles of ecological analysis as applied to fossils and fossil assemblages: data collection and interpretation. Laboratory designed around preparation of scientific reports based on field and laboratory analysis. Writing emphasis course. 3 hrs and 1 lab.

421 Invertebrate Paleontology (4) Survey of invertebrate animal phyla: skeletal structure and preservation, functional morphology, ecology, and stratigraphic distribution. Prereq: Palaeoecology or consent of instructor. 2 hrs and 2-2.5 hrs.

440 Field Geology (5) Summer field course for advanced undergraduate geology majors and first-year graduate students in geology. Taught off-campus and requires full time of student. Synthesis of major aspects of geological sciences in societal context. Field techniques demonstrated, practiced, and applied to solution of geologic problems. Preparation of major core courses and consent of instructor.

450 Process Geomorphology (3) Integrative approach to the development of surface of earth based upon historical processes. Map, remote sensing imagery. Prereq: 101-02. (Same as Geography 450) 2 hrs and 1-2 hr lab.

455 Basic Environmental Geology (3) Applications of geologic principles toward comprehension of effects of geologic processes on humans and effects of human activities on earth's environment. Prereq: The Dynamic Earth 2 hrs and 1-3 hr lab or field period.


470 Applied Geophysics (3) Basic principles of geophysical exploration; applications to environmental problems. Seismic and electromagnetic methods. Prereq: 8 hours of geology courses numbered above 300. 3 hrs and 1 lab.

471 Fieldwork in Geophysics (3) Geophysical investigations applied to solution of problems in tectonics, hydrogeology, or environment. Summer field course off-campus. Requires full time for 2 or more weeks. Prereq: 470 or consent of instructor.

475 Physical and Chemical Systems of the Earth (3) Development of physical earth from solid nebula to present. Formation, composition and evolution of atmosphere, crust, mantle, and core. Interdependence of earth's surface, geohazards, volcanic and tectonic phenomena. Chemical and isotopic processes of interior, and earth's temperature. Historical perspective on major processes of past, and problems unresolved today. Requires 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 emphasis on the methods of exploration. Prereq: 310 and 330 or equivalents. Recommended prereq: 460. 1 hr and 2-4 hr lab.

485 Principles of Hydrogeology (3) Physical principles of flow, flow equations, geologic controls, aquifer analysis, water well design/testing, introduction to transport processes. Prereq: The Dynamic Earth; Calculus; Fundamentals of Physics or equivalent; consent of instructor. (Same as Civil Engineering 485)

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

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

505 Structure of the Southern and Central Appalachian (2) Structural development of Southern and Central Appalachians from complex tectonic, igneous and metamorphic events that formed Appalachian area throughout the Paleozoic. Structural geology. Similar to other programs of structure. Prereq: Structural Geology 450.

510 Clay Mineralogy (3) Origin, chemistry, structures, and properties of clay minerals; application of mineralogical techniques in clay mineral studies. Prereq: 310 and 508 or equivalent. 2 hrs and 1 lab.

521 Data Analysis in Geology and Environmental Science (3) Application of statistical and computer software 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 metamorphic processes and structural history of rocks. Fieldwork and laboratory exercises emphasize thin section of rocks. 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 Appalachian. 1 hr plus field trips.

545 Sandstone Petrology/Physical Sedimentology (4) Field and microscopic analysis of fragmental clastic rock types; physical processes of sedimentation, transportation, and deposition of sedimentary structures. Prereq: 430 or equivalent. 2 hrs and 1 lab.

546 Carboate Sedimentology (4) Environments of deposition of modern and ancient carbonate sediments and diagenesis of 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 links and similarities across boundaries, unique characteristics of major divisions, provinces, sections, and districts. May be repeated with consent of instructor. Maximum 6 hrs. (Same as Geography 550).

556 Ice-Age Environments and Global Climate Change (3) (Same as Ecology and Evolutionary Biology 556.)

557 Quaternary Paleocology (3) Perturbation, processes, and patterns within Quaternary ecosystems; climatic change and vegetation relationships during last 2.5 million years. Prereq: Consent of instructor.

563 Stable Isotope Geochemistry (3) Theoretical aspects of stable isotope fractionation and applications to isotopic systems, isotopic exchange, variations in natural waters, and applications to contemporary and historical problems in sedimentary red mud 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; re-considered topics. 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.

575 Tectonics (4) Evolution of Earth's lithosphere in contemporary tectonic settings. Formation of continents through comparative anatomy of mountain belts, including Appalachian, Alps, Urals, Cordillera, Andes, and Himalayas. Prereq: Structural Geology or consent of instructor. 3 hrs and 1 lab or seminar.

576 Reflection Seismology (3) Imaging subsurface features using reflected seismic waves. Energy source, 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 groundwater, and contaminant transport methods, remediation of contaminated groundwater. Prereq: 485 or 535; 460 or 581; or Environmental Engineering 535 or equivalent; and consent of instructor.

586 Field and Laboratory Methods in Hydrogeology (3) Research methods. Measurement of hydraulic properties, drilling, sampling and instrumentation, tracer experiments. Fundamentals of hydrogeology, groundwater systems and methods of investigation. Prereq: 485 or 535; Environment Engineering 535 or equivalent; 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.
THE MASTER'S PROGRAM

The minimum requirements are 24 semester hours of course credit and six hours of Thesis. German 510 and 519-90 are required, as are three courses on German literature or culture, one of which may be at the 400 level. In addition, students must take three further courses, only one of which may be chosen from 411-12 or 485. All Graduate Teaching Assistants should take 512, and other candidates may take 512 or any other 500-level course. With the instructor's permission, M.A. candidates may take 600-level courses. A maximum of three 400-level courses may be counted toward the 24 semester hours of course credit.

THE DOCTORAL PROGRAM

The Ph.D. in Modern Foreign Languages is offered jointly by the Department of Germanic, Slavic and Asian Languages and the Department of Romance Languages and requires advanced training in a major language and either a second language or applied linguistics. Students whose language of first concentration is French or Spanish should consult the section on Romance Languages.

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 have the equivalent of an undergraduate major in one of them.

Degree Requirements

Candidates with German as a first concentration 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. The coursework must be distributed as follows:

1. First Concentration: German. A minimum of 36 hours of German courses beyond the bachelor's degree, distributed as follows:
   - 400 level: A maximum of 6 hours of 400-level classes taken for the M.A. may be applied.
   - 500 level: A minimum of 21 hours must be taken. These must include German 512, 519, 520, and 560. Thesis hours are excluded. If 512 is used as part of a second concentration in applied linguistics, another course must be substituted in the first concentration.
   - 600 level: A minimum of 12 hours must be taken, exclusive of dissertation hours.

2. Second Concentration. A minimum of 18 hours beyond the bachelor's degree, taken in the field of applied linguistics or in a second language, either French, Italian, Russian or Spanish. Twelve of these hours must be at the 500 level or above.

Students choosing applied linguistics must take German 425, 435, 510, or 512, 3 hours of Modern and German linguistics, such as 426, 436, 631, or 632, and 6 hours of linguistics electives in English or German. 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 of the first concentration but related to the student's principal area of research. Students choosing applied linguistics as a second concentration are strongly urged to take their cognate work in a second language.

4. Additional requirements: For any languages taken as a first or second concentration, a student must demonstrate competence by passing 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 M.A. Examination for Teachers and Advanced Students, or the proficiency standards of the United States Foreign Service Institute (FSI).

If a student has not chosen a third language as his or her cognate area, basic competence (determined by a reading examination with translation into English administered by the department concerned) in a third language is required. If the student's first and second languages are Romance languages, the third language should be chosen from another language family. For students choosing applied linguistics as an area of second concentration, reading competence in a second language is required.

A comprehensive examination on 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 aid (e.g., Fulbright, McClure, Rotary fellowships). For additional courses, see Romance Languages.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The Ph.D. program in Modern Foreign Languages is available to residents of the state of Alabama. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

Asian Languages

GRADUATE COURSES

431 Readings in Chinese Literature (3) Prereq: Mastery of intermediate-level Chinese or consent of instructor. May be repeated. Maximum 8 hrs.

451 Readings in Japanese Literature (3) Prereq: Mastery of intermediate-level Japanese or consent of Instructor. May be repeated. Maximum 9 hrs.
German

GRADUATE COURSES

331-32 Elements of German for Upper-Division and Graduate Students (3,3) Elements of language, elementary and advanced readings, and a final 10,000 word translation project. Open to graduate students preparing for language examinations, and upper-division students desiring reading knowledge of the language. No credit for students having completed 101-02 or 107. 332 may be repeated. Maximum 6 hrs. Undergraduate credit only.

411-12 Advanced Conversation and Composition (3,3) Prereq: 311-12 or equivalent or consent of department.

415 Special Topics (3) Topics vary. May be repeated. Maximum 6 hrs.

420 Selected Topics in German Literature from 1750 to the Present (3) Prereq: 6 hrs of 300-level courses (excluding 331-32 and courses in English translation) or equivalent.

421 German Lyric Poetry (3) Prereq: 6 hrs of 300-level courses (excluding 331-32 and courses in English translation) or equivalent.

422 German Drama (3) Prereq: 6 hrs of 300-level courses (excluding 331-32 and courses in English translation) or equivalent.

423 German Narrative Prose (3) Prereq: 6 hrs of 300-level courses (excluding 331-32 and courses in English translation) or equivalent.

424 German Literary Movements (3) Survey of major periods in development of German literature since 1750. Problems and periods can be specified.

425 Introduction to Descriptive Linguistics (3) (Same as French 425, Spanish 425, Linguistics 425, and Russian 425.)

426 Methods of Historical Linguistics (3) Phonetics, distinctive feature analysis, sound change types, nature of sound change, principles of reconstruction, and fundamental assumptions about language change through time. Survey of non-phonological linguistic change, language families, Proto-Indo-European, and other proto languages. Prereq: 6 hrs of upper division foreign language courses (excluding courses in translation or graduate reading courses). (Same as Russian 426, French 426, Spanish 426, and Linguistics 426.)

435 Structure of the German Language (3) Contrastive English-German segmental and suprasegmental phenomena, contrastive English-German linguistic structures, selected topics in advanced German grammar and syntax 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.)

465 Business German (3) Survey of German used in fields of business, government, administration, and economics. Prereq: 6 hrs of upper-division German excluding courses in translation and graduate reading courses.

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

502 Registration for Use of Facilities (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 30-semester hour degree requirements. May be repeated. S/NC only. E

510 German Phonetics and Advanced Grammar (3) Advanced work in phonetics, pronunciation, and selected topics in German grammar. For teachers and prospective teachers. Prereq: Consent of instructor.

512 Teaching a Foreign Language (3) Practical application of methods for teaching and evaluating basic language skills and foreign language skills, and cultural knowledge through seminars, demonstrations, peer-teaching, and observation of foreign language classes. Required of all M.A. and Ph.D. students holding GTAs, except those whose previous training or experience warrants excuse by department.

519 Bibliographical Methods (1) Bibliographical methods, major reference works and bibliographical problems in language and literature.

520 Proseminar (2) Advanced training in use of bibliographical and reference tools; illustrative problems; paper preparation.

541 Medieval German Language and Literature (3) Introduction to Middle High German.

550 Studies in German Literature (3) Content varies. May be repeated. Maximum 6 hrs.

552 German Enlightenment, Rocco, 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 Language 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)

561-52 Directed Readings in German Language and Literature (3,3)

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

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

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)

Russian

GRADUATE COURSES

401-02 Advanced Grammar, Conversation, and Composition (3,3) Prereq: Russian Composition and Conversation or equivalent. (Same as Russian and East European Studies 401-02.)

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 Linguistics 426.)

430 Selected Topics in Russian Literature (3) Content varies. May be repeated. Maximum 9 hrs.

451-52 Senior Seminar (3,3) For majors in Russian; minors admitted at discretion of instructor. Intensive study of language, literary style, and literary criticism based on selected major novels. (Same as Russian and East European Studies 451.)

510 Russian Phonetics and Advanced Grammar (3) Phonetics, pronunciation, stylistics, and selected topics in Russian grammar. For teachers and prospective teachers. Prereq: Consent of instructor.

550 Studies in Russian Literature (3) Content varies. May be repeated. Maximum 9 hrs.

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

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

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

Health and Safety Sciences

Health and Safety Sciences

(College of Human Ecology)

MAJORS

DEGREES

Health Promotion and Health Education .................................. M.S.

Public Health ......................................................... M.P.H., M.S.-M.P.H.

Safely Education and Service ........................................... M.S.

Charles B. Hamilton, Head

Professors:

Gorski, June, Dr. P.H. .............................................. UCLA

Hamilton, Charles B. (Liaison). Dr. P.H. ....................... Oklahoma

Kirk, Robert H., H.S.D. ............................................ Indiana

Wallace, Bill C. (Liaison), Ed.D. ............................... Northern Colorado

Associate Professors:

Pursley, R. Jack, Ph.D. ........................................... Iowa

Zemel, Paula, Ph.D. .................................................. Wayne State

Assistant Professors:

Ellison, Jack S. (Liaison), Ed.D. ................................. Tennessee

Fitzhugh, Eugene C., Ph.D. ................................. Alabama

Smith, Susan M. (Liaison), Ed.D. .............................. Tennessee

The Health and Safety Sciences Department offers graduate programs leading to the Master of Science with majors in Health Promotion and Health Education; and Safety Education and Service; and 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.

The department is committed to the educational value of community-based experiential learning.

Health

A graduate program is available leading to the Master of Science with a major in Health Promotion and Health Education (thesis and non-thesis options), requiring completion of 30 semester hours.

The Doctor of Philosophy with a major in Human Ecology offers a concentration in community health.

THE PH.D. CONCENTRATION

The community health concentration integrates the behavioral and natural sciences with public health, community health education, health promotion and the safety sciences to
prepare scholars with an interest in improving the health of the nation. 

Requirements include:
1. Minimum 21 hours of foundation courses: 610, 620, 6, 4 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.

GRADUATE COURSES

400 Consumer Health (3) Survey of major consumer health care providers and health care services; selecting, purchasing, evaluating and financing medical and health care services/products. (Same as Public Health 400.) Sp

405 Alcoholism and Alcohol Education (3) Problems of alcoholism. Factors which make alcoholism serious. Health and safety problem. Various types of institutional. (Same as Women's Studies 405.) F

406 Death, Dying and Bereavement (3) Aspects of dying, death and handling of trauma of loss. Medical, familial, physical, legal and social implications of death. F, Sp

420 Sex Education As It Relates to Human Sexuality (3) Exploration of science of human sexuality. Trends, issues, and content of sex education. E

423 Women's Health (3) Factors influencing women's health and the care that women receive in the health care delivery system. Health problems/perspectives of women and men for prevention, maintenance and/or correction. (Same as Women's Studies 423.) E

430 Suicide and Crisis Intervention (3) Factors which make suicide serious health problem. Assessment, intervention, and prevention techniques. Sp


465 Aging and Health (3) Aging process in health perspective as related to health promotion and wellness of aged. F, Sp

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

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

520 Sex Education and Human Sexuality (3) Advanced in-depth discussion of educational and health counseling theory, techniques, materials used in school, community, or health care facility. Sp

530 Health Promotion and Health Education Program Development (3) Theories and principles of health promotion program development; methodology, marketing, public relations. Health education as vehicle for health promotion. F

540 Evaluation in Health Promotion and Health Education (3) Evaluation principles and methodologies as related to health promotion products, processes and programs. Construction of instruments for use in assessing health education outcomes. Sp

570 Special Topics (1-3) For graduate students, in-service teachers and other health professionals. Health wellness or health promotion issues. May be repeated. Maximum 12 hrs. F

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.) F

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. E

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

601 Internship in Health Education (3-6) (Same as Public Health 601.) F

610 Critical Analysis of Writing and Research (3) Analysis of writing in health related areas. F

620 Advanced Research Techniques in Health (3) Advanced theory and techniques of research design and methodologies in health discipline. Prereq: 590, 610. Sp

550 Health Aspects of Gerontology (3) Knowledge and understanding of biologic, psychological and sociological aspects of aging as related to health and wellness of individual. (Same as Public Health 650.) Su

555 Seminar in Health (3) Comprehensive study of definition, determinants, resources and health status of nation. (Same as Public Health 655.) F

680 International Health (3) Study of quality of health, health promotion and health services in countries throughout world. (Same as Public Health 660.) Sp

880 Seminar in Health (1) Ramifications of health and health education innovations in relation to evolving field and discipline. Prereq: Advanced standing as doctoral candidate. May be repeated. Maximum 3 hrs. F, Sp

Public Health

Graduate study with a major in Public Health leads to the Master of Public Health (M.P.H.). Three professional preparation concentrations are available: community health education, gerontology, and health planning/administration. The M.P.H. program is accredited by the Council on Education for Public Health. A minor in statistics is available to interested M.P.H. students due to public health affiliation with the Intercollegiate Graduate Statistics Programs.

ADMISSION REQUIREMENTS

A statement of the applicant's educational and career goals and three rating forms are required. Request application packet from the department. Preferential consideration for admission to degree status shall be given to those with a minimum undergraduate grade-point average of 2.8 and with at least one year of professional experience in a health-related occupation. As a restricted program, non-degree admission requires department recommendation. Deadlines for completed applications are 1 February for Summer term and 1 April for Fall semester.

THE MASTER'S PROGRAM

The M.P.H. is a non-thesis program requiring completion of 38 semester hours of coursework including 9 weeks of field practice. The field internship provides a full-time experience with an affiliated health agency in one or more areas of health programs. Of importance to this experience allows the student to apply academic theories, concepts, and skills in an actual work setting. Students must complete all assigned prerequisite courses and a minimum of 38 semester hours of the curriculum with a minimum overall GPA of 3.0 prior to graduation. As an alternative to field practice, preparation of a master's essay may be used to fulfill the professional skills development component of the curriculum. Approval must be received from the Public Health Academic Program Committee and is contingent on consent of major advisor, formal written proposal by the student, and completion of an additional research methods course. Written guidelines stipulating expectations and eligibility criteria are available.

Requirements include:
1. Public Health Foundation courses (16 hours): 509, 510, 520, 530, 540, 555.
2. Internship (6 hours): 587, 588.
3. Concentration of Study (16 hours). Required and recommended electives will be selected by the student in consultation with the major advisor. A list of courses is available for each concentration: community health education, gerontology, and health planning/administration.

DUAL M.S.-M.P.H. PROGRAM

The College of Human Ecology offers a coordinated dual program leading to the conferment of both the Master of Science with a specialization 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 health 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.

Culmrin

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 the M.S. and M.P.H. degrees. 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 Nutrition and Public Health Sciences will award a maximum of 11 semester hours of credit toward the M.P.H. degree for successful completion of approved courses offered in the Department of Nutrition. All courses for which such cross-credit is awarded must be approved
by the Public Health Academic program Committee and the student's graduate committee. A single block field experience (or public health internship) is required of all students and the analytical field paper incorporates public health nutrition and the student's public health concentration.

Dual degree students who withdraw from the program before completion of the requirements for both degrees will not receive credit towards the M.S. or M.P.H. degree for courses taken in the other program, except as such courses qualify for credit without regard to the dual program.

Approved Dual Credit
M.S. courses to be counted toward the M.P.H. program must include 10 semester hours of Field Study in Community Nutrition (NTR 515) and 1 semester hour of Graduate Seminar in Public Health (NTR 509). M.P.H. courses to be counted toward the M.S. include Public Health Administration (PH 520), Biostatistics (PH 530), and Epidemiology (PH 540).

MINOR IN GERONTOLOGY
Graduate students in Public Health may pursue a specialized minor in gerontology. This interdisciplinary minor gives the student an opportunity for combining the knowledge about aging in American society with their major concentration. Please refer to Human Ecology for specific requirements.

ACADEMIC COMMON MARKET
An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The M.P.H. program in Public Health is available to residents of the states of Arkansas or Kentucky. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

COURSE REGISTRATION
Non-degree students must obtain permission from the department head to register for 500-level public health courses. Prerequisite coursework and approval for admittance to the M.P.H. program must be completed promptly, with a grade of B or better, typically within the first semester or two of enrollment in graduate studies.

GRADUATE COURSES
400 Consumer Health (3) (Same as Health 400)
410 Health in the Work Environment (3) Fundamental activities in field of industrial health aimed at reducing health problems for employees. Workplace health hazards and problems of concern to nurses, medical staff, management, engineers and others in industrial health and safety fields. Prereq: Consent of instructor. May not be taken for credit by occupational health concentration majors. Sp
493 Directed Independent Study (1-3) Individual in-depth study of selected issues. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty member before degree is completed. May not be used toward degree requirements. May be repeated. S/N only. E
509 Graduate Seminar in Public Health (1) In-depth discussion of timely topics reflecting scope of public health as discipline and related to interaction with many other academic and professional disciplines. Speakers both internal and external. May be repeated. Maximum 4 hrs. Prereq: Same as Nutrition 509, Exercise Science 509 and Social Work 509 (S/N only). F, Sp
510 Environmental and Occupational Health (3) Complexities of personal and ambient environment recognizing health as individuals' response to diverse and dynamic world. Principles of, and International safety and health surveillance of contemporary issues and their implications for healthful living today and in future. F, Sp
520 Public Health Policy and Administration (3) Administrative and regulatory aspects of community-based health care programs and public health practice. Health policy formulation, political environment and governmental involvement in health, legal responsibilities, and management concepts/techniques/ processes. F, Sp
521 Organization Theory and Health Care Delivery (3) Administrative and organization theory related to health facilities; operation and management of community hospitals. Case discussions and problem-solving exercises; organizational and functional analysis. F, Sp
523 Management in Extended Care Settings (3) Managerial concepts and theoretical foundations essential to supervision and administration of domiciliary health services programs. Management and operation of health services programs for patients and clients in settings which provide activities of daily living and special psychosocial environmental needs. Programs for home health care, comprehensive medical rehabilitation, nursing homes, congregate living centers and similar type health programs. Prereq: 521 or consent of instructor. Sp
525 Financial Management of Health Programs (3) Financial management concepts and practices applied to health services programs. Fundamentals of budgeting, costing, financing, rate setting, financial reporting and control. Opportunities to apply techniques. Prereq: 520 or consent of instructor. Sp
530 Biostatistics (3) Application of descriptive and inferential statistical methods to health-related problems and programs. Microcomputer applications, use and interpretation of vital statistics and introductory research methodology preparatory coursework in epidemiology. Prereq: Introductory statistics or consent of instructor. E
540 Principles of Epidemiology (3) Distribution and determinants of health-related outcomes in specified populations, with application to control of health problems. Historical origins of epidemiologic research design, error sources, measures of frequency and association, etiologic reasoning, statistical analysis, and cause. Prereq or coreq: 520. F, Sp
542 Advanced Epidemiologic Methods (3) Nature, collection, analysis and interpretation of data pertaining to cohort and case-control studies. Survival analysis and survival analysis. Experience in critiquing, conceptualizing, and analyzing factors. Prereq: 540 or consent of instructor. Sp
550 Principles and Practices of Community Health Education (3) Theoretical foundations for community health education and public health education. Application of educational processes and instruction in community health education and public health education. F
552 Community Health Problem Solving (4) Dynamics of community organization, community needs assessment, educational interventions, and application of problem-solving techniques. Prereq or coreq: 550. F, Sp
560 Theories and Techniques in Health Planning (4) Overview of health planning concepts and methodologies; systems-oriented planning process. Major elements of planning: formulation and conceptualization of problem, plan design, evaluation and implementation. Health problems of institutions, communities and selected population groups, appropriate diagnoses, and programs for addressing needs. Sp
568 Physical Activity and Positive Health (3) (Same as Exercise Science 568)
569 Fitness Testing, Programming, and Leadership for Diverse Populations (3) (Same as Exercise Science 569)
580 Special Topics (3) Prereq: Consent of instructor. May be repeated under different topic. Maximum 6 hrs.
585 Seminar in Gerontology (1) (Same as Human Ecology 585, Counseling Education and Counseling Psychology 585, Exercise Science 585, Nursing 585, Psychological and Educational Studies 585, Social Work 585, and 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. 589 available only for approved extended placements. S/N only. E
590 Research Methods in Health (3) (Same as Health 590) F
593 Directed Independent Study (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E
650 Health Aspects of Gerontology (3) (Same as Health 650) Su
655 Seminar in Nation's Health (3) (Same as Health 655) F
660 International Health (3) (Same as Health 660) Sp

Safety
Graduate study with a major in Safety Education and Service (thesis and non-thesis options) leads to the Master of Science degree. The M.S. requires completion of 30 semester hours. Students may elect an internship experience with private industry or nonprofit organizations. Curricular experiences will assist graduate in preparation for certified safety professional examination.

The graduate program contributes to the University of Tennessee's mission of nursing health protection by preparing safety professionals with the knowledge and skills necessary to create and maintain safer human environments in the workplace (industrial and commercial), home, school, and community. The offering of all core classes on an evening class schedule enables those working full-time in a safety-related field to pursue the M.S. degree with a major in Safety Education and Service on a part-time basis.

ACADEMIC COMMON MARKET
An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The M.S. program in Public Health Education and Service is available to residents of the states of Alabama, Arkansas, or Florida. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES
443 Sports & Recreational Safety (3) Accident prevention and injury control in sports activities; philosophy of sports safety; human environmental factors and interrela-
tionship in sports injury and control; risk-taking and decision solution strategies; and contributions of sports medicine to safety. 3 hrs and 2 labs. Sp

452 General Safety (3) Principles, practices, and procedures in general safety. Safety problems in school, traffic, recreation, industry, home and other public areas. F, Su

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

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

532 Behavioral Problems in Safety Education & Accident Prevention (3) Problems of behavior, causes of accidents, and application of principles of psychology in development of safe behavior in all segments of environment. F

533 Problems and Research in Accident Prevention (3) Safety problems found in wide variety of accidents that occur in community; findings of current research in behavioral sciences as related to variation incidence of accidents. F

534 Organization, Administration and Supervision of Safety Programs (3) National and state level programs; administrative, instructional, and supervisory aspects. Implementation of relevant programs. Sp

535 Emergency Management (3) Civil and defense problems; hurricanes, floods, fires, mass civil disorders, and nuclear and personnel attack by alien countries. Sp

572 Graduate Workshop in Safety (3) Special safety education programs. For advanced graduate students, teachers, supervisors, and administrators. May be repeated. Maximum 12 hrs.

590 Special Topics (1-3) Advanced study in selected disciplinary or professional area of safety education management. May be repeated. Maximum 12 hrs.

593 Directed Independent Study (1-3) Individual identification and study of problem or issue in safety. Extensive reading and critical analysis of safety literature. Specific proposal to instructor before registration. May be repeated. Maximum 12 hrs. E

601 Internship/Research in Safety and Health (3-6) Field experience. Significant problem identified, researched, and reported in acceptable form. May be repeated. Maximum 6 hrs. (Same as Health 601.) E

History
(College of Arts and Sciences)

MAJOR

DEGREES

History .................................. M.A., Ph.D.

John R. Finger, Acting Head

Professors:
Bergeron, Paul H., Ph.D. ............ Vanderbilt
Chmielewski, Edward V. (Emeritus), Ph.D. ............ Harvard
Cutler, E. Wayne, Ph.D. ............ Texas
Farris, W. Wayne, Ph.D. ............ Harvard
Finger, John R., Ph.D. ............ Washington
Hass, Arthur G., Ph.D. ............ Chicago
Hao, Yen-Ping (Lindsay Young Prof.), Ph.D. ............ Harvard
Haskins, Ralph W. (Emeritus), Ph.D. ............ California
Klein, Milton M. (Emeritus) (Distinguished Prof.), Ph.D. ............ Columbia
Moser, Harold, Ph.D. ............ Wisconsin
Ratner, Lorman A., Ph.D. ............ Cornell
Utley, Jonathan G. (Emeritus), Ph.D. ............ Illinois
Wheeler, W. Bruce, Ph.D. ............ Virginia

Associate Professors:
Becker, Susan D., Ph.D. ............ Case Western
Bing, J. Daniel, Ph.D. ............ Indiana
Bohstedt, John, Ph.D. ............ Wisconsin
Brummett, Palmira R. (Liaison), Ph.D. ............ Chicago
Diacson, Todd A., Ph.D. ............ Michigan
Johnson, Charles W., Ph.D. ............ Yale
Pickney, Paul J., Ph.D. ............ Vanderbilt

Assistant Professors:
Ash, Stephen V., Ph.D. ............ Tennessee
Bast, Robert J., Ph.D. ............ Arizona
Bradley, Owen P., Ph.D. ............ Cornell
Burman, Thomas E., Ph.D. ............ Harvard
Glover, Lorn, Ph.D. ............ Kentucky
Haiken, Elizabeth, Ph.D. ............ California
Higgs, Catherine A., Ph.D. ............ Yale
Lieblevius, Vejas G., Ph.D. ............ Pennsylvania

The Department of History offers graduate study leading to the Master of Arts and Doctor of Philosophy degrees. The M.A. program includes a thesis and non-thesis option. The doctoral program has concentrations in American and European history with special focus in the areas identified under Group II doctoral 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 the M.A. degree from an accredited institution, preferably with a major in history.
2. Acceptable scores on the Graduate Record Examination (general).

General Requirements
1. Complete History 510 at UT Knoxville.
2. Complete a minimum 6 related hours outside the department.
3. Maintain a 3.0 overall grade-point average.
4. Complete 9 hours in each of two Group I doctoral fields. (The courses in the non-examined field must be graded A-F. There is no minimum hours requirement for a Group II field. Courses taken to fulfill M.A. requirements may be counted toward this requirement.)
5. Fulfill the foreign language requirement.
6. Complete two 600-level research seminars. (One must be completed at UT Knoxville.) Students who have completed a master's thesis need complete only one research seminar (must be taken at UT Knoxville) and History 621.
7. Maintain a 3.0 overall grade-point average in graduate work attempted.
8. Complete 21 hours of graduate coursework graded A-F at UT Knoxville beyond that required for the M.A.
9. Except by prior approval of the Director of Graduate Studies, a student's coursework must be at the 500 level or above.

Language Requirements
Students must demonstrate competence in one foreign language through coursework or examination. The student's doctoral committee may specify any other languages or research tools, such as statistics, essential for the student's preparation. The foreign language requirement must be fulfilled before taking the comprehensive examination.

Comprehensive Examination
The comprehensive examination is to be taken no later than the semester following the term in which the student has completed the residence, coursework, and language requirements. A student stands examination in one field selected from Group I and one field selected from Group II below. Both parts are 4-hours, written, and taken during the same semester. A general oral exam will be taken following the successful completion of the two written portions. The two written and one oral exams are separate examinations, and Group I must be passed before taking Group II, and the latter passed prior to taking the oral portion. A
student who fails any one of the three parts (Group I or Group II or the Oral) which constitute the Comprehensive Exam must repeat the failed exam within two semesters, excluding summer. A second failure on any one of the three parts (regardless of which one) will cause the student to be dropped from the History graduate program. Likewise, a student who does not repeat a failed exam within the allotted time (two semesters) will be dropped from the program. Upon successful completion of the residence, coursework, and language requirements and passing the comprehensive examination, a doctoral student may be admitted to candidacy.

**Doctoral Fields**

Group I:
- Premodern Europe
- Modern Europe
- United States (colonial to present)
- East Asia
- World History

Group II:
- To be defined by the student’s doctoral committee from within one of the following fields:
  - United States
  - Colonial and Early Republic
  - 19th century
  - 20th century
  - Regional
  - Military and Foreign Relations
  - Social and Cultural
  - American Political
  - European
  - Medieval
  - Early Modern
  - Modern
  - Political and Diplomatic
  - Intellectual and Cultural
  - Social and Economic
  - National Fields

**Dissertation and Defense**

Original research forms the basis for the dissertation. Doctoral candidates must register for a minimum of 3 hours of 500 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**

415 Western Economic Thought Since the 18th Century (3) Methods of study of doctrinal history. Origins and evolution of major doctrines: classical and neoclassical economics, economic thought of Keynes and his followers, principal developments of second half of 20th century. Major writing requirement. May not be used toward graduate degree in History. Prereq: Introductory Economics or consent of instructor. (Same as Economics 415.)

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

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

510 Foundations of Graduate Study in History (3) Assumptions and methods of historians. Required of all candidates for advanced degrees. F

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 19th-century United States. Focus varies. May be repeated. Maximum 15 hrs.

541 Topics in Early American History (3) Reading seminar: secondary sources on early American history. Focus varies. May be repeated. Maximum 15 hrs.

542 Topics in 18th-Century United States (3) Reading seminar: secondary sources on 18th-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.

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. Focus varies. May be repeated. Maximum 15 hrs.

555 Topics in United States Social and Economic History (3) Reading seminar: secondary sources on U.S. economic and social 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 or cities. 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. 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 15 hrs.

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

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

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

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

621 Directed Readings (3) Directed readings to prepare candidate for doctoral comprehensive examination. May be repeated. Maximum 1 per doctoral field. S/NC only. E

632 Seminar in Modern European History (3) Research seminar in primary sources culminating in scholarly paper in 20th-century European history. Focus varies. May be repeated. Maximum 15 hrs.


**Holistic Teaching/Learning**

(College of Education)

**MAJORS**

**DEGREES**

Education ......................... M.S., Ed.D., Ph.D.

L. Knight, Leader

Professors:
- Alexander, J. Estill (Emeritus), Ed.D. ....... Kentucky
- Davis, A. R., Ph.D. ....................... Ohio State
- Harris, G. A., Jr., Ph.D. ................... Michigan
- Huff, P. (Emeritus), Ph.D. ................. Ohio State
- Jost, Karl J., Ed.D. .......................... Oklahoma
- Knight, Lester N., Ph.D. ................... Texas
- Rowell, C. Glennon, Ed.D. ................. Kent State
- Turner, T. N., Ed.D. ...................... Penn State

Assistant Professors:
- Gilrane, Colleen P., Ph.D. .................... Illinois
- Schindler, W. Jean, Ph.D. ................. George Peabody
- Knight, L., Ed.D. ............................. Northern Colorado
- Gilrane, Colleen P., Ph.D. ................. Illinois
- Hendrick, D. A., Ph.D. ..................... Alabama

Instructor:
- Butterworth, Jennifer R., Ph.D. .......... Vanderbilt

The Holistic Teaching/Learning unit participates in graduate programs leading to degrees, majors, and concentrations in:

- Master of Science
- Education
- Track 1-elementary education
- Track 1-modified and comprehensive special education
- Track 1-reading education
- Track 1-social sciences education
- Track 2-elementary teaching
- Track 2-modified and comprehensive special education
- Track 2-secondary teaching

**Education Specialist**

**Education**

Elementary education
Reading education
Social science education
419 Psychology and Education of Students with Mild Disabilities (3) Nature and characteristics of persons with mild handicaps and educational strategies appropriate for these persons. Prereq: Special Education Principles, Special Education Strategies, Admission to Teacher Education Program. Coreq: 420. F

420 Field Experience in Modified Programs (3) Practicum training in modified programs: planning, developing, implementing and evaluating instruction. Prereq: Special Education Principles and Special Education Strategies, Admission to Teacher Education and Curriculum and Instruction 422. Coreq: 420. SNC only. F

421 Elementary and Middle School Science and Social Studies Instruction (3) Methods and materials for teaching science and social studies. Development of functional relations of object fields to activities. Prereq: Open to students with recent course or background in teaching science and/or social studies. Prereq: Admission to teacher education program. F,Sp

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 program. F,Sp

430 Elementary and Middle School Developmental Reading Instruction (3) Word recognition (including phonics), comprehension, evaluation, and materials. Prereq: Open to students with recent course in reading education. Prereq: Admission to teacher education program. F,Sp

431 Field Experience in Comprehensive Programs (3) Prereq: Special Education Principles and Special Education Strategies. Admission to Teacher Education and Curriculum and Instruction 422. Coreq: 430. SNC only.

432 Psychology and Education of Students with Moderate/Severe Disabilities (6) Nature and characteristics of persons with severe disabilities and educational strategies appropriate for these persons. Prereq: Special Education Principles and Special Education Strategies. Admission to Teacher Education and Curriculum and Instruction 422. F

434 Topics in Reading Education (1-6) Prereq: Admission to teacher education and course in reading education. May be repeated. Maximum 6 hrs. E

457 Teaching Strategies and Issues in Social Studies Education (3) Goals, objectives, techniques, materials, and evaluation; directed observation in public schools, preparation of teaching plans and materials; simulated teaching experiences. Prereq: Admission to Teacher Education Program.

458 Speech and Language Basis of Learning Disabilities in the Classroom (3) Normal communication development; understanding of speech and language impairments in school-age students; integration of oral/written communication skills into existing curricula, especially for high-functioning 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 individual; opportunity to expand study upon particular exceptionality. Enrollment limited to non-special education majors.

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

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

503 Problems in Lieu of Thesis (2-3) May be repeated. Maximum 9 hrs. SNC only. E

504 Studies and Theory in Language Development (3) Studies and theory of language development in children. Prereq: Elementary School language arts course or consent of instructor. F

505 Elementary and Middle School Teaching Methods II (6) 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. F

506 Internships in Teaching in Special Education and Rehabilitation (3) Practicum experiences in professional settings in public schools or agencies under supervision of master practitioners. Enrollment limited to those in fifth-year program. SNC only.

518 Educational Specialist Research and Thesis (3) May be repeated. P/NP only. E

521 Teaching Social Studies in Elementary and Middle Schools (3) Planning and techniques for teaching social studies. Examination, development of concepts and generalizations; integration of social sciences. Prereq: Course in teaching of social studies or consent of instructor. Sp

523 Diagnosis and Correction of Children's Difficulties in Learning Mathematics (3) Children's difficulties in learning mathematics and procedures for helping classroom teacher correct difficulties. Prereq: 522 or equivalent or consent of instructor. Sp


525 Strategies, Programs and Materials for Teaching Elementary Social Studies (3) Analysis of new and innovative social studies program materials and techniques. Exploration of current trends in social studies education. Prereq: Previous course in teaching of social studies or consent of instructor. Sp

527 Elementary School Curriculum (3) Examination, evaluation and application of curriculum design in elementary school; trends and issues which affect elementary education. Prereq: Consent of instructor. F, Su

528 Teaching Language Arts Elementary and Middle School (3) Trends and current methods and materials in teaching elementary language arts (except reading). Prereq: Course in language arts methods or consent of instructor. Sp, Su

529 Practicum in Diagnosis and Remediation of Difficulties in Learning Mathematics (3) Assessment and planning experiences with children having difficulties in learning elementary school mathematics. Prereq: 523 or consent of instructor. Su

530 Teaching Reading in Elementary and Middle Schools (3) Trends in methods, materials, basic approaches, skill development and assessment procedures for teaching reading at elementary school level. Prereq: Course in teaching of reading or consent of instructor. F, Su

534 Seminar in Reading Education (1-6) May be repeated. Maximum 6 hrs. F, Sp

535 Psychology of Reading (3) Reading, teaching, behavior change and learning in the classroom. Prereq: Consent of instructor. F

537 Diagnosis and Correction of Classroom Reading Problems (3) Procedures, methodologies and materials for diagnosing and correcting classroom reading problems. Prereq: Consent of instructor. Sp

538 Practicum in Diagnosis of Reading Problems (3) Theoretical and practical applications of specific reading diagnostic instruments; testing of elementary and/or secondary school students, preparing case study reports, conducting parent conferences. Prereq: Course in diagnosis and correction of classroom reading problems or consent of instructor. Sp

539 Practicum in Remediation of Reading Problems (3) Application of learning strategies methodology in working with elementary and/or secondary school students on one-to-one or small group basis. Prereq: Course in diagnosis and correction of reading problems or consent of instructor. Sp

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. Su

553 Assessment of Exceptional Students (3) Current issues related to assessment; advanced study of evaluation models for special education; dynamic and other innovative assessment techniques; advanced study of application to educational programming, special education curriculum and assessment in application.

554 Developmental Reading Practicum (3) Diagnosing and teaching reading having developmental and corrective needs. Prereq: Course in diagnosis and correction of reading problems or consent of instructor. May be repeated. Maximum 4 hrs. Su


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 equipment. Theoretical aspects of affective/motivational education and components of learning styles, group interactions. Prereq or coreq: 555 or consent of instructor. F

557 Positive Preventive Discipline (3) Instructional, classroom and preventive/practitioner strategies for use in classroom which positively affects behavior of classroom. Research on how curriculum can encourage appropriate behavior in children. Prereq: Admission to graduate program. F

579 Special Topics (1-3) Prereq: Admission to graduate program. May be repeated. Maximum 9 hrs. SNC or letter grade.

585 Teaching Secondary School Social Studies (3) Strategies, projects, materials, and programs in social studies. Prereq: Undergraduate course in teaching of social studies. F, Su

586 Seminar in Research Techniques in Special Education (3) Evaluation of research methodologies and techniques. Prereq: Consent of instructor. F

587 Seminar: Issues and Theories in the Education of the Exceptional Child (3) Theories of understanding of the exceptional child. Prereq: Consent of instructor. F

590 Application of Microcomputer Technology in Special Education and Vocational Rehabilitation (3) An in-depth study of a microcomputer technology with all categories of exceptionalities and across all chronological and
orea of Science that administers the Ph.D. concentration in human ecology. The concentration in human ecology is designed to integrate experiences from different sources and to demonstrate the multi-faceted nature of working within an aging society.

**Declaration of a Minor**

Prior to earning more than one-half the total hours required for this minor, students must complete a "Declaration of a Minor in the College of Human Ecology" form. Copies of this form are available in the Dean's Office, Room 110, Jessie Harris Building.

**Core Experience**

Students must complete a core experience of 12 semester hours taken from at least three different departments including nine hours taken from outside the major department. Coursework needs to comply with the following framework:

1. Coursework: 9 hours required. A variety of coursework may be taken toward satisfaction of this requirement. Courses which are offered on a regular basis include: Health 406, 465, 650, and Nutrition 518, Public Health 523, Retail and Consumer Studies 560, Social Work 568, Sociology 415, Psycheducational Studies 504, 522, 525, 528.
2. Applied practicum: 2 hours required. Students should register under practicum experiences in the "home" department of the supervising faculty.
3. Human Ecology 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. Contact Dr. Jim Moran, Associate Dean in Human Ecology, for current list.

**Admission to Candidacy**

Admission to candidacy indicates the minor must be noted on the Admission to Candidacy form.

**ACADEMIC COMMON MARKET**

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The Ph.D. program in Human Ecology is available to residents of Alabama, Kentucky, Mississippi, Virginia (concentration in health education only), or West Virginia. Additional information may be obtained from the Graduate Admissions Specialist in the Office of Graduate Admissions and Records.

**GRADUATE COURSES**

500 Thesis (1-15) P/NP only. E
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N/C only. E
510 Integrative Nature of Home Economics (3) History and philosophy of home economics. Analysis of current programs and future directions in field. Examination of research, integrative framework. F.A
520 Directed Study in Human Ecology (1-3) Integrative topics. Prereq: At least 9 hrs of graduate study in college.
Human Resource Development

College of Human Ecology

MAJORS

Human Ecology

Human Resource Development

DEGREES

Ph.D.

M.S.

Gregory C. Petty, Head

Professors:

Campbell, Clifton P., Ed.D. ..... Maryland

Cheek, Gerald D. (Emeritus). Ph.D. ..... Kansas State

Coakley, Carroll B. (Emeritus). Ph.D. ..... Wisconsin

Craig, David G. (Emeritus). Ed.D. ..... Cornell

DeJonge, Jacqueline O., Ph.D. ..... Iowa State

Haskell, Roger W. (Emeritus). Ph.D. ..... Purdue

Petty, Gregory C., Ph.D. ..... Missouri

Wagoner, George A. (Emeritus). M.S. ..... Indiana

Associate Professors:

Breuer, Ernest W. (Liaison), Ph.D. ..... Tennessee

Dean, Peter J., II, Ph.D. ..... Iowa

Hanson, Robert, Ph.D. ..... Purdue

McNinis, Jacquelyn H., Ph.D. ..... Florida State

Assistant Professors:

Stout, Vickie J., Ed.D. ..... Tennessee

Mimbs, Cheryl A., Ph.D. ..... Virginia Tech

Pierce, Randal, Ph.D. ..... Ohio State

THE MASTER'S PROGRAM

The Master of Science degree with a major in Human Resource Development provides a flexible graduate program for professionals wishing to pursue in-depth study within and across subject areas of Human Resource Development; those who work with individuals to help them enter the workforce; those who train individuals already in the workforce; and those who help individuals in the workforce advance their potential.

The M.S. degree with a major in Human Resource Development offers two concentrations, each providing opportunities for specialized interests. The training and development concentration is designed to meet the needs of professionals who work in programs encompassing all areas of human resource development. Applicants without an undergraduate degree in an area related to human resource development may be required to take 501 as a prerequisite and to complete an internship as part of their program. The teacher licensure concentration is specifically for students who seek initial teacher licensure in family and consumer sciences education, business and marketing education, and technology education. This program requires admission to Teacher Education and has specific prerequisites. Thesis and non-thesis options are available for both tracks.

Admission Requirements

Training and Development Concentration - Applicants are to submit an application for admission to The Graduate School, three letters of reference from individuals familiar with their potential for success in academic work, and a statement describing personal career objectives directly to the Department of Human Resource Development. Applicants must present a GPA of at least 3.0 on a 4.0 scale for the last two years of undergraduate work. Any student below this level of academic quality must justify admission via other exceptional credentials. If the applicant has prior work experience in human resource development, a reference letter should also be provided by the work supervisor. Recent Graduate Record Examination or Miller's Analogies Test scores are required of all applicants except for those applying for the teacher licensure concentration. Students who have not taken an appropriate undergraduate statistics course will be required to take one as part of their graduate program. All applicants are required to be interviewed by the department admissions board.

Teacher Licensure Concentration - Applicants are to submit an application for admission to The Graduate School and are to be admitted to the Teacher Education Program in order to progress in the Professional Education coursework. Admission to the teacher licensure program requires a minimum 2.5 GPA for Technology Education, Business and Marketing Education, Family and Consumer Sciences Education. In addition, applicants are to have a satisfactory student conduct record; a satisfactory speech and hearing evaluation; passing scores on the Pre-Professional Skills Test or an ACT composite score of 21 or an Enhanced ACT composite score of 22 or a SAT combined score of 990; and a satisfactory Admissions Board interview.

Degree Requirements

Training and Development Concentration - The 36-hour thesis option (33 hours if statistics is waived) includes 3 hours of research methodology (504) and depending on the student's prior coursework, may also require 3 hours of statistics. The core (9 hours) of the non-thesis option is 521, 522, HE 574 and 591 (1 hour). The internship experience (575) is twelve hours of credit and is the culminating experience. Students choose another 3 hours of coursework to support the teaching field. The thesis option requires six hours of Thesis 500 and an oral comprehensive examination. The 39-hour non-thesis option (36 hours if statistics is waived) is the same as described above except that students select nine hours to support the teaching field. The non-thesis option requires a comprehensive written and oral examination.

Note: For students in the Nashville area, only the training and development concentration is available.

THE PH.D. CONCENTRATION

Admission Requirements

Applicants are to submit an application for admission to The Graduate School, five letters of reference from persons familiar with their potential for success in doctoral work, and a statement describing personal career objectives directly to the Department of Human Resource.

Applicants must hold a master's degree from an accredited institution and present evidence of ability to do Ph.D. work, including having maintained a graduate GPA of 3.3 on a 4.0 scale or better. If the applicant has prior work experience in human resource development, a reference letter should also be provided by the work supervisor. Graduate Record Examination scores are required of all applicants. All applicants are required to be interviewed by the department admissions board.

Any person whose native language is not English must submit results of the Test of English as a Foreign Language (TOEFL). A minimum score of 600 is required for admission consideration.
Degree Requirements

The Doctor of Philosophy degree with a major in Human Ecology and a concentration in human resource development is for graduate students who seek careers in higher education or as administrators of HRD. The curriculum is designed to enable students to achieve professional objectives, develop needed competencies, and gain desirable experiences and understanding of human resource development. Students must possess a master's degree before acceptance to the program. A minimum of 36 hours beyond the baccalaureate is required.

Concentration (15 hours): Must include courses to support Human Resource Development and may be taken from the master's degree.

Departmental Core (17 hours): Must include 510, 511, 512, 557, 559 or equivalents and 604.

Specialization (12 hours): Must support a career path of university faculty member or manager of education/training.

Cognate (6 hours): Must be obtained from an academic unit outside the department, support specialization, and be represented by a committee member.

Related Studies (6 hours): Research and theory in support of theoretical framework.

Research and Statistics (15 hours): Statistics must include advanced statistics such as multivariate analysis and computer application, 9 hours minimum; research methodology must include 504 and 610 or equivalents, 5 hours minimum.

Internship (6-6 hours): Required for those changing career path.

Dissertation (24 hours): Must be original research project.

Detailed information regarding the Ph.D. concentration program of study may be obtained from the departmental liaison for graduate studies.

Note: For latest update, check the homepage of Department of Human Resource Development (http://hrd.he.utk.edu).

GRADUATE COURSES

415 Coordination Techniques (3) Necessary procedures, duties and responsibilities to implement, maintain, and evaluate successful cooperative education program. Prereq: Senior standing and consent of instructor. Sp

430 Principles and Organization of Business and Marketing Education (3) Historical background and development needs. Principles of vocational education in business and marketing, curriculum implications; establishing, evaluating, and improving programs.

455 Learner and Program Evaluation (3) Assessing effectiveness of training or educational programs; developing performance-based measures; evaluating job performance; and measuring learner progress. Prereq: Program Planning for Training, Development, and Education.

476 Supervised Occupational Experience (3) Practical field experience in business/industry/community-based settings related to area of study. Prereq: Senior standing and consent of advisor. May be repeated. Maximum 9 hrs. E

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

501 Survey of Human Resource Development (3) Training and development as practiced in organizations: needs assessments, development of work force skills, evaluation, development of training program proposals, assessment of personal competencies, values, goals, and training program design and administration.

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

503 Problems in Lieu of Thesis (3) May be repeated. Maximum 6 hrs. S/NC only. E

504 Research in Human Resource Development (3) Solution of problems encountered in human resource development. Prerequisites: course in human resource development. Prereq: 12 hrs of graduate credit. F, Su

505 Selection, Placement, and Follow-up Procedures in Human Resource Development (3) Methods and procedures utilized in preparing job candidates for selection and placement in instructional programs and in jobs. Collecting, analyzing, and reporting follow-up data appropriate for making personnel improvements. Prereq: Consent of instructor. Sp, Su

506 Developing Organizational Resources (3) Strategies for developing human and organizational resources through community partnerships and learning. Effective utilization of human resources through active learning programs. Sp

509 Internship in Human Resource Development (3) Practical field experiences in selected settings under supervision of practitioner and departmental representative. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. F


512 Human Resource Management (3) Process-systems approach to human resource management: independent human resource activities (planning, work design, staff development, training and development, compensation, etc.) and organizational goals.

513 Special Topics in Human Resource Development (1-3) Specific objectives, activities, and evaluation. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. F

514 Individual Study in Human Resource Development (3) Prereq: Consent of supervising instructor. Approval form must be filed in office of department head. May be repeated. Maximum 6 hrs. E

515 Microcomputer Operation and Programming in Education (3) Introduces microcomputers and BASICS programming for education and training applications. Hands-on experience in operating and programming microcomputers, writing, debugging, and running educational programs using sequential data files. Prereq: Teaching, administrative, or related experience in education or training, or consent of instructor.

516 Microcomputer Software Development (3) Advanced software design in BASICS, random access and binary files, search and sort algorithms, and bitmapped graphics for educational environment. Hands-on learning and program development. Prereq: 515 or consent of instructor.

521 Design and Development of Instruction (3) Curriculum development and program planning; design of instruction; development of teaching materials for classroom and educational purposes. Intended for students in family and consumer sciences, business, marketing, technology and industrial education. F

522 Professional Practices for Educators (3) Topics essential to effective classroom teaching; evaluation of students, youth organizations, advisory committees, classroom management, trends and issues impacting school work preparation. Coreq: Human Ecology 575 and 591. Sp

531 Organization and Supervision of VOE and Marketing Programs (3) Developing office, market occupations, guidelines in cooperative laboratory, and model office programs. Trends in office and marketing education, physical facilities, state plans, instructor qualifications and advisory committees. Prereq: Consent of instructor. F, Su

550 Administration of Industrial Education Programs (3) Developing, staffing, administering and evaluating trade, technical and educational programs in secondary and post-secondary school settings. Prereq: Consent of instructor. Sp

551 Supervision of Industrial Education Programs (3) Techniques used to improve industrial education programs. Staff development, curriculum improvement, and program updating techniques. Prereq: 456 or equivalent. F, Su

552 History and Philosophy of Industrial Education (3) Social, political, and economic events that impact development of industrial education. Philosophical problems of definition, values, and principles of industrial education. Prereq: Consent of instructor. Sp

553 Planning Technical Education Facilities (3) Preparation of educational specifications, site selection, and working relationships with other professionals involved in process of planning technical education facilities. Prereq: Consent of instructor. Sp, Su

554 Technical Program Planning (3) Instructional systems attending to analysis, design, development, implementation, and evaluation of trade, technical supervision and related training. Prereq: Human resource development course and consent of instructor. F, Su

555 Curriculum Planning for Industrial Education Programs (3) Developing performance-based, criterion-referenced instructional programs. Prereq: 374 or 554 or consent of instructor. Sp, Su

556 Organizational Development (3) Strategies and interventions for organizational development: training and development of staff. Models, assessment, organizational change and consultant's role. Prereq: 512 or consent of instructor. F

557 Methods of Teaching Conceptual Content (3) Proper selection and effective application of methods for teaching and learning conceptual content. Communication strategies for conceptual content comprehension, retention and application.

558 Seminar in Industrial Education (1-3) Current issues, innovations, problems associated with technical programs. Prereq: 12 hrs of graduate courses. May be repeated. Maximum 6 hrs.

559 Program Evaluation (3) Concepts, principles, practices, theories, and trends related to program evaluation. Planning and conducting a comprehensive program evaluation in various settings of situations. Fundamentals of design, measurement, return-on-investment (ROI), and presentation and dissemination of results to stakeholders.

560 International Perspective of Workforce Training (3) Examination and comparison of workforce systems in high industrialized countries. Comparison of training programs, out-of-school training systems, update training of incumbent workers, retraining displaced workers, transfer of new technologies, and role and responsibilities of businesses, private sector organizations/agency, and state and federal government agencies.

562 Grant Writing and Project Implementation (3) Writing grant proposals, negotiating with funding sources, implementing, and maintaining funded programs, and closing out projects at funding support.

564 Self-Directed Work Teams (3) Theory and practice of implementing self-directed work teams, motivating employees, increasing employee productivity via teams and related issues.

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

601 Curriculum Planning in Human Resource Development (3) Curriculum theory, models, contents, planning evaluation and implementation of specialized program areas. Prereq: 555 or equivalent.

604 Seminar in Human Resource Development (1) Required for all coursework, preparatory or didactic, that is involved in the doctoral residency. May be repeated. Maximum 3 hrs. S/NC only. E

610 Research Development in Human Resource Development (3) Proposal development, theoretical base, research design, sampling, application of statistics, and evaluation of research in human resource
Inclusive Early Childhood Education

(College of Education)

MAJORS

Education.............................................M.S., Ph.D.

Susan Benner, Leader

Professors:

Benner, Susan M., Ed.D. ..........Columbia
Blank, Karmi J., Ph.D. ............Ohio State
Coleman, Laurence J., Ph.D. ....Kent State
Hatch, J. Amos, Ph.D. ..........Florida

Associate Professor:

Cagle, Lynn C., Ed.D. ..........Georgia

Assistant Professor:

Judge, Sharon L., Ph.D. ..........California (Santa Barbara)

The Inclusive Early Childhood Education unit participates in graduate programs leading to degrees, majors, and concentrations in:

Master of Science

Education

Early childhood special education

See Education under Fields of Instruction for full description of all degree requirements. Early childhood licensure and degree programs are also available through the College of Human Ecology.

The unit is focused on the preparation of teachers for the education of all young children with and without disabilities in inclusive settings. All young children are defined as children from birth to age eight, including children of poverty, those of color, with disabilities, with advanced development and "mainstreamed" children.

GRADUATE COURSES

445 Early Childhood Education: Program Development and Teaching in Kindergarten (3) Curriculum planning, classroom organization and management practices for teaching young children; philosophy of kindergarten to total elementary school. Prereq: Admission to teacher education.

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. Sp

471 Early Childhood Special Education (3) Assessment, curriculum planning and development and teaching approaches used in early childhood special education. Prereq: Admission to teacher education.

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

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


504 Clinical Experience in Teaching and Supervision of Exceptional Children (3-9) Placement in educational settings. May be repeated. Maximum 9 hrs. S/N or letter grade. (Same as Rehabilitation and Deafness 504.)

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/N only. E

518 Educational Specialist Research and Thesis (3) May be repeated. P/NP only. E

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.

554 Assessment in Early Childhood Special Education (3) Development of knowledge and skills in appropriate formal and informal assessments of handicapped infants and young children: screening, identification, diagnosis, placement and programming assessment issues. Prereq: 553 or consent of instructor.

558 Neuromuscular and Health Disorders: Educational Implications (3) Neurological impairments, physical disabilities and special 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, Prevention, or promoting social and emotional development. Prereq: 451 and 465 or equivalent or consent of instructor.

585 Instructional Systems for the Gifted and Talented (3) Instructional methods and systems evaluated in terms of effectiveness in various educational environments. Prereq or coreq: 554 or consent of instructor.

586 Curriculum for Early Childhood Education (K-3) (3) Theoretical foundations and current research in content and skill areas of curriculum for kindergarten-grade 3; application to local school setting. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. Sp, Su

567 Application of Theory in Early Childhood Education (K-3) (3) Principles and practices from selected theoretical orientations. Prereq: Course in early childhood education or consent of instructor. May be repeated. Maximum 6 hrs. F, Su

589 Early Childhood Special Education: Theories and Interventions (3) Theoretical perspectives of early childhood special education: exploration of programmatic models, family-focused concepts and curriculum development.

570 Creative Problem-Solving Strategies for Special Educators (3) Techniques for solving problems encountered by special educators in any setting.

579 Special Topics (1-3) Prereq: Admission to graduate program. May be repeated. Maximum 9 hrs. S/N only.

584 Seminar in Early Childhood Education (3) Analysis of research and theory in early childhood education; educational process of young children. Prereq: Course in early childhood education. May be repeated. Maximum 6 hrs. Sp, Su

581 Clinical Studies (4) Relationship between educational theory and application during internship; research project, development of portfolio, and capstone experience.

853 Independent Study (1-3) May be repeated. S/N only only.

854 Supervised Readings (1-3) May be repeated. S/N only.

585 Special Topics (1-3) May be repeated. S/N or letter grade. E

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

604 Seminar in Curriculum and Instruction (1) Required 2 consecutive semesters. S/N 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/N only.

620 Internship in Research in Special Education and Rehabilitation (3-9) Advanced level field experiences under supervision of practitioner. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. S/N only.


850 Advanced Studies in Early Childhood Education (3) Prereq: 2 graduate courses in early childhood education and consent of instructor. May be repeated. Maximum 6 hrs. S/N only.

879 Special Topics (1-3) Prereq: Admission to doctoral program. May be repeated. Maximum 9 hrs. S/N only.

889 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/N only.

953 Independent Study (1-3) May be repeated. S/N or letter grade.

604 Supervised Reading (1-3) May be repeated. S/N or letter grade.

966 Special Topics (1-3) May be repeated. S/N or letter grade.

Industrial and Organizational Psychology

(College of Business Administration)

MAJOR

DEGREES

Psychology.............................................Ph.D.

Robert T. Ladd (Liaison), Director

Committee:

Fowler, Oscar S., Management
James, Lawrence R., Management
Larson, John M., Jr. (Emeritus), Management
Rush, Michael C., Management
Russell, Joyce E. A., Management
Schumann, David W., Marketing, Logistics & Transportation

Industrial and Organizational Psychology
The doctoral program is designed to prepare students for personnel, managerial, and organizational research; for university teaching; and for consulting relationships with industry. The program emphasizes a scientific/practitioner model in applying and conducting research based on accepted theory, organizational behavior, psychology, management, and statistics. The degree program is administered by a committee appointed by the Associate Vice Chancellor and Dean of The Graduate School on recommendations from the Management Department head and the program director.

It is intended that students entering the I/O program will represent widely different undergraduate and graduate backgrounds including psychology, business administration, engineering, science, and liberal arts. The first-year program provides the opportunity to take courses that will assist the students in attaining a reasonable level of sophistication in areas of deficiency.

ADMISSION REQUIREMENTS

Applicants for admission should request information and application forms from both the Office of Graduate Admissions and Records (218 Student Services Building) and the Director, Industrial and Organizational Psychology Program, (408 Stickey Management Center, The University of Tennessee, Knoxville, TN 37996).

Two separate applications must be completed: one application for admission to The Graduate School (apply for major in Industrial and Organizational Psychology) and one application for admission to the Industrial and Organizational Psychology program. Deadline: New students are admitted in fall semester only, and applications must be received by the Graduate Admissions and Records Office by February 1.

The master's degree in Industrial and Organizational Psychology is generally not required of individuals pursuing a doctoral degree.

General Requirements

At least one year of college mathematics and one course in statistics are required. Ordinarily, an undergraduate grade-point average of 3.5 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 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 Statistics core; must complete an applied research project prior to beginning dissertation work; must pass a comprehensive examination; and must pass a final oral examination on their dissertation research.

Course Requirements: Hours

<table>
<thead>
<tr>
<th>Course Requirements</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/O Psychology Core</td>
<td>9</td>
</tr>
<tr>
<td>567, 568, &amp; 569</td>
<td></td>
</tr>
<tr>
<td>Research Core</td>
<td>12</td>
</tr>
<tr>
<td>Statistical Principles (537</td>
<td></td>
</tr>
<tr>
<td>&amp; 538 or equivalents)</td>
<td></td>
</tr>
<tr>
<td>Multivariate Statistics (570</td>
<td></td>
</tr>
<tr>
<td>&amp; 679 or equivalent)</td>
<td></td>
</tr>
<tr>
<td>Advanced Research Methods (605</td>
<td></td>
</tr>
<tr>
<td>or equivalent)</td>
<td></td>
</tr>
<tr>
<td>General Psychology Core</td>
<td>9</td>
</tr>
<tr>
<td>One course in each of the 9</td>
<td></td>
</tr>
<tr>
<td>following areas: biological</td>
<td></td>
</tr>
<tr>
<td>bases of behavior, cognitive</td>
<td></td>
</tr>
<tr>
<td>bases of behavior, history</td>
<td></td>
</tr>
<tr>
<td>and systems of psychology.</td>
<td></td>
</tr>
<tr>
<td>I/O Psychology Seminars</td>
<td>9</td>
</tr>
<tr>
<td>600 level I/CPSY courses,</td>
<td></td>
</tr>
<tr>
<td>from a program committee</td>
<td></td>
</tr>
<tr>
<td>approved list.</td>
<td></td>
</tr>
<tr>
<td>Approved Electives</td>
<td>9</td>
</tr>
<tr>
<td>Courses supporting the 3</td>
<td></td>
</tr>
<tr>
<td>student's course of study.</td>
<td></td>
</tr>
<tr>
<td>Supervised practicum, internship, or field training (690)</td>
<td>15</td>
</tr>
<tr>
<td>Ethics (635 or equivalent)</td>
<td>3</td>
</tr>
<tr>
<td>Dissertation (600)</td>
<td>24</td>
</tr>
<tr>
<td>TOTAL</td>
<td>90</td>
</tr>
</tbody>
</table>

The Program Committee may require any student in the doctoral program to prepare a master's thesis and complete the master's degree. This policy will be implemented by the committee at such time as a review of the student's record suggests that additional evidence is required regarding the student's qualifications for pursuing a Ph.D. degree.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The Ph.D. program is available to residents of Alabama, Arkansas, Kentucky, Virginia, or West Virginia. Additional information may be obtained from the Admissions Specialist in the office of Graduate Admissions and Records.

GRADUATE COURSES

<table>
<thead>
<tr>
<th>Course Requirements</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 Thesis (1-15) P/NP only</td>
<td>E</td>
</tr>
<tr>
<td>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 complete. May not be used toward degree requirements. May be repeated.</td>
<td>E</td>
</tr>
<tr>
<td>525 Research in Industrial/Organizational Psychology (1-3) Available only to students admitted to program or by prearrangement with program director. May be repeated.</td>
<td>E</td>
</tr>
<tr>
<td>567-68 Proseminar in Industrial/Organizational Psychology (3,3) Basic thought, concepts, and issues required for advanced graduate study in industrial and organizational psychology. Must be taken during first year of study in program. Consent of instructor required for non-prog students.</td>
<td>E</td>
</tr>
<tr>
<td>569 Applied Measurement for Industrial/Organizational Psychology (3) Basic techniques for collection and evaluation of individual and organizational data using both classical and modern psychometric techniques. Relevant statistical models: reliability analysis, and exploratory and confirmatory factor analyses.</td>
<td>E</td>
</tr>
<tr>
<td>600 Doctoral Research and Dissertation (3-15) P/NP only</td>
<td>E</td>
</tr>
</tbody>
</table>

605 Advanced Research Methods in Psychology (3) Critical analysis of new and evolving techniques for psychological research; new statistical and psychometric methods.

610 Individuals in Organizations Seminar (3) Bridging principles and processes which link individual attributes with more macro organization concerns: culture, climate, and group decision-making.

611 Seminar in Organizational Leadership (3) Current theories, concepts, and issues associated with psychology of organizational leadership. Prereq: 567-68 or consent of instructor.

612 Seminar in Work Motivation (3) Current theories, concepts, and issues associated with psychology of work motivation. Prereq: 567-68 or consent of instructor.

613 Seminar in Performance Appraisal (3) Current issues, problems, and research in performance appraisal and criterion development; applications in compensation. Prereq: 567-68 or consent of instructor.

614 Seminar in Employee Selection (3) Current issues, concerns, and methods used in employee selection. Prereq: 567-68 or consent of instructor.

615 Seminar in Organizational Training and Development (3) Current issues, problems, and research in training and development. Prereq: 567-68 or consent of instructor.

625 Topics in Organizational Psychology (3) Topics vary.

626 Topics in Industrial Psychology (3) Topics vary.

627 Structural Equation Models in Organizational Research (3) Issues related to analysis of organizational data using structural equation and related techniques.

638 Personality Assessment (3) Review of key domains of social cognition: measurement systems which use individual differences in social-cognitive bases as basis for measuring personality.

639 Ethical and Professional Issues in Industrial/Organizational Psychology (3) Issues involved with ethical practice in research, academic, organizational, and consulting situations.

690 Supervised Practicum, Internship or Field Training in Industrial/Organizational Psychology (1-15) One credit hour per 30 hours of practice. S/NC or letter grade.

Industrial Engineering

(College of Engineering)

MAJOR DEGREE

Industrial Engineering ............... M.S., M.S.-MBA

C. H. Aikens, Head

Professors:

Bontadelli, J. A., P.E., Ph.D. .......... Ohio State
Claycombe, W. W., PE, Ph.D. ......... VPI
Devine, Michael D., Ph.D. ......... Texas
Garrison, G. W., (UTS), Ph.D. ......... NC State
Loveless, Howard L. (Emeritus), PE, M.S. ......... NC State
Schmitt, H. W., Ph.D. ............ Texas

Associate Professors:

Aikens, C. H. (Liaison), PE, Ph.D. ......... Tennessee
Halley, M. L. (UTS), PE, Ph.D. ......... Texas Tech
Hungerford, J. C., Ph.D. ............. Ohio State
Jackson, D. F., Ph.D. .............. Tennessee
Kirby, K. E., Ph.D. ............. Tennessee

Assistant Professors:

Coleman, G. D. (UTS), PE, Ph.D. ......... VPI
The Department of Industrial Engineering offers a graduate program leading to the Master of Science degree with a major in Industrial Engineering, concentrations in traditional Industrial engineering, engineering management, and manufacturing systems. The Ph.D. with a major in Engineering Science is available through the Department of Mechanical and Aerospace Engineering and Engineering Science with a concentration in industrial engineering.

**THE MASTER'S PROGRAM**

Students who enroll in the Master of Science degree may select a concentration in industrial engineering, engineering management or manufacturing systems engineering. Admission is open to graduates of ABET-accredited undergraduate curricula in engineering, or to graduates of other technical curricula who satisfy prerequisites depending on their academic backgrounds. Policies concerning prerequisite requirements will be determined by the Industrial Engineering faculty.

**Industrial Engineering**

Under the industrial engineering concentration, students may select either the thesis or non-thesis option. The thesis option requires 27 hours of coursework and a 6-hour thesis. The non-thesis option requires 30 hours of coursework plus a 3-hour design project. Depending upon a student's background and career objectives, graduate work in industrial engineering enables the student to select an area of specialization from operations research, human factors engineering, information systems engineering, maintenance, and reliability engineering, or general industrial engineering.

**Engineering Management**

The engineering management concentration has an additional admission requirement of two years' U.S. industrial experience as a practicing engineer or scientist, or current full-time employment in an appropriate engineering or applied science position. The program is non-thesis and requires 33 hours of coursework plus a 3-hour capstone project. This concentration is fully supported off-campus utilizing electronic media for video taping and interactive distance teaching methods.

**Manufacturing Systems Engineering**

Under the manufacturing systems engineering concentration, students may select either the thesis or non-thesis option when taking the M.S. degree program, or the non-thesis option only when taking the dual M.S.-MBA program. The thesis option requires 27 hours of coursework and 6 hours of thesis. The non-thesis option requires 30 hours of coursework plus a 3-hour design project. A maximum of 6 semester hours of graduate work in engineering may not be used for graduate credit in the dual program.

**DUAL M.S.-MBA PROGRAM**

The College of Engineering and the College of Business Administration offer a coordinated program leading to the conferral of the Master of Science degree with a major in Industrial Engineering (concentrations in manufacturing systems engineering) and the Master of Business Administration degree (concentration in manufacturing management). The dual program saves the student one or two semesters over the time that would be required to earn both degrees independently.

The establishment of the dual program addresses the critical need for personnel trained in both engineering and management who can integrate this increasingly complex body of knowledge in achieving the efficient operation of manufacturing and production firms. The program is designed to accommodate the interests of students who desire a career leading to a leadership position in a manufacturing organization.

**Admission Requirements**

Applications are accepted for fall semester only. Applicants for the M.S.-MBA program must make separate application to, and be competitively and independently accepted by, the Graduate School for the Master of Business Administration degree program and the Master of Science degree program with a major in Industrial Engineering, and by the Dual Program Committee. Students will initially apply for the MBA program. Students accepted for the dual M.S.-MBA program will be assigned by the Dual Program Committee advisors who will be responsible for supervision of the student's progress through the dual program. Applications by U.S. citizens and permanent residents received after the MBA application deadline (March 1) will be considered as space allows. Additional information is required, and different application dates are established by the Graduate School for International students.

**Curriculum**

The curriculum in the first academic year of the dual M.S.-MBA program is the two-semester core of the MBA program (two 15-hour courses, one each semester). A 1-hour seminar course each semester in manufacturing will also be taken concurrently during the first two semesters (not for graduate credit). A 3-hour design or industrial project will be accomplished in the summer term of the first year. This will be part of a summer internship in industry, and the project will be academically supervised by a faculty member associated with the dual program.

During the second year, 27 hours of coursework will be completed in the manufacturing systems engineering concentration in Industrial Engineering plus an additional 9 hours of graduate courses in the College of Business Administration acceptable in meeting the requirements of the MBA program. Fifteen hours will be taken during each of the first two semesters of the second academic year. A culminating 6-hour integrated case study requiring use of previous material, and a final examination as required by the Dual Program Committee, will be taken during the first session of summer term of the second year.

The dual degree candidate must satisfy the curriculum and graduation requirements of the Department of Industrial Engineering and the College of Business Administration. Dual students withdrawing from the dual program before completion of both degrees will not receive credit toward graduation in either degree program for courses in the other degree program, except as such courses qualify for credit without regard to the dual degree program. The M.S. and the MBA degrees will be awarded upon successful completion of the requirements of the dual program.

**Approved Dual Credit**

A maximum of 6 semester hours of approved graduate-level courses completed in the College of Business Administration may be counted toward the M.S. degree program with a major in Industrial Engineering. A maximum of 15 semester hours of approved graduate-level courses completed in the Department of Industrial Engineering may be counted toward the MBA degree program. The approval of courses is the responsibility of the Dual Program Committee and the student's assigned advisor.

Note: Any 400-level course required in the Bachelor of Science in Industrial Engineering program at UT-Knoxville may not be used for graduate credit in the M.S. degree program.

**Industrial Engineering**

**GRADUATE COURSES**

401 Integrated Manufacturing Systems (3) NC and CNC machine tools, robotics and related materials handling systems, hard automation, alternative integrated systems, and manufacturing systems supporting CIMS. Fall semester. Prereq: 400.

402 Production System Planning and Control (3) Theory and application of forecasting systems, regression and time series models, independent demand inventory models, development of safety stock. Coverage of all modules of Manufacturing Resource Planning (MRP) Systems: master production scheduling, resource requirements planning, bill of material and inventory file structures, material requirements planning, capacity planning, shop floor and purchase order control. Overview of just-in-time inventory concepts and MRPs role in manufacturing automation. Preprq: 301.

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. Preprq: 392, 401.


412 Quantitative Methods in Project Management (2) Project planning, scheduling, and control based on network and precedence diagramming methods. Resource allocation and time-cost trade off analysis, multi-project control, computer applications, and PERT methods of handling uncertainty in activity time estimates.

421 Information Systems Analysis and Design (3) Systems engineering approach to analysis, design, development, and implementation of systems of information. Informational requirements of engineering systems are related to the development of applications packages. Prereq: Simulation or consent of instructor. 2 hrs and 1 lab.

422 Senior Industrial Engineering Problems Analysis (3) Application of industrial engineering to field assignments in local manufacturing or service enterprise. Problems selected will be appropriate to the needs of the student and will be assigned in consultation with the instructor. Prereq: Probability and Statistics for Scientists and Engineers, or equivalent.


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 compared to fractional designs to balance experimental efficiency with loss of information. Lab component utilizes statistical and simulation software designed to provide hands-on experience. Prereq: Engineering Data Analysis and Process Improvement, Simulation, Probability and Statistics for Scientists and Engineers, or Consent of Instructor. 2 hrs and 1 lab.

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

501 Design Project (1-3) Enrollment limited to industrial engineering students in non-thesis program. May be repeated. Maximum 6 hrs. S/NC only.

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

513 Facilities Planning and Design (3) Modern materials handling techniques, computer-aided layout techniques, application of operation research models, and use of these to design manufacturing facility. Prereq: Production Facilities Design and Material Handling or consent of instructor.

514 Advanced Information Systems Analysis and Design (3) Systems analysis and systems control concepts applied to the implementation of IE in office and factory of future. Management support systems, decision support systems, and integrated support systems. Prereq: Consent of instructor.

515 Advanced Production and Inventory Systems (3) Advanced topics in production planning and inventory systems. Material requirements planning, production planning and master scheduling, just-in-time concepts, and computer simulation for production systems. Prereq: Consent of instructor. 2 hrs and 1 lab.

516 Statistical Methods in Industrial Engineering (3) Application of classical statistical techniques to industrial engineering problems. Statistics and statistical thinking in managerial context of organizational improvement; descriptive statistics and distribution theory; relationship between statistical process control techniques and statistical quality control procedures; hypothesis testing; goodness-of-fit testing; linear regression and correlation; analysis of variance; single and multiple factor experimental design. Prereq: Probability and Statistics for Scientists and Engineers, or equivalent.

517 Reliability Engineering (3) Continuous time random processes with applications to availability of equipment and manufacturing systems. Failure densities and failure data analysis, reliability theory, and reliability-based criteria for product acceptability. Prereq: 516.

518 Advanced Engineering Economic Analysis (3) Application of engineering economic analysis in complex decision situations. Inflation and price changes; uncertain knowledge and value of information; capital financing and project allocation; evaluations involving equipment replacement, investor-owned utilities, and public works projects; probabilistic risk analysis including computer simulation and decision trees; multi-attribute decision analysis; and other advanced topics. Prereq: 403 and Probability and Statistics for Scientists and Engineers, or equivalent.

519 Human Factors Engineering and Ergonomics (3) Application of the scientific study of human factors and ergonomics concepts and principles to design and analysis of human systems and products. Human as biomechanical system; human information processing; minimization of human error; anthropometry; anatomy and physiology; physical and mental workload; effects of environmental factors: lighting, temperature, noise, and vibration on humans; manual materials handling and back injuries; design of workstations and office ergonomics; design of displays and controls; human tool design; and cumulative trauma injuries. Prereq: Probability and Statistics for Scientists and Engineers or consent of instructor.

520 Human Factors and Product Safety Engineering (3) Role of human factors and safety engineering, legal implications, and product liability, system safety, and failure analysis. Prereq: Consent of instructor.

521 Advanced Human Factors Engineering Methodology (3) Advanced methodologies used in human factors engineering. Observational methods, function analysis, comparison of human factors design methods; human reliability and error prediction; evaluation of human-machine interfaces; modeling techniques; questionnaires and surveys; data collection and analysis techniques. Prereq: 519 or consent of instructor.

522 Optimization Methods in Industrial Engineering (3) Classical optimization applied to constrained and unconstrained problems, non-linear functions, and constrained functions and techniques; decision making under uncertainty; game theory; and dynamic programming. Prereq: Operations Research or Engineering Management 500.

523 Mathematical Programming (3) (Same as Management Science 531)


525 Systems Modeling and Simulation (3) Modeling of discrete, continuous, and combined systems using current simulation software. Input distributions, output data analysis, model validation, variance reduction techniques, and design of simulation experiments. (Same as Management Science 526).

526 Lean Production Systems (3) Characteristics and performance of mass and lean production systems. Lean production concepts and principles. Planning, designing, and implementing lean production systems: line balancing, setup time reduction, cost management, maintenance support, and other selected topics. Application at enterprise level to achieve sustainable competitive goals. Prereq: Consent of instructor.

529-90-93 Special Topics in Industrial Engineering (1-3,1-3,1-3) Individual or group research projects. Prereq: Consent of instructor. May be repeated. 2 hrs and 1 lab.

601 Operations Research Models in Engineering Economy (3) Mathematical programming techniques applied to capital budgeting; advanced topics in multiple attribute decision analysis; information analysis and decision making; artificial intelligence in complex decision analyses. Prereq: 518 and 523.

602 Nonlinear Optimization (3) (Same as Management Science 651)


606 Advanced Topics in Human Factors, Safety and Biomechanical Engineering (3) Application of advanced analysis and design methods to man-system safety, epidemiology of accidents and injuries, and study of injury causal mechanisms. Injury models and theories of development of injury, loss, and risk and safety engineering design. Prereq: Consent of instructor.

619-92-93 Advanced Topics in Industrial Engineering (3,3,3) To study individually or in groups. Prereq: Graduate standing or permission of instructor. May be repeated with consent of instructor.

Engineering Management

GRADUATE COURSES

501 Capstone Project (3-6) Application-oriented project to show competence in major academic area. Prereq: Enrollment in engineering management. May be repeated. Maximum 6 hrs. S/NC only.

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

531 Motivation and Culture in Engineering Management (3) Motivational theories and practice to improve individual and organizational effectiveness. Attention paid to developing strategies and implementing meeting goals, improving creativity/innovation, and leadership and personal interpersonal skills. Improves through organizational structure, policies, and work design. Prereq: 533 or consent of instructor.

532 Productivity and Quality Engineering (3) Productivity and quality measures defined and used to analyze current competitive position of important sectors of American industry with respect to national and international competition. Study of management theorists and systems which promote or inhibit productivity or quality improvements.

533 Theory and Practice of Engineering Management (3) Management decision making and implementation of project planning and management; marketing and competition in global economy; finance; organization; systems thinking; team building; corporate culture, and role of new organization, and quality, empowerment, and learning organizations. Principle application to work settings and case studies.


535 Management of Technology (3) Creativity and innovation; incorporation of advanced technology equipment; application of systems thinking; new methods in business and manufacturing organizations; justifying technology; assimilating and managing technology; changing management roles; and impact of new technologies. Prereq: 539 and Industrial Engineering 518.

536 Project Management (3) Development and management of engineering and technology projects. Project proposal preparation, resource and cost estimating, and project planning, organizing, and controlling: network diagrams and other techniques. Role of project manager: team building; conflict resolution; and contract negotiations. Discussion of typical problems and alternative solutions. Case studies and student projects. Prereq: 537 or consent of instructor.

537 Analytical Methods for Engineering Managers (3) Survey of management analysis and control systems through IE techniques. Qualitative and quantitative systems: methods analysis; work measurement; incentive systems; human resources; cost and financing; production and inventory control, facility layout, linear programming, and operation research techniques. Not for credit for students with undergraduate degrees in industrial engineering.

538 New Venture Formation (3) Factors other than mechanical or chemical which enter into successful establishment of manufacturing or service enterprise. Overview of planning and evaluation. Cost and location studies and market analysis to determine commercial feasibility of new ventures. Prereq: 537.

539 Strategic Management in Technical Organizations (3) Strategic planning process and strategic man-
agement in practice; corporate vision and mission; product, market, organizational, and financial strategies; external factors; commercialization of new technologies; and composition and beyond. Pre: 533 and Industrial Engineering 516 or consent of instructor.


541 Total Quality Management and Beyond (3) Continuous improvement in capabilities, competitiveness, and productivity of organizations. Principles of total quality management: systems theory and analysis; performance measurement; and application of statistical techniques in continuous improvement. Team building and leadership issues, and case studies. Pre: 518.


Information Sciences

(Office of the Vice Chancellor for Academic Affairs)

MAJOR DEGREE
Information Sciences M.S.

C. W. Minkel, Interim Director

Professors:
Penniman, W. David, Ph.D. ......... Ohio State Tenopir, Carol, Ph.D. ......... Illinois Wilson, P. (Emeritus), Ph.D. ......... Michgan

Associate Professors:

Assistant Professors:
Bilal, Dania, Ph.D. ............... Florida State Raber, Douglas, Ph.D. ............ Indiana Wang, Peiling, Ph.D. ............ Maryland Watson, Jinx, Ed.D. ............. Vanderbilt Whitney, Gretchen, Ph.D. ........ Michigan

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 goals and objectives of the school are:

A. To prepare students to understand the nature of information and the role of the library

and other information agencies in the management of information resources, and the facilitation of information transfer. Students will demonstrate:

1. Knowledge of the generation, production, management, dissemination and uses of information.
2. Knowledge of the roles of various organizations/institutions in promoting the flow of information.
3. An understanding of the role of the information professional as mediator between information resources and their users.
4. An understanding of the roles of various tools and technologies in facilitating access to information.
5. An understanding of the structure and content of information resources in various formats and subjects.
6. Knowledge of theoretical and practical evolution of information sciences and technologies and their relationship with other disciplines.
7. Competence in creating, managing and accessing information in a variety of formats.
8. To provide services to the state, region, and nation in association, consulting and continuing education activities which will promote the development and improvement of information systems and services such that the school's contributions reach beyond its immediate academic programs. The school will provide:

1. Continuing education for information professionals and, on a selective basis, to persons outside the information field.
2. Advisory services to information organizations.
3. Leadership for professional associations.
4. To conduct basic and applied research which promotes the generation of new knowledge, services and technology. The school will encourage:
5. Research which strengthens its instructional and public service programs.
6. The use of a variety of research methods.
7. Sharing the results of its research.
8. Increased research quality and productivity.

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.

1. 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.
2. 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 43 semester hours of graduate courses, 16 hours of which form a core curriculum required of all students. Either a thesis or a non-thesis option is available, with 6 hours required for thesis credit. At least 37 hours must be taken in the School of Information Sciences, allowing up to 8 hours outside the school with a maximum of 6 from outside the University.

Core Curriculum

The core curriculum is a 18 semester hour sequence of six courses required of all students: 490, 520, 530, 561, 580. These courses address the evolving information environment; foundations of information sciences and technologies; information resources selection, acquisition and evaluation; information access and retrieval. The core curriculum includes a one-hour electronic information and communications laboratory experience required of students during the first semester: 504.

The 16 hour core is prerequisite to all elective courses for students enrolled in the MS degree program. Elective courses may begin in the final semester of core course work with permission of the advisor and the instructor of each elective course selected.

Individualized Curriculum Approach

Students, in consultation with an 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, online information retrieval specialist, medical or law librarian, reference librarian, youth services specialist, and many others. Once the core courses have been completed, students are encouraged to take advantage of the individualized curricular approach.

Whatever individualized curriculum is chosen, all students who complete the program receive an M.S. degree accredited by the American Library Association (ALA).

For those pursuing Tennessee Department of Education licensure as a school library information specialist, stipulated requirements apply. See following section.

Tennessee State Department of Education School Library Information Specialist Requirements

The requirements for the Tennessee State Department of Education School Library Information Specialist Initial Endorsement include the 16-hour core plus 551, 567, 571, 572, 586, 595 (9 hours), and 573. IS 595 and 573 must be taken concurrently in the student’s final semester. Students pursuing the endorsement must follow the non-thesis option.

The Tennessee State Department of Education School Library Information Specialist Initial Endorsement is also available to candidates who have earned an ALA accredited Master’s degree. Students are required to take 24 hours consisting of 551, 571, 572, 567 or 593 (upon approval of the faculty advisor), 595 (9 hours), and 573. IS 595 and 573 must be taken concurrently in the student’s final semester.

Additional Program Requirements

Thesis Option: Students electing the thesis option will write a master's thesis under
close supervision of a thesis committee. Six hours of Thesis (IS 500) must be taken within the 43 hours required for graduation. (Students may register for more than six hours, but only 6 hours will count toward graduation.) Students must be registered for IS 500 in the semester they complete and defend their thesis. The oral defense of the thesis (final comprehensive examination) substitutes for the written examination that is taken by non-thesis students. The writing of the master’s thesis serves as the culminating experience.

**Non-Thesis Option:** Upon completion of the required courses, all students who elect the non-thesis option must take and pass a 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:

- 587 Information System Design Project
- 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)

**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 assistantships are available through the school. Assistantships of this type carry a tuition waiver and fees as well as a stipend and require that recipients work 10 hours per week in the school.

For applications and information about financial aid and other information about the M.S. in Information Sciences, write to Admissions, School of Information Sciences, University of Tennessee, 804 Volunteer Blvd., Knoxville, TN 37996-4330.

**ACADEMIC COMMON MARKET**

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The M.S. program in Information Sciences is available to the residents of the states of Arkansas, Georgia, Virginia, or West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

**GRADUATE COURSES**

- **430** History of the Book (3) History of writing and various methods of bookmaking.
- **450** Writing About Science, Technology and Medicine (3) (Same as Journalism 450.)

**475 Utilization of Instructional Media (3)** (Same as Education in the Sciences, Mathematics, Research and Technology 475S.) E

**485 Electronic Communications and Information Resources on Internet (3)** Exploration of worldwide information and communication resources including e-mail, gopher, Archie, Veronica, WAIS, WWW, and newsgroups. F,Sp

**490 Information Environment (3)** Generation, production, management, distribution, and use of information. Roles of information in society, information seeking and user behavior, information industry, economics of information products and services, technological and organizational change, information professions, and issues. F,Sp,Su,A

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

**502 Registration and Use of Facilities (3)** Required for the student not otherwise registered during any semester when the student desires to use University facilities and/or work study facilities for hard copy work. May not be used toward degree requirements. May be repeated. S/NC only. E

**504 Electronic Information and Communications Laboratory (1)** Methods for creating and managing information in electronic form. Communication of electronic information in networked environment. Location and use of electronic information resources. F,Sp

**521 Cataloging and Classification (3)** Basic library-oriented cataloging and classification techniques, tools, and supporting operations. Descriptive cataloging, non-subject indexing, pre- and post-coordinate subject indexing, classification and categorization; authority control of index terms; standards. F,Sp,Su,A

**522 Advanced Cataloging and Classification (3)** Cataloging and classification of more difficult materials, use of larger classification systems and subject heading systems. Library of Congress Subject Headings, and Introduction to Medical Subject Headings. Prereq: 521. Sp

**523 Abstracting and Indexing (3)** Standards, procedures, and the use of manual and automatic document indexing, back-of-the-book indexing, retrieval of retrieval system performance. Search techniques for various types of databases including multimedia, full-text, numeric, bibliographic. F,Sp

**531 Sources and Services for the Social Sciences (3)** Information sources in political science, sociology, psychology, geography, history, anthropology, business, and education. F

**532 Sources and Services for Science and Engineering (3)** Information sources in engineering, physics, and life sciences. F

**533 Sources and Services for the Humanities (3)** Information sources in philosophy, religion, fine arts, performing arts, literature and languages, Organization and management of regional collections. F

**534 Government Information Sources (3)** Selection, acquisition, organization, and utilization of government information in various formats from legislative, judicial and executive branches of federal, state, local, and international government and intergovernmental agencies. Sp

**535 Advanced Information Retrieval (3)** Bibliographic, non-bibliographic, full-text databases, e.g., non-bibliographic formula and structure databases, content-paged full-text databases, and electronic document delivery alternatives, evaluation, and testing. Sp

**537 Information Industry (3)** Issues and trends concerning information industry: products and services. Standards, enabling technologies, choices of distribution media, entrepreneurial opportunities. Legal, ethical, and quality concerns. F

**538 Economics of Information (3)** Costing and pricing of information and information added services; cost-benefit analysis and tradeoffs; policy issues related to economic aspects of information exchange and transfer. F

**539 Information Policy (3)** Role of government in creation and exchange of information; review of key national and international policy areas relevant to information creation, production, and distribution; development of information policy for organizations. F

**540 Research Methods (3)** Research methods in variety of information environments: primary and secondary research; research project design; research results interpretation; analysis of research activity; techniques supporting research process. E

**550 Management of Information Organizations (3)** Supervisory and management concepts, strategies, and techniques applicable to information professional working in libraries, archives, records management, and other information organizations. F

**551 School Library Media Centers (3)** Planning, implementing, evaluating school library media centers. Cultural involvement, role of technology, site-based management; relationships with district and state services. F

**552 Information Centers in Higher Education (3)** Development, mission, trends, issues, users, services, and environment of campus information centers including libraries and alternatives: learning resources centers and library-computer center models. F

**553 Corporate Information Services (3)** Development and present status, scope and objectives. Information resources external to organization. F

**554 Public Library Management and Services (3)** Development, roles, political environment, governance, organization, management, services, marketing, and performance evaluation. Sp

**556 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. F

**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. F

**560 Information Resources Selection, Acquisition, and Evaluation (3)** Principles of development and management of collections in information agencies; communication, analysis, users needs, policies and procedures; evaluation of items and collections; selecting items to meet particular needs. F,Sp,Su,A

**561 Contemporary Book Publishing (3)** Creation, design, production, marketing, and distribution; various types and resources. F

**563 Graphic Design and Media (3)** Principles and practice in visual aspects of communications. Graphic design, typography, production techniques and publication design, design as they apply to electronic information delivery systems. F

**564 Corporate Information Systems (3)** Objectives and function elements of records systems, archival programs, management information systems and techniques for evaluating various types of organizations. Management of information internal to organizations. Sp


**566 Environmental Scanning for Information Professionals (3)** Principles and practice of environmental scanning; information evaluation and synthesis; role of strategic information in modern organizations. F

**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. F,Sp
American Studies

GRADUATE COURSES

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Ancient Mediterranean Civilizations

GRADUATE COURSES

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Asian Studies

GRADUATE COURSES

471 Selected Topics in Asian Studies (3) Content varies. May be repeated. Maximum 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 Modern Art and Film (3) (Same as Art Media/Photography 433.)

489 Special Topics in Film (3) (Same as English 489.)

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Comparative Literature

GRADUATE COURSES

401-02 Special Topics in Comparative Literature (3,3) Content varies. May be repeated. Maximum 9 hrs.

402 Latin American Studies Seminar (3) Selected topics. May be repeated. Maximum 6 hrs.

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Judaic Studies

405 Modern Jewish Thought (3) (Same as Religious Studies 405.)

425 Early Christian and Byzantine Art, to 1350 (3) (Same as Art History 425.)

431 Medieval Art of the West, 800-1400 (3) (Same as Art History 431.)

Latin American Studies

GRADUATE COURSES

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Interdisciplinary Programs

(569) Advanced Production of Audiovisual Software (3)
(Same as Education in the Sciences, Mathematics, Research and Technology 569, F,Sp)


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. Su

573 Programming for Children and Young Adults (3) Philosophy and objectives of public and school library services for children and young adults. Reading, listening, and viewing guidance for individuals and groups. Program planning, implementation, and evaluation. Pre: 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. F, Sp, Su

581 Seminar in Radio and Television (3) (Same as Broadcasting 580.)

582 Library Automation (3) Computer-based applications and systems for libraries, including MARC, bibliographic utilities, retrospective conversion, circulation systems, online catalogs, computer-based reference services, acquisitions 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. F,Sp

584 Database Management Systems (3) Defining data needs, data structures, role of operating systems in data management, file organization, database management systems, logical data models, internal data models, database administration and evaluation. Design and implementation of application using database management systems. Sp

585 Information Technologies (3) Evolution, trends, capabilities, and limitations of technologies applied to information capture, storage, preservation, access, and distribution. F,Sp

586 Information Retrieval Systems (3) Historical perspective on information retrieval research; statistical and probabilistic information retrieval techniques; cognitive user modeling; expert intermediary systems; associations, relations and hypertext.

587 Information System Design Project (3) Supervised and structured experience in design and development of computer-based information systems. Pre: 583, 584 or 586, 588, and 589. F,Sp

588 Psychology of Human-Computer Interaction (3) Survey of human-computer interaction and introduction to psychological and other behavioral science knowledge and techniques useful in design of computer systems for human use. Basic psychological phenomena of human cognition, memory, problem solving, and language and how these processes relate to and condition interaction between humans and interactive computing systems.


590 Problems in Information Sciences (3-6) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

591 Supervised Readings in Information Sciences (3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. F,Sp

592 Seminar in Information Sciences (3-6) Prereq: Consent of instructor. May be repeated with consent of advisor. Maximum 6 hrs.

593 Independent Study (3-6) Prerequisite: Consent of advisor. Maximum 6 hrs. F,Sp

594 Graduate Research Participation (3) Advanced research techniques under supervision of staff research director whose area coincides with interests of student. Prereq: Consent of advisor and research director. S/N only. F,Sp

595 Student Teaching in School Library Information Center (9) Planned professional semester: full day school library work and classroom observation activities. S/N only.

599 Practicum (3-6) Opportunity to translate theory into practice under guidance of qualified information professionals. Prereq: Completion of core and pertinent advanced courses relevant to student’s practicum design. Minimum 3.0 cumulative GPA. Written consent of advisor and approval of practicum coordinator. May be repeated. Maximum 8 hours. E

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.

American Studies

GRADUATE COURSES

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Ancient Mediterranean Civilizations

GRADUATE COURSES

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Asian Studies

GRADUATE COURSES

471 Selected Topics in Asian Studies (3) Content varies. May be repeated. Maximum 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 Modern Art and Film (3) (Same as Art Media/Photography 433.)

489 Special Topics in Film (3) (Same as English 489.)

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Comparative Literature

GRADUATE COURSES

401-02 Special Topics in Comparative Literature (3,3) Content varies. May be repeated. Maximum 9 hrs.

402 Latin American Studies Seminar (3) Selected topics. May be repeated. Maximum 6 hrs.

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Judaic Studies

405 Modern Jewish Thought (3) (Same as Religious Studies 405.)

425 Early Christian and Byzantine Art, to 1350 (3) (Same as Art History 425.)

431 Medieval Art of the West, 800-1400 (3) (Same as Art History 431.)

Latin American Studies

GRADUATE COURSES

510 Special Topics (3) May be repeated. Maximum 6 hrs.
**Linguistics**

**GRADUATECOURSES**

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, Russian 425, and Spanish 425.)

426 Methods of Historical Linguistics (3) (Same as French 426, Russian 426, and Spanish 426.)

429 Romance Linguistics (3) (Same as French 429 and Spanish 429.)

436 Structure of the German Language (3) (Same as German 436.)

438 Content of the German Language (3) (Same as German 438.)

471 Sociolinguistics (3) (Same as English 471 and Sociolinguistic 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.)

485 Special Topics in Language (3) (Same as English 485.)

490 Language and Law (3) (Same as English 490.)

510 Special Topics (3) May be repeated. Maximum 6 hrs.

546 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.

**Journalism**

**College of Communications**

**MAJOR**

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

James A. Crook, Director

**DEGREES**

**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 media: especially newspapers. Problems in management and production and outlook for new technologies. Prereq: 6 hrs of mathematics and/or accounting and senior standing. Sp


433 Advanced Editing (3) Sensitivity to language and editing skills. Headline writing, layout, and production. Prereq: Editing. Sp

444 Journalism as Literature (3) Study of writers from 17th century to modern era whose works have endured as both journalism and literature. Emerging genre called literary journalism: Meats 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 publication 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 S. Beizer. Analysis of literary qualities in quest to understand why some science writing succeeds. Prereq: Consent of instructor.


490 Advanced Photojournalism (3) Advanced principles and methods of black-and-white photography. Introduction to color photography. News and feature photographs and photo essays. Prereq: Photojournalism or consent of instructor. Sp

520 Press-Government Relations (3) Development of adversary relationship between journalists and government officials. Philosophical and legal basis for open reporting of government. Use of press by candidates and incumbents. (Same as Public Relations 520.)

525 Public Opinion (3) Role of press in developing and influencing public consensus. Social theories of public opinion and analysis of mass media's role. (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: region and specialized magazines, individual editorial projects. Prereq: 420 or consent of instructor.

550 Writing and Editing Projects (3) Specialized writing or editing interests: agriculture, politics, labor, finance, science, technical, general publications. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

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.

590 Communications and International Development (3) Relationship between mass communications and development of nations. Role of communications media of developed nations in "Third World" regions of globe. Communications as facilitator of international cooperation.
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: Public Relations Principles or equivalent. F, Sp
518 Seminar in Public Relations Issues (3) Topics vary. May be repeated. Maximum of 6 hrs.
520 Press-Government Relations (3) (Same as Journalism 520.)
525 Public Opinion (3) (Same as Journalism 525.)
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.

Language, Communication, and Humanities 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: 587 or consent of instructor. Sp
460 Teaching Reading and Literature in the Secondary School (3) Approaches for teaching basic reading skills and ways of teaching literature. Prereq: Admission to Teacher Education Program.
465 Developing Reading Skills in Content Fields (3) Development and use of instructional aids concerned with all aspects of teaching reading: videos, audiotapes, slides, charts, and learning paces.
470 Seminar in Teaching English in Secondary School (3) Issues and topics current to the field of English education. Prereq: Consent of instructor.
471 Developing Reading Skills in Content Fields (3) Development and use of instructional aids concerned with all aspects of teaching art: videotapes, audiotapes, slides, charts, and learning paces.
475 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. Required for Tennessee ESL (K-12) licensure. Prereq: 587 or consent of instructor.
477 Teaching Art (3) Development and use of instructional aids concerned with all aspects of teaching art: videotapes, audiotapes, slides, charts, and learning paces.
480 Instructional Materials and Production Related to the Teaching of Art (3) Development and use of instructional aids concerned with all aspects of teaching art: videotapes, audiotapes, slides, charts, and learning paces.
490 Special Topics in Art Education (3-6) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.
503 Independent Study (1-3) May be repeated. S/NC or letter grade. E
508 Teaching Composition in the Secondary School (3) Teaching narrative, descriptive, expository, and argumentative writing. Required 2 consecutive semesters. Prereq: 505 or consent of instructor. F
530 Production and Critical Analysis of Art (3) Relationship of production and critical analysis of works of art to discipline-based art education.
533 Reading in Community College: Research and Theory (3) Analysis of components of effective community college reading programs. Attention to research and theoretical bases. Prereq: Course in reading education or consent of instructor. Su
538 Developing Reading Skills in Content Fields (3) Techniques of teaching composition, language, and literature. Prereq: Admission to Teacher Education Program.
540 Instructional Materials and Production Related to the Teaching of Art (3) Development and use of instructional aids concerned with all aspects of teaching art: videotapes, audiotapes, slides, charts, and learning paces.
550 Seminar in Teaching English in Secondary School (3) Content varies. Theoretical and practical approaches to teaching English in secondary school. May be repeated. Su
555 Foreign Language in the Elementary Schools Practicum (3) Experiences designing, implementing and assessing second language instruction in elementary school setting. Prereq: 550 or consent of instructor.
565 Teaching Drama Grades 7-13 (3) Strategies and materials for teaching dramatic arts, including writing of plays, reading of scripts. Prereq: 587 or consent of instructor. F
566 Advanced Instructional Techniques and/or Materials for Teaching Reading in Secondary Schools (3) Advanced instructional techniques and evaluation procedures: materials analysis and preparation; trends, issues, and research in modern foreign languages and Latin. Prereq: Consent of instructor.
570 History and Philosophy of Art Education (3) United States from 1860's to present. Prereq: Consent of instructor. Su
571 Reading in Community College: Research and Theory (3) Analysis of components of effective community college reading programs. Attention to research and theoretical bases. Prereq: Course in reading education or consent of instructor. Su
572 Linguistics and the Teaching of English (3) Grammar, usage, semantics, dialectology, history of language, and lexicography. Su
573 Independent Study (1-3) May be repeated. S/NC or letter grade. E
574 Supervised Readings (1-6) May be repeated. S/NC or letter grade. E
578 Developing Speaking and Listening Skills, Grades 7-13 (3) Teaching approaches to nonverbal communication, interpersonal and group communication, written and oral presentations concerned with aesthetic considerations of areas of study: geography, history, physics, literature, languages, music, visual arts and drama.
580 Teaching Drama Grades 7-13 (3) Strategies and materials for teaching dramatic arts, including writing of plays, reading of scripts. Prereq: 587 or consent of instructor. F
581 Developing Speaking and Listening Skills, Grades 7-13 (3) Teaching approaches to nonverbal communication, interpersonal and group communication, written and oral presentations concerned with aesthetic considerations of areas of study: geography, history, physics, literature, languages, music, visual arts and drama.
Large Animal Clinical Sciences
See College of Veterinary Medicine and Comparative and Experimental Medicine

Law
(Whose Law)

MAJOR DEGREES

Law J.D., J.D.-MBA, J.D.-M.P.A.

Richard S. Wirtz, Dean

Professors:
Angley, Frances Lee, LL.M. Harvard
Best, Reba, M.L.S. Florida
Blaze, Douglass A., J.D. Georgetown
Cohen, Neil P., LL.M. Harvard
Cook, Joseph G., LL.M. Yale
Hardin, Patrick, J.D. Chicago
Hess, Amy M., J.D. Virginia
Jones, Durward S. (Emeritus), J.D. North Carolina
King, Joseph H., J.D. Pennsylvania
Lacey, Forrest W. (Emeritus), S.J.D. Michigan
Le Clercq, Frederic S. (Emeritus), LL.B. Duke
Lloyd, Robert M., J.D. Michigan
Overton, Elvin E. (Emeritus), S.J.D. Harvard
Phillips, Jerry J., J.D. Yale
Picquet, Cheryn, M.S.L.S. Tennessee
Reynolds, Glenn H., J.D. Yale
Rickin, Dean H., J.D. Vanderbilt
Sewell, Tokey H. (Emeritus), LL.M. George Washington
Sobleski, John L., J.D. Michigan
Wirtz, Richard S., J.D. Stanford

Associate Professors:
Aarons, Dwight, J.D. U.C.L.A.
Anderson, Gary L., LL.M. Harvard
Belitina, William J., J.D. Miami
Black, Jerry P., Jr., J.D. Vanderbilt
Bunker, Mary Garrett, J.D. George Washington
Cornett, Judy M., J.D. Tennessee
Davies, Thomas Y., J.D. Northwestern
Gray, Grayford B., J.D. Vanderbilt
Kennedy, Desiree A., L.L.M. Temple

Leatherman, Don A., L.L.M. New York
McAlpine, Janice E., J.D. Michigan
Medill, Colleen E., J.D. Kansas
Parker, Carol M., J.D. Illinois
Pierce, Carl A., J.D. Yale
Plank, Thomas E., J.D. Maryland
Star, Barbara, J.D. New York
Stein, Gregory M., J.D. Columbia
Thorp, Steven R., J.D. Mercer
Wertheimer, Barry M., J.D. Duke

Assistant Professors:
Browne, Kelly K., J.D. Cincinnati
Cio的文字被删除了。 

The College of Law offers the Doctor of Jurisprudence degree program; a dual degree program with the College of Business Administration leading to the J.D. and the Master of Business Administration degree; and a dual program degree with the Department of Political Science, College of Arts and Sciences, leading to the J.D. and Master of Public Administration. In addition graduate students may be eligible to take a limited number of law courses to count toward a graduate degree.

Current information regarding admission, financial aid, course requirements, academic policies, extracurricular activities, and student services is available from the Admissions Office, The University of Tennessee, College of Law, 1505 W. Cumberland Ave., Knoxville, Tennessee 37996-1810. Completed application should be received before February 1 of the year of requested admission.

DEGREE OF DOCTOR OF JURISPRUDENCE

The degree of Doctor of Jurisprudence will be conferred upon candidates who complete, with the required average, six semesters of resident law study and who have 89 semester hours of credit, including all required courses. The required average is 2.0 and that average must be maintained on the work of all six semesters and also for the combined work of the grading periods in which the last 28 credit hours earned in residence were earned. Averages are computed on weighted grades. Grades are on an alphabetical scale from A+ to F. No credit toward the J.D. degree is awarded for grades of D- or F. New to the Admissions Office, The University of Tennessee, College of Law, 1505 W. Cumberland Ave., Knoxville, Tennessee 37996-1810. Completed application should be received before February 1 of the year of requested admission.

DEGREE OF DOCTOR OF JURISPRUDENCE

The degree of Doctor of Jurisprudence will be conferred upon candidates who complete, with the required average, six semesters of resident law study and who have 89 semester hours of credit, including all required courses. The required average is 2.0 and that average must be maintained on the work of all six semesters and also for the combined work of the grading periods in which the last 28 credit hours earned in residence were earned. Averages are computed on weighted grades. Grades are on an alphabetical scale from A+ to F. No credit toward the J.D. degree is awarded for grades of D- or F. New to the Admissions Office, The University of Tennessee, College of Law, 1505 W. Cumberland Ave., Knoxville, Tennessee 37996-1810. Completed application should be received before February 1 of the year of requested admission.

DEGREE OF DOCTOR OF JURISPRUDENCE

The degree of Doctor of Jurisprudence will be conferred upon candidates who complete, with the required average, six semesters of resident law study and who have 89 semester hours of credit, including all required courses. The required average is 2.0 and that average must be maintained on the work of all six semesters and also for the combined work of the grading periods in which the last 28 credit hours earned in residence were earned. Averages are computed on weighted grades. Grades are on an alphabetical scale from A+ to F. No credit toward the J.D. degree is awarded for grades of D- or F. New to the Admissions Office, The University of Tennessee, College of Law, 1505 W. Cumberland Ave., Knoxville, Tennessee 37996-1810. Completed application should be received before February 1 of the year of requested admission.

DEGREE OF DOCTOR OF JURISPRUDENCE

The degree of Doctor of Jurisprudence will be conferred upon candidates who complete, with the required average, six semesters of resident law study and who have 89 semester hours of credit, including all required courses. The required average is 2.0 and that average must be maintained on the work of all six semesters and also for the combined work of the grading periods in which the last 28 credit hours earned in residence were earned. Averages are computed on weighted grades. Grades are on an alphabetical scale from A+ to F. No credit toward the J.D. degree is awarded for grades of D- or F. New to the Admissions Office, The University of Tennessee, College of Law, 1505 W. Cumberland Ave., Knoxville, Tennessee 37996-1810. Completed application should be received before February 1 of the year of requested admission.

DEGREE OF DOCTOR OF JURISPRUDENCE

The degree of Doctor of Jurisprudence will be conferred upon candidates who complete, with the required average, six semesters of resident law study and who have 89 semester hours of credit, including all required courses. The required average is 2.0 and that average must be maintained on the work of all six semesters and also for the combined work of the grading periods in which the last 28 credit hours earned in residence were earned. Averages are computed on weighted grades. Grades are on an alphabetical scale from A+ to F. No credit toward the J.D. degree is awarded for grades of D- or F. New to the Admissions Office, The University of Tennessee, College of Law, 1505 W. Cumberland Ave., Knoxville, Tennessee 37996-1810. Completed application should be received before February 1 of the year of requested admission.

DEGREE OF DOCTOR OF JURISPRUDENCE

The degree of Doctor of Jurisprudence will be conferred upon candidates who complete, with the required average, six semesters of resident law study and who have 89 semester hours of credit, including all required courses. The required average is 2.0 and that average must be maintained on the work of all six semesters and also for the combined work of the grading periods in which the last 28 credit hours earned in residence were earned. Averages are computed on weighted grades. Grades are on an alphabetical scale from A+ to F. No credit toward the J.D. degree is awarded for grades of D- or F. New to the Admissions Office, The University of Tennessee, College of Law, 1505 W. Cumberland Ave., Knoxville, Tennessee 37996-1810. Completed application should be received before February 1 of the year of requested admission.

DEGREE OF DOCTOR OF JURISPRUDENCE

The degree of Doctor of Jurisprudence will be conferred upon candidates who complete, with the required average, six semesters of resident law study and who have 89 semester hours of credit, including all required courses. The required average is 2.0 and that average must be maintained on the work of all six semesters and also for the combined work of the grading periods in which the last 28 credit hours earned in residence were earned. Averages are computed on weighted grades. Grades are on an alphabetical scale from A+ to F. No credit toward the J.D. degree is awarded for grades of D- or F. New to the Admissions Office, The University of Tennessee, College of Law, 1505 W. Cumberland Ave., Knoxville, Tennessee 37996-1810. Completed application should be received before February 1 of the year of requested admission.

DEGREE OF DOCTOR OF JURISPRUDENCE

The degree of Doctor of Jurisprudence will be conferred upon candidates who complete, with the required average, six semesters of resident law study and who have 89 semester hours of credit, including all required courses. The required average is 2.0 and that average must be maintained on the work of all six semesters and also for the combined work of the grading periods in which the last 28 credit hours earned in residence were earned. Averages are computed on weighted grades. Grades are on an alphabetical scale from A+ to F. No credit toward the J.D. degree is awarded for grades of D- or F. New to the Admissions Office, The University of Tennessee, College of Law, 1505 W. Cumberland Ave., Knoxville, Tennessee 37996-1810. Completed application should be received before February 1 of the year of requested admission.
the College of Business Administration. Three of the 9 semester hours must be earned in Accounting 501, 503, or a more advanced accounting course.

The College of Business Administration will award credit toward the MBA for acceptable performance in a maximum of 9 semester hours of approved courses offered by the College of Law.

Because while completing the first year courses in the College of Law, students are encouraged to maximize the integrative facets of the dual program by taking courses in both colleges each year.

**Awarding of Grades**

For grade recording purposes in the College of Law for graduate business courses and in the College of Business Administration for law school courses, grades awarded will be converted to either Satisfactory or No Credit and will not be included in the computation of the student's average grade or class standing in the college where such grades are so converted. The College of Law will award a grade of Satisfactory for a graduate business course in which the student has earned a B grade or higher and a No Credit for any lower grade. The College of Business Administration will award a grade of Satisfactory for a College of Law course in which the student has earned a C+ grade or higher and a No Credit for any lower grade. Grades earned in courses of either college may be used on a regular graded basis for any appropriate purpose in the college offering the course. The official academic record of the student maintained by the Registrar of the University shall show the actual grade assigned by the instructor without conversion.

**Non-Law Elective Course Credit**

Students enrolled in the J.D.-MBA degree program may not receive credit towards the J.D. degree for courses taken in other departments of the University except for those taken in conjunction with the dual program.

Students are advised to consult the Graduate School for the requirements for both the J.D. and the M.P.A. degrees, as well as the requirements for the dual program. The College of Law will award a maximum of 9 semester hours of credit toward the J.D. degree for successful completion of approved graduate level courses (500 or 600 level) offered in the Department of Political Science. The M.P.A. program will award a maximum of 9 semester hours of credit toward the M.P.A. degree for successful completion of approved courses offered in the College of Law. All courses for which such cross-credit is awarded must be approved by the J.D.-M.P.A. coordinators in the College of Law and the Department of Political Science. All candidates for the J.D. degree must successfully complete the requirements for the J.D. degree as stated in the front section of this catalog as well as the requirements for this college.

**DUAL J.D.-M.P.A. PROGRAM**

The College of Law and the Department of Political Science in the College of Arts and Sciences offer a coordinated dual degree program leading to the conferment of both the Doctor of Jurisprudence and Master of Public Administration degrees. In this program, a student may earn the M.P.A. and J.D. degrees in about four years rather than the five years that otherwise would be required. Students pursuing the dual degree program should plan to be enrolled in coursework or an internship for one summer term in addition to taking normal course loads for four academic years.

**Admission**

Applicants for the J.D.-M.P.A. program must make separate application to, and be independently accepted by, the College of Law for the J.D. degree and the Department of Political Science and The Graduate School for the M.P.A. degree. Applicants must also be accepted by the Dual Degree Committee. All applicants must submit a Law School Admission Test (LSAT) score. An applicant's LSAT score may be substituted for the Graduate Record Examination (GRE) score, which is normally required for admission to the M.P.A. program. Application may be made prior to or after matriculation in either the J.D. or the M.P.A. program, but application to the dual program must be made prior to entry into the last 29 semester hours required for the J.D. degree and prior to entry into the last 15 hours required for the M.P.A. degree.

**Curriculum**

A dual degree candidate must satisfy the requirements for both the J.D. and the M.P.A. degrees, as well as the requirements for the dual program. The College of Law will award a maximum of 9 semester hours of credit toward the J.D. degree for successful completion of approved graduate level courses (500 or 600 level) offered in the Department of Political Science. The M.P.A. program will award a maximum of 9 semester hours of credit toward the M.P.A. degree for successful completion of approved courses offered in the College of Law. All courses for which such cross-credit is awarded must be approved by the J.D.-M.P.A. coordinators in the College of Law and the Department of Political Science. All candidates for the J.D. degree must successfully complete the requirements for the J.D. degree as stated in the front section of this catalog as well as the requirements for this college. 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.

**Professional Courses**

801 Civil Procedure I (3) Binding effect of judgments, selecting proper court (jurisdiction and venue), ascertainability of 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. Introduction to relevant portions of Article 2 of the Uniform Commercial Code.

804 Contracts II (3) Continuation of Contracts I. Issues arising in contract formation: interpretation of good faith; conditions, impracticability and frustration of purpose; remedies; third party beneficiaries; assignment and delegation. Consideration of usage 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 operators 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 severable 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, 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, possessory rights, and encumbrances; 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 the law, and constitutional protection of individual liberties and civil rights.

813 Evidence (4) Rules regulating introduction and exclusion of oral, written and demonstrative evidence at trials and other proceedings, including relevance, competence, impeachment, parol evidence, privilege, expert testimony, authentication, and judicial notice. Coreq: 920 for students electing concentration in advocacy.

814 Legal Profession (3) Legal, professional and ethical standards applicable to lawyers. Not open to students who have taken 815.

815 Introduction to Advocacy and Professional Responsibility (3) Theory and morality of advocacy in adversarial system, and legal, ethical, and professional standards applicable to lawyers and especially lawyers as advocates.

816 Fundamental Concepts of Income Taxation (3) Introduction to the basic principles of federal individual income tax and the tax setting concerns that arise in practice. Federal concept of gross income, tax-exempt income, exclusions, deductions and standard of living costs; income tax problems 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 rule-making (attention to federal Administrative Procedure 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.

824 Local Government (3) Distribution of power between state and local governmental units; sources of authority for limitations on local government operations; creation of local boundaries; home rule; problems created by fragmentation of local government units; financing of local services; influence of federal programs on local government finance and decision-making.


827 Business Associations (4) Legal problems associated with formation, operation, and dissolution of incorporated and unincorporated business firms; rights of fiduciaries and employees; operation of limited liability companies, and corporation shareholders, directors, and officers; and officers with whom members interact in connection with firm's business.

826 Corporate Finance (3) Corporate finance in connection with current financial development; interaction of capital markets with financial markets; use of debt and various types of equity securities, distributions to shareholders, mergers and other corporate acquisitions. Legal evaluation of corporate securities.

820 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-hold companies; litigation under Rule 10b-5 and other antitrust provisions; and provision of legal and other professional services in connection with securities transactions. Recommended preq or coreq: 827.

833 Representing Enterprises (3-5) Capstone course for concentration in business transactions. Simulated business transactions involving planning and implementation of corporate reorganization. Topics include negotiations, drafting, and court trials for concentration in business transactions.

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), bank collections, letters of credit, leases, sales, and credit sale, including sales of goods, leases, condominium interests, and sale of services not covered in Commercial Law. Preq: 840.

842 Contract Drafting Seminar (2) Practical fundamental of drafting contracts of different types.

843 Debtor-Creditor Law (3) Basic elements of federal bankruptcy law, the extent of the automatic stay, trustee's avoidance powers, assumption and rejection 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. Specific course offerings vary. Subjects include: constitutional structure of American governmental institutions; federalism, separation of governmental powers; relationship between legislative and executive branches, relationship among states and between states and federal government, and constitutional amendment process; state constitutional law, Tennessee constitution and differences between state and federal constitutional law; Bill of Rights and 14th Amendment to Constitution; constitutional rights as protected by Bill of Rights and 14th Amendment. Preq: 812. May be repeated under different topic.

846 Civil Rights Actions (3) Litigation to secure constitutional rights in private actions against the government and its officials, as well as rights protected by other civil rights legislation: elements of cause of action under 42 U.S.C. § 1983; 1983 immunity and liability of federal officials under the Eleventh Amendment; institutional and individual immunities; relationship 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 social and economic 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 Criminal Procedure I (3) Police practices and constitutional rights of persons charged with crimes: arrest; search and seizure; identification; interrogation and confession; electronic eavesdropping; and right to counsel.

855 Criminal Procedure II (3) Pre- and post-trial procedures in a criminal case: bail; preliminary hearing; grand jury; prosecutorial discretion; discovery; speedy trial; plea bargaining; jury trial; double jeopardy; and postconviction relief. Federal Rules of Criminal Procedure.

859 Criminal Law Seminar (2) Advanced problems in criminal law and administration of justice. Preq: 809.

862 Family Law (3) Survey of laws affecting family relationships: premarital agreements; 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 and parents, and between state, juvenile justice, foster care, adoption; educational systems; 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 legal system to environmental problems: environmental litigation; Clean Air Act; Clean Water Act; National Environmental Policy Act; and selected regulatory issues.

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 positivism; natural law theory; legal realism; idealism; historical jurisprudence; utilitarianism; Kantianism; sociological jurisprudence; policy science; and legal studies.

879 Law and Economics (3) Relationship between legal and economic thought; application of basic economic concepts to legal problems; economics in legal decision-making; scholarly and public 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 critical faculty, and writing 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 (3) Legal status of persons abroad; acquisition and use of property within a foreign country; doing business abroad as a foreign corporation; engaging in business within a foreign country; expropriation or annulment of contracts or concessions.

889 International Law Seminar (2) Current international law problems. Preq: 886 or 887.

895 Labor Relations (3) Political, social and economic influences in development of federal labor relations law; organization and employer unfair labor practices; strikes, lockouts, boycotts, and collective bargaining processes; enforcement of collective agreements; individual rights of employees; federal preemption and state regulation.

896 Employment Law (3) Legal regulation of employment relationships: social, legal and economic influences in employee-employer relationship; employment discrimination; legally prescribed minimum standards of compensation and safety; restrictions on termination of employment; regulation of retirement systems.

899 Labor Relations Seminar (2) Arbitration of labor agree-ments: judicial and legislative developments; nature of process; relationship to collective bargaining; selected arbitration problems on various topics under collective agreements; role of lawyers and arbitrators. Preq: 895.

909 Labor Relations (3) Selected labor relation problems. Preq: 895.

909 Advocacy Clinic (6) Supervised fieldwork requiring students to assume substantial responsibility for representing clients with various civil and criminal legal problems. Emphasis is on providing substantive and procedural advice to clients, serving as mediators in general sessions court and other settings; mediation ethics, relationship of mediation to other dispute 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; conflicts between federal and state judicial systems.

918 Remedies (4) Judicial remedies: damages, restitution, and equitable relief; availability, limitation and measurement of various remedies; comparison of contract, tort and property-related remedies.

920 Trial Practice (3) Litigation through simulation, trial problems and preparation; basic trial strategy, professional responsibility; fact investigation and witness preparation; discovery and presentation of evidence; selection and instruction of jurors; opening and closing arguments; interrogatories and depositions. Coreq: 813 for students electing concentration in advocacy. Prereq: 813 for all other students.

921 Pre-Trial Litigation (3) Civil pre-trial process. Drafting of actual pre-trial documents in civil cases: complaint, motions for preliminary injunction, class certification papers, motions to dismiss and for summary judgment, and various discovery papers.

922 Advanced Trial Advocacy (3) Study and development of trial skills: trial preparation, advanced direct and cross-examination, expert witnesses, jury selection, jury instruction, technology in courtroom, and motion practice. Prereq: 813.

923 Complex Litigation (3) Advanced civil procedure dealing with special problems that arise in litigation involving multiple claims and multiple parties; permissive and compulsory joinder; intervention; disposition of duplicative or concurrent actions; discovery in large cases; judicial control of complex litigation; res judicata and collateral estoppel problems.

925 Appellate Practice Seminar (2) Federal and Tennessee Rules of Appellate Procedure, local rules of federal circuits; recent completerecordsofseveralUnitedStatesSupreme Court cases and preparation of an appellate brief based on record of actual case.

927 Interviewing, Counseling and Negotiation (3) Development of conceptual and practical frameworks for understanding interviewing, counseling and negotiation, and lawyer's role in tasks. Readings of different methods, strategies and perspectives from recent literature involving lawyering skills. Simulations and videotape critiques; drafting of documents. Relevant 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 case development and management; interviewing, counseling and negotiation; ways of resolving disputes without litigation. Not open to students who have taken 927.

929 Teaching Clients the Law (3) Communication of law as basis for decision by individuals and organizations. Development of skills by teaching-practical law course to high school or adult students and by writing research papers that synthesize Tennessee or federal law in plain language.

935 Gratuitous Transfers (4) Nature, creation, termination, and modification of trusts; fiduciary administration; intestate succession; execution, revocation, probate and contest of wills; creation and construction of various types of future interests; construction of limitations; application of the rule against perpetuities.


940 Land Finance Law (3) Financing devices: mortgages, deeds of trust and land contracts; problems of priorities; transfer of secured interests when debt assumed; foreclosure; mechanics of satisfaction; security interest; default, exercise of equity of redemption and/or 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 (2) Simulated representation of various parties: sellers, buyers, construction lenders, permanent lenders, architects, contractors, subcontractors and consultants, in development of real estate project. Negotiation and drafting of documents essential to large commercial development. Prereq: 813.

943 Land Use Law (3) Private land use controls: nuisance, easements, real covenants, equitable servitudes and homeowner associations; public land use controls: zoning, subdivision controls, eminent domain, and regulatory takings. Prereq: 940.

950 Computers and Law (3) Impact of computers on law and practice of law: expert systems; legal skills required in building expert systems; common law uses of computers and computerized research. Preparation of lawyers to think effectively and use computers. Prior computer experience not necessary.

956 Women and the Law (3) Treatment of status and rights of women in American legal system: race 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.

969 Intellectual Property (3) Intellectual property and related interests under federal and state law: trademarks; trade secrets; copyright; right of publicity; unfair competition.

972 Taxation of Business Organizations (3) Survey and analysis of federal income taxation of partnerships, subchapter C corporations, and limited liability companies; introduction to transaction analysis and business planning. Required written exercises: drafting of portions of partnership agreements, opinion letters and legal memoranda. Prereq: 918.

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.

974 Income Taxation of Business Organizations (3) Survey and comparative analysis of business organizations: taxation of income, sales, and excise taxes; income, franchise, and gross receipts taxes; taxation of corporations and partnerships. Prereq: 972.

975 Tax Theory (3) Method and purposes of governmental revenue collection through examination of economic and political theory; comparative analysis of various tax systems and proposed reforms of taxation; income tax, consumption tax, sales tax, social security tax, and value-added tax. Required preparation of expository essay on selected issues of tax theory chosen by student. Limited enrollment.

976 Tax Planning (3) Advanced study of taxation of business organizations. Tax planning for financially troubled entities, and review of recent transactions involving cutting-edge tax planning and shaping changes in law. Prereq: 972, 818 and 872.

980 Insurance (3) Types of insurance: life, property, health, accident and liability insurance; regulation of insurance industry; insurance contracts, insurance policy provisions, standardization and interpretation, representation, and warranties, and exclusions; insurance and reinsurance; duties of agents; excess liability, subrogation; and bad faith actions against insurers. Insurance law and insurance defense: duties to defend, notice and cooperation issues, and conflicts of interest.

983 Products Liability (3) Scope of duty and theories of recovery: potential plaintiffs and defendants; statutory and contractual limitations on recovery; damages; causation; and defenses.

985 Social Legislation (3) Systems other than traditional tort remedies for compensating victims of work-related accidents and disabilities, and for compensating disabled persons. Worker’s compensation; requirements for covered employer-employee relationship; accidental injuries and occupational diseases arising out of and in course of employment; causation; nature of medical, disability, and death benefits; exclusiveness of compensation relief; employer and co-employees; and rights and liabilities of non-employees; administration and procedural aspects of Workers’ Compensation practice; and various law reform measures. Brief introduction to and sampling of cases involving Social Security disability claims.

990 Issues in the Law (3) Selected topics. May be repeated.

991 Issues in the Law Seminar (2) Selected topics. May be repeated.

992 Directed Research (1-2) Independent research and writing under direct supervision of faculty member. Prereq: 904 or 906. Must be approved by supervising faculty member and by the dean of the dean’s designee. Maximum of one each semester during last two years of study. Prereq: Second-year standing.

994 Independent Study (1-4) Independent study under direct supervision of faculty member. Prereq: 904 or 906. Must be approved by supervising faculty member and by the dean of the dean’s designee. Maximum of one each semester during last three semesters of study.

996 Law Review (1) Performance of duties as staff editor of Tennessee Law Review. Responsibilities vary each semester as specified in Tennessee Law Review Policy Manual, writing of case notes, comment or article, and/or performance of other assigned duties related to operations of Tennessee Law Review. Completion of potentially publishable comment or article for Tennessee Law Review subject to faculty review and approval. May be repeated. S/NC only. (Does not count toward total number of elective upper division courses taken S/NC.)

997 Moot Court (1) Participation as member of faculty-supervised intercollegiate moot court competition. May be repeated. S/NC only. (Will not count toward total number of elective upper division courses taken S/NC.)

998 Planning and Drafting Project (1) Preparation and completion of planning and drafting project under faculty supervision in conjunction with case studies in the practice of law. May be repeated. S/NC only. (Does not count toward total number of elective upper division courses taken S/NC.)

999 Independent Study (1-4) Independent study under direct supervision of faculty member. Prereq: 904 or 906. Must be approved by supervising faculty member and by the dean of the dean’s designee. Maximum of one each semester during last three semesters of study. (Does not count toward total number of elective upper division courses taken S/NC.)

Leadership Studies in Education

(College of Education)

MAJORS

DEGREES

College Student Personnel .................. M.S.
Education ................................... Ed.S., Ed.D., Ph.D.
Leadership Studies in Education ................. M.S.

Jeff Aper, Leader

Professors:

Bogue, Grady, Ed.D. .................. Memphis State
Kendall-Melton, Robbie, Ph.D. ............ Michigan
McInnis, Malcolm, Ph.D. .................. Florida State
Mertz, Norma T., Ed.D .................. Columbia
Ouben, Gerald C., Ph.D. .................. Minnesota

Associate Professors:

Aper, Jeffery P., Liaison, Ph.D. ............... VPI
The Leadership Studies in Education unit participates in graduate programs leading to degrees, masters, and concentrations in:

Master of Science
Leadership Studies in Education
Educational administration and supervision

College Student Personnel
Specialist in Education
Education
Educational administration and supervision

Doctor of Education
Education
Leadership studies (educational administration and supervision; higher education)

Doctor of Philosophy
Education
Educational administration and supervision/higher education

See Education under Fields of instruction for full description of all degree requirements. The Leadership Studies unit focuses on the preparation and development of administrative and instructional leaders who will serve in diverse settings of schools and colleges, community and human service agencies, and continuing education organizations, and educational units of government and corporate organizations.

The unit offers an alternative approach to residence for the Doctor of Education degree program. This alternative residence involves, among other requirements, a two-year, on-campus, continuous enrollment in Leadership Studies 606, Leadership Forum. Interested students should contact the unit for further information.

The annual admission deadline is March 15 for the Ed.S. and doctoral programs, and November 1 and March 15 for the master's program.

ADMISSION REQUIREMENTS

General test of the Graduate Record Examination; writing sample if GRE verbal is below 50th percentile; leadership potential judged by activities in organizations; and rating forms or letters of recommendation. The Ed.D. applicant must also interview with all faculty members on campus or elsewhere.

Educational Administration and Supervision

GRADUATE COURSES

513 Administrative and Organizational Theory in Education (3) Introduction to theoretical administrative and organizational foundations of management and leadership of educational programs and institutions. F, Su

515 Human Relations and Communication in Administration (3) Development and use of effective interpersonal communication skills and channels, intergroup relations, supportive work climates, personnel motivation, conflict management skills, and role of values, attitudes, and expectations in administration. F, Su

516 Research for School Administrators (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. Sp, Su

529 Politics of Education and Educational Environments (3) School/community relations in political context of modern, mass society. Administrative and supervisory competencies: political, social, economic, cultural, and racial environments in which schools operate. Prereq: M.S. introductory core or consent of instructor. F, Su

535 Administrative Applications of Micro Computers (3) DOS, word processing, data management, spread sheets, and computer communications. Review and development of specific administrative applications: scheduling, attendance, student record systems, and accounting. F, Su

544 School Finance and Business Management (3) For prospective building level administrators. Financial and logical management tasks and procedures in individual school setting. Prereq: M.S. introductory core or consent of instructor. F, Su

547 Educational Facility Planning (3) Concepts and skills for development, evaluation, construction, renovation, maintenance, and operations of quality educational environments and facilities. Prereq: M.S. introductory core or consent of instructor. Sp, Su

548 Introductory Supervision and Personnel (3) Basic supervisory and personnel concepts and related competencies: building and maintaining trust-based relationships; interviewing, personnel planning, and managing employee information, supervision of instructional and non-instructional personnel, student supervision, staff evaluation, and staff development. Prereq: Introductory M.S. core or consent of instructor. Sp, Su

553 Strategies of Educational Planning (3) Processes for improving decision-making function through use of both quantitative and qualitative planning techniques. Policy analysis, CPM, PERT, Delphi. Prereq: Introductory M.S. core or consent of instructor. F, Su

554 School Law (3) Logical arrangement of case and statutory materials for public school administrators and teachers; problems of changing law and public education. Prereq: M.S. introductory core or consent of instructor. Sp, Su

580 Internship in Educational Administration (3) Field experience in appropriate educational setting working directly with administrator. A total of planned program of study. Placement by department assignment. Some on-campus classes in conjunction with 583 or 582. Prereq: 21 hrs in educational administration and supervision or consent of instructor. F

582 Educational Leadership and District-Level (3) Role of central administrative team; relationships, behaviors, concepts and competencies for developing and maintaining effective school organizations and of planned program of study. Prereq: 21 hrs in educational administration and supervision or consent of instructor. F, Su

583 Educational Leadership-Principalship (3) Knowledge, skills, and relationships for principal as effective educational leader. Simulation materials and field-based activities. Culminating course with internships at end of planned course of study. Prereq: 21 hours in educational administration and supervision or consent of instructor. F

590 Special Topics (1-3) May be repeated. E

592 Field Problems in Educational Administration and Supervision (3) Topic to be assigned. May be repeated. S/N or letter grade. E

595 Elementary Principals Seminar (1-3) For in-service training of elementary school administrators. Development, programs, problems, and trends of elementary schools and management skills of elementary school administrators. Prereq: Presently elementary school administrator or consent of instructor. May be repeated. S/N or letter grade. F, Sp

596 Middle School Principals Seminar (1-3) For in-service training of middle school administrators. Development, programs, problems, and trends of middle school administration. Prereq: Presently middle school administrator or consent of instructor. May be repeated. S/N or letter grade. F, Sp

604 Seminar in Educational Administration and Supervision (1) Current educational issues, problems and research. Required two consecutive semesters during doctoral residency. May be repeated. S/N only. E

605 Advanced Seminar in Administrative Theory (3) Interdisciplinary seminar. Readings selected by faculty for research and scholarly value from early to current classical and contemporary studies and theoretical literature in administrative and organizational theory. Required of Ph.D. students in education. Prereq: Doctoral student in education.

610 Internship in Educational Administration (3) Opportunity for doctoral students and advanced graduate students to gain experience in performance of critical tasks of educational administration under supervision of practitioner and University representative. May be repeated at discretion of student's committee. Maximum 12 hrs. S/N only. E

614 Statistical Methods for School Administrators (3) Descriptive and experimental research methods, parametric and non-parametric statistical techniques used in research in educational settings. F

615 Research Designs (3) Statistical methods through multi-variate techniques and applications to various research designs. Prereq: 614 or consent of instructor. Sp

616 Research Methods (3) Overview of descriptive and experimental research design, data collection, analysis, and interpretation for survey studies and school surveys. Conduct of survey. Prereq: Basic statistics and computer skills or consent of instructor. E

629 Seminar in Political Education (3) Political theories and practices as they affect operation of public school systems and higher educational institutions. Interdisciplinary discussions of community power structures, special interest groups, based on literature and research from education, sociology, and political science. Field inquiry. Prereq: 528, 518 or equivalent or consent of instructor. F

644 Educational Finance and Business Management (3) Contemporary educational finance policies and their influence upon education, nation and citizens. Superintendence team concept, management of school financial services. Prereq: 544 or consent of instructor. F, Su

646 School Personnel Administration (3) Personnel administration functions for professional and supporting staff in educational organizations. Recruitment, selection, placement, personnel policies, employee wage and salary administration, fringe benefits, collective negotiations, human relations, staff development, and staff evaluation. Prereq: 546 or consent of instructor. F, Su

655 State-Federal Relations in Education (3) Interrelationships between federal, state, and local responsibilities and organization for education by analysis of traditional, political, fiscal and functional aspects of educational partnerships. Funding partnerships; discussion of grant proposal development processes. Sp, Su

656 Legal Foundations of Public Education (3) School law; constitutional foundations as they relate to public education at state and local levels. F, Su

658 Conflict Management (3) Social conflict and its management. Causes of interpersonal, intergroup, and organizational conflict, and strategies used to manage conflict, conflict management models associated with different sectors of human activity, and current organizational practices for managing destructive conflict. F

670 Values and Ethics In Educational Leadership (3) Examination of moral and ethical dimensions of work of educational administrators; assistance to current and prospective administrators to think with dimensions in knowledgeable, reflective and principled ways. (Same as Higher Education 670.)

680 Administration of Complex Organizations (3) Concepts and theoretical formulations to understand, analyze, evaluate, and change complex educational programs and organizations. Prereq: 513 or consent of instructor. Sp, Su

690 Special Topics (1-3) May be repeated. E

Higher Education

GRADUATE COURSES

530 Special Topics (1-3) May be repeated. E
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E


519 Educational Specialist Research and Thesis (3) May be repeated. P/NP only. E

593 Independent Study (1-3) May be repeated. S/NC or letter grade. E

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

606 Leadership Forum (2) Development of research, evaluation, policy analysis skills and critical analysis and evaluation of philosophical principles underlying American education. Continuous enrollment for 2 years. On-campus, for students in Ed.D. alternative residence program. May be repeated. Maximum 12 hrs. S/NC only.

693 Independent Study (1-3) May be repeated. S/NC or letter grade. E

Life Sciences

(College of Arts and Sciences)

MAJOR

DEGREES

Life Sciences .......................................................... M.S., Ph.D.

W.F. Harris, Chair

Coordinating Council:
Schwarz, O.J., Plant Physiology and Genetics
Harris, W.F., Biotechnology.

The programs leading to the M.S. and Ph.D. degrees in Life Sciences are interdepartmental and intercollegiate and are designed to augment offerings of individual departments in the following concentrations: biotechnology, (M.S. only), and plant physiology and genetics. Students interested in these areas should contact either the Life Sciences chairperson or the director of the area of interest. Each program is overseen by a committee and may have unique admission requirements.

ADMISSION REQUIREMENTS

1. A Bachelor's degree with a major in a biological, behavioral, or physical science.
2. GRE (general) scores.
3. Three letters of recommendation.
4. Coursework including a year of calculus (differential and integral), one year of chemistry, and a year of physics. Specific course deficiencies may be corrected during the first year.

DEGREE REQUIREMENTS

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. Within the biotechnology program only, a non-thesis M.S. option is available. Students choosing this option are expected to complete: (1) two summers' co-op experience in an appropriate industry. An evaluation by supervisor and a written report are required (592, Biotechnology Practicum Cooperative Experience, maximum 4 hrs.). (2) A written report in the form of a scientific paper in an area of specialization chosen by the student and advisor. The minimum requirements for the doctoral degree include at least 6 hours above the 600 level, 24 semester hours of course 600, a pattern of courses approved by the student's committee, a comprehensive examination, a doctoral dissertation, and a defense of dissertation. Individual programs may have additional requirements.

CONCENTRATIONS

Biology (M.S. only)

The biotechnology program will prepare students to participate in the wide variety of opportunities presented by the use of living cells and their components for the production of useful materials. This will be achieved at the M.S. level by a prescribed course of study of the biology and biochemistry of cells and molecules; by formal study of cells and of engineering aspects of biotechnology; and by the development of special expertise in areas such as animal embryo manipulation, automated chemical synthesis of macromolecules, bioprocess engineering, bioconversions and biotransformations, liposomes, microscopy and image processing, monoclonal antibodies and hybridoma technology, plant tissue culture, recombinant DNA technology and risk assessment and modeling. The production of a research thesis or demonstration of relevant experience plus an area of specialization will also be an important part of the training experience.

Required courses are Life Sciences 509, 511, 512, 531, 532; Biochemistry and Cellular and Molecular Biology 511; Microbiology 410; Botany 451; Chemical Engineering 475; and Ecology and Evolutionary Biology 507.

Plant Physiology and Genetics

This program provides the opportunity for intensive training and research experience in areas transcending the usual boundaries of plant sciences. It devotes itself to seeking solutions of problems concerning the interactions of physiology and genetics in applied and fundamental aspects of plant science.

Required courses are Life Sciences 510; Botany 521, 522; Biochemistry and Cellular and Molecular Biology 511, 512; Plant and Soil Science 471 or Ecology and Evolutionary Biology 580; Plant and Soil Science 552; Microbiology 410.

GRADUATE COURSES

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

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

509 Biotechnology Seminar (1-2) Topics of importance to biotechnology. May be repeated. Maximum 6 hrs.

510 Special Topics in Life Sciences (1-3) Specializations in biotechnology, cellular, molecular, and developmental biology; environmental toxicology; athology; plant, physiology and genetics; and physiology. May be repeated. Maximum 9 hrs.

511 Advanced Cellular Biology (3) Cell structures and functions at molecular and supramolecular level. Membrane structure, function, and biogenesis; cellular communication; receptors and membrane flow; growth regulation and oncogenes; plant cell structure and function; connectivity and motility; mitosis and meiosis; blood and immune cells.

512 Advanced Molecular Biology (4) (Same as Biochemistry and Cellular and Molecular Biology 512.)
BUSINESS ADMINISTRATION CONCENTRATIONS

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


Minimum course requirements for management—Three courses from the following: 511, 521, 522, 531, 542, 551, 571, 581, 593.

Business Administration 510, 599. Selection must be approved by Management Department MBA advisor. For forest industries management—511, Forestry 560, 565.

For environmental management—581 plus two courses from the following list: Chemical Engineering 561; Economics 677, 678; Agricultural Economics 570; Sociology 560, 665; Law 866, 867; Geography 577. For manufacturing management—541, 542, Management Science 526, and an Industrial Engineering/Management Science course approved by designated faculty. Industrial Engineering 524 or Management Science 541 are recommended.

Additional courses may be accepted subject to approval by Management Department Chairperson or 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); additional one semester approved of doctoral seminar work. For strategic management—610, 611, 612, 613.

MINOR IN ENVIRONMENTAL POLICY

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

GRADUATE COURSES

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

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

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 Personnel Administration (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 R&D and development function and coordination with other functions. Management of scientists and engineers.

541 Operations Management I (3) Operations planning and control function. Application of models to real-world systems.

542 Operations Management II (3) Operations planning and control function. Application of models to real-world systems.

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 environmental factors and impact on internal and external factors on managerial decisions.

581 Environmental Management (3) Managerial frameworks for addressing environmental issues. Most pressing environmental challenges; options compatible with sustained business performance. Cases, field projects, research papers.

593 Directed Independent Study (1-3) Topic of mutual interest. Available only by prearrangement with supervising faculty member. May be repeated. Maximum 6 hrs. S/N or letter grade.

595 Selected Topics in Current Management Issues (3) In-depth consideration of current issues. Managerial impact of emerging topics. PreReq: Consent of Instructor.

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

601 Research Methods (3) Seminar covering broad range of issues: research process as applied to study of strategic management. Literature and examples of research. Research proposal.

610 Seminar in Advanced Organization Theory (3) Analysis of functioning of complex organizations. Classical and open systems models, organization growth and change, organizational effectiveness and design of complex organizations.

611 Seminar in Strategic Management I (3) Analysis of concepts and research in strategic management.

612 Seminar in Strategic Management II (3) Analysis of concepts and research in strategic management.

613 Seminar in Strategic Management III (3) Review and analysis of important books and monographs in strategic management. Understanding evolution of thought and emergence of distinct paradigms.

Management Science

(College of Business Administration)

MAJORS

Management Science..................... M.S., Ph.D.

M. M. Srinivasan, Chairperson

Committee Members:

Bowers, Melissa R., Management; Bozdag, Hamparsum, Statistics; Edirisinghe, Chanaka F., Management; Fowler, Oscar S., Management; Gilbert, Kenneth C., Management; Leithaker, Mary G., Statistics; Noon, Charles E., Management; Ramirez, Bruce A., Geography; Srinivasan, M. M., Management.

THE MASTER'S PROGRAM

The M.S. program in Management Science is designed as preparation for a career in the application of quantitative techniques for the solution of complex problems. The program's flexibility also makes it appropriate as preparation for doctoral study in Management Science.

Management Science coursework will expose students to both the theoretical development of quantitative techniques and their application to managerial decision making. In addition to the development of sufficient mathematical maturity for creative use of
quantitative skills, the program requires concentration 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

<table>
<thead>
<tr>
<th>Course Requirement</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Requirements</td>
<td>16</td>
</tr>
<tr>
<td>Management Science</td>
<td></td>
</tr>
<tr>
<td>531, 532, 533, 534, 691 or 692</td>
<td></td>
</tr>
<tr>
<td>Statistics</td>
<td>563</td>
</tr>
<tr>
<td>Electives</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
</tr>
</tbody>
</table>

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 an interdisciplinary program in a supporting area to qualify the graduate for a joint faculty position in the supporting area and management science. The candidate may choose from the business functional areas (accounting, finance, marketing, management, and transportation and logistics) or other disciplines, (e.g., computer science, forestry, ecology, and public administration);
3. to develop in the student, through coursework in mathematics, statistics and computer science, a high degree of mathematical maturity to enhance a potential career in management, research, or teaching.

Admission Requirements

The doctoral program requires three applicant recommendation forms and the GRE or GMAT, in addition to The Graduate School's requirements.

Coursework

A minimum of 48 semester hours of coursework taken for graduate credit (exclusive of thesis or dissertation) is required. Some of this may be the coursework from a master's program although a master's is not a prerequisite for the doctorate. The candidate must complete a minimum of 24 semester hours at The University of Tennessee, Knoxville, at least 6 of which must be at the 600 level. Both of these requirements are also exclusive of thesis or dissertation credits. Entering students who have completed graduate studies in applicable fields will be granted course credits for work which is equivalent to required courses in the program. The program includes approximately 16 to 20 semester hours of coursework in the applied area.

Qualifying Examinations

The student must demonstrate mastery of probability theory and statistical inference, Statistics 563, 564, by passing a written qualifying examination. Mastery of 12 to 14 semester hours in mathematics coursework must be demonstrated by passing a written qualifying examination. Topics normally include numerical analysis, either Mathematics 471, 472, 453, and 571, or 571-572, and real analysis, Mathematics 445-446. Other options may be approved. In exceptional circumstances, the faculty will consider waiving the mathematics and/or statistics qualifying examinations.

These requirements generally are completed by the end of the first year of the program. There is no foreign language requirement.

Comprehensive Examination

Prior to admission to candidacy for the degree, and normally after completion of the second year of the program, the student must pass a written comprehensive examination covering the theory of deterministic and stochastic management science models. Topics included in this examination are determined on an individual basis. Students will be expected to demonstrate an integrative ability that goes beyond simple mastery of course content.

Research and Dissertation

The student must complete 24 semester hours of Management Science 600: Doctoral Research and Dissertation, through which he/she is expected to make a significant contribution to the science. A final oral examination is conducted over the dissertation and such other segments of the program that the faculty committee deems appropriate. This effort, which is beyond the minimum 48 hours of coursework, normally is completed in the third year of the program.

ACADEMIC STANDARDS

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

PREREQUISITES FOR MANAGEMENT SCIENCE COURSES

The Management Science Program is interdisciplinary and students in other degree programs are encouraged to enroll in management science courses. Course prerequisites are designed to indicate the level at which courses are taught. Interested students whose prior coursework does not match the prerequisites are encouraged to seek the instructor's guidance and consent to enroll.

GRADUATE COURSES

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

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

526 Systems Modeling and Simulation (3) (Same as Industrial Engineering 526.)

531 Mathematical Programming (3) Linear programming solution procedures, duality, sensitivity, and parameter 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. Sp

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


593 Management Science Problems (1-6) Directed study on subject of mutual interest. E

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

621 Network Flows (3) Treatment of network optimization algorithms, transportation and transshipment models and primal-dual and primal-dual algorithms. 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.
Marketing, Logistics, and Transportation

(College of Business Administration)

MAJOR

DEGREES

Business Administration .......... MBA, Ph.D.

David W. Schumann, Head

Professors:

Barnaby, D. J., Ph.D. ................. Purdue
Cadotte, E. R., Ph.D. ............... Ohio State
Davis, F. W., Jr., Ph.D. .............. Michigan State
Dizer, G. N., DBA ......... Indiana
Frey, J. L. (Emeritus), Ph.D. ....... Florida
Hendrix, F. L. (Emeritus), Ph.D. ...
Ph.D. ......... North Carolina
Langley, C. J. (Dove Prof.), Ph.D. ... Penn State
Mentzer, J. T. (Harry J. Bruce Chair of Excellence), Ph.D. ... Michigan State
Mundy, R. A. (Taylor Prof.), Ph.D. ... Penn State
Schumann, D. W., Ph.D. .......... Missouri
Woodruff, R. B. (Prollitt's Prof.), DBA ... Indiana

Associate Professors:

Dabholkar, P. A. (Liaison), Ph.D. .. Georgia State
Foggin, J. H. (Liaison), DBA .... Indiana
Gardial, S. F., Ph.D. ............... Houston
Holcomb, M. C., Ph.D. ............ Tennessee
Reizenstein, R. C., Ph.D. ......... Cornell
Rentz, J. O., Ph.D. ............... Georgia

Assistant Professor:

Moon, M. A., Ph.D. ............... North Carolina

BUSINESS ADMINISTRATION CONCENTRATIONS

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

MBA Concentration: Logistics and Transportation, Marketing.

Minimum course requirements for logistics and transportation—501, 508, and one course from the following: 504, 506, 507, 593, and 599. For marketing—12 hours from the following courses: 601, 602, 603, 604, 605, 606.

Ph.D. Concentration: Logistics and Transportation, Marketing.

Minimum course requirements for logistics and transportation—12 hours to include 601, 602, 603. For marketing—12 hours from the following courses: 601, 602, 603, 604, 605, 606.

Marketing

GRADUATE COURSES

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

503 Buyer Behavior—Analysis for Marketing (3) Consumer behavior concepts and processes developed and applied to market analysis and design, and control of marketing programs. Social psychology and demographic factors that affect consumer product, brand, and patronage decisions. Prereq: Business Administration 504 and 505 or consent of instructor.

504 Analyzing Market Opportunity for Marketing Decisions (3) Major determinants of opportunity in markets, framework for finding markets and analyzing them for opportunity, application of market opportunity analysis to marketing strategy decisions. Prereq: Business Administration 504 and 505 or consent of instructor.

505 Marketing Research and Information Planning (3) Design of a rigorous marketing study from inception to implementation of results by recognizing key decision points and critically evaluating merit of research project. Prereq: Business Administration 504 and 505 or consent of instructor.

506 Marketing Strategy (3) Integration of conceptual and analytical skills from each component area of marketing formulation, research and experiential design, measurement, role of theory development and theory testing. Prereq: Business Administration 504 and 505 or consent of instructor.

507 Global Marketing (3) Strategic issues related to international and multinational marketing operations: identification and evaluation of opportunities in overseas markets; coordination of strategies in world markets. Prereq: Business Administration 504 and 505 or consent of instructor.

510 Principles of Marketing Management for Non-MBA Students (3) For students from other disciplines interested in obtaining knowledge of marketing disciplines at graduate level.

511 MBA Marketing Concentration I (6) Determination of customer value. Concepts of consumer behavior, marketing research, and building customer value. Prereq: Business Administration 504 and 505 or consent of instructor.

512 MBA Marketing Concentration II (6) Delivery of customer value. Communication of customer value, marketing strategy, and providing customer responsive organizations. Prereq: Business Administration 504 and 505 or consent of instructor.

593 Independent Study (3-6) Directed research and study. Prereq: Consent of instructor. May be repeated. E

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

601 Marketing Theory (3) Nature and scope of marketing, role of theory development and theory testing important to marketing research.

602 Research Methods (3) Research process: problem formulation, research and experimental design, measurement and implementation of results. Design: experimental design, survey research, and measurement.

603 Marketing Thought (3) Marketing literature across number of research areas. Evaluate individual works, determine state of research in each area, and identify areas that merit further study.

604 Seminar in Buyer Behavior Research (3) Behavioral study of people in roles as buyers and users of goods and services both individual and group processes.

606 Special Topics (3) Topics vary: marketing strategy, advanced consumer behavior, influence and persuasion theory and strategy, pricing issues, international marketing issues, and nonprofit organization marketing issues.

Logistics and Transportation

GRADUATE COURSES

501 Survey of Logistics and Transportation (3) U.S. logistics and transportation: physical, economic, social, and political environment; financing, managing, maintaining, and enhancing U.S. transport infrastructure.

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

504 Freight Carrier Systems and Management (3) Analysis of freight carrier management's efforts to provide services demanded by consumers in logistics and transportation marketplace.

506 Logistics Systems Management (3) Development of strategy for management of logistics systems. Executive level integration of logistics operations with marketing, production, and other decision areas. Practical applications through case approach and simulation game.

507 International Logistics and Transportation (3) Logistics strategy in the multi-national firm: materials management, international sources and distribution, and import/exporting. Issues: international carrier management, and management operations and comparative national transport systems analysis.

508 Executive-In-Residence Seminar in Logistics and Transportation Strategy (3) Capstone, integrative case course in logistics and transportation strategy participation in Executive-In-Residence Program.

593 Independent Study (3-6) Directed research and study. Prereq: Consent of instructor. May be repeated. E

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

601 Seminar in Logistics and Transportation Models (3) Analysis of contemporary models and methodologies in logistics and transportation research, topical coverage at discretion of instructor.

602 Seminar in Evolution of Logistics Thought (3) Traces evolution of logistics and transportation thought: dynamic development of principles and tools developed as organizational mission and environmental change. Economic and policy issues peculiar to transportation and other service organizations.

603 Research Methodology in Logistics and Transportation (3) Various research methods used in logistics and transportation. History and development of body of knowledge. Review of literature. Discussion of contemporary research issues. Development of student's dissertation research proposal.

Materials Science and Engineering

(College of Engineering)

MAJORS

DEGREES

Metallurgical Engineering .......... M.S., Ph.D.
Polymer Engineering ............... M.S., Ph.D.

Joseph E. Spruiell, Head

Professors:

Brooks, C. R., Ph.D. ............. Tennessee
Buchanan, Raymond A., Ph.D. .......... Vanderbilt
Clark, Edward S. (Emeritus), Ph.D. .... California
Fellers, J. F., Ph.D. .................... Akron
Law, P. K. (Racheff Chair of Emeritus), Ph.D. .......... Northwestern
Lowdeis, Douglas H., Ph.D. .......... Colorado
Lundin, Carl D., Ph.D. ................ Rensselaer
Oliver, Ben F., Ph.D. .................. Penn State
Pedrazza, A. J., Ph.D. ............... National (Argentina)
Phillips, Paul J., Ph.D. ............... Liverpool (UK)
Spruiell, Joseph E. (Liaison), Ph.D. .......... Tennessee
Stansbury, E. E. (Emeritus), Ph.D. .......... Cincinnati

Associate Professors:
Becker, William T., Ph.D. .......... Illinois
Benson, R. S., Ph.D. .................. Florida State
Meek, Thomas T., Ph.D. .......... Ohio State

Assistant Professor:
Kt, Kevin, Ph.D. ..................... Delaware

Graduate programs are offered leading to the degrees of Master of Science and Doctor of Philosophy in Metallurgical Engineering or Polymer Engineering. Both the metallurgical and polymer programs are flexible and interdisciplinary in nature. Students 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. Prospective students should consult materials science and engineering faculty concerning individual concentrations or special programs compatible with their backgrounds and goals.

Areas of concentration within the metallurgical engineering program include physical metallurgy, materials processing, welding metallurgy and materials joining; corrosion behavior; failure analysis; and mechanical and physical behavior of materials. Specializations in electronic and ceramic materials are available.

Areas of concentration within the polymer engineering program include rheology and polymer processing; polymer morphology; mechanical, physical and chemical behavior of polymers; and composite materials.

THE MASTER'S PROGRAM

Thesis Option

A total of 36 semester hours is required for the M.S. degree in either Metallurgical Engineering or Polymer Engineering. Additional requirements include:

1. A major consisting of 12 to 18 semester hours of graduate courses in metallurgical engineering or polymer engineering. The polymer engineering program must include 540, 541, 543, 546, 549, and 572 unless similar material has been covered in prior coursework.

2. Additional courses amounting to 6 to 12 hours total in any approved engineering, chemistry, mathematics, physics, or other related fields.


All resident students are required to register for and participate in the graduate seminar in metallurgical engineering or polymer engineering, as appropriate, during each semester in which it is offered. Credits for the seminar do not count towards satisfying the coursework requirements.

Non-Thesis Option

Under certain conditions, a candidate may apply for a non-thesis option. To be eligible, the 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. A departmental faculty meeting will consider each application individually. Upon acceptance, a supervisory committee of three will be appointed, at least two being from the Department of Materials Science and Engineering. The requirements for completion of the non-thesis option are as follows:

1. A total of at least 36 hours in graduate courses in metallurgical engineering, polymer engineering and related areas. The minimum requirements are 21 hours in the Department of Materials Science and Engineering and up to 12 hours in other engineering or science courses. The candidate's degree program must be approved by the faculty committee.

2. Satisfactory completion of a critical review of the literature in an area related to metallurgical, polymer or materials engineering (580).

3. Satisfactory performance in an oral examination to be conducted by the faculty committee and covering the review paper and other areas of metallurgical or polymer engineering.

THE DOCTORAL PROGRAM

Students applying for entrance into the doctoral program must display concrete evidence of ability to perform and report independent research to the satisfaction of the department. The candidate's doctoral thesis may be offered as such evidence.

Department requirements consist of the following:

1. Graduate courses in materials science and engineering totaling at least 24 semester hours, with at least 6 of which must be in 600 series courses.

2. Supporting courses in related scientific and engineering fields totaling at least 24 semester hours, subject to approval by the student's faculty committee. These related fields will normally include chemistry, mathematics, physics, and engineering.

3. Three comprehensive examinations, 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, and chemistry.

4. Active participation in graduate seminars conducted by the department. Resident students must register for the appropriate 503 or 504 every semester offered.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The Ph.D. program in Metallurgical Engineering is available to residents of the state of Virginia; the M.S. and Ph.D. programs in Polymer Engineering are available to residents of Kentucky, or Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.
523 Plastic Deformation of Metals (3) Geometry and mechanisms of single crystal plastic deformation, slip, twinning, and cleavage, work hardening, effect of temper-ature, leading to fracture; effect of ordering and second phase alloying; polycrystalline behavior in terms of single crystal deformation mechanisms; texture for-mation. Prereq: 301, 320 or consent of instructor.

524 Metallurgical Thermodynamics (3) Applications of chemical thermodynamics to metallurgical problems: refining, oxidation, surface treatments, alloy systems. Prereq: 570 or equivalent.

525-26 Welding Metallurgy (3,3) Welding processes: physical metallurgy of welding; phase transformations; heat flow; residual stress. Theoretical basis of welding, welding cracking and porosity formation; applications to process utilization.

528 Ceramic Matrix Composites: Material and Mechani-cisms (3) Same as Engineering Science 528.

529 Diffusion in Solids (3) Phenomenology and atomic mechanisms of diffusion in solid state. Solution and applications of diffusion equations; random walk problem and mechanisms of diffusion; diffusion in dilute and concentrated alloys; Kirkendall effect; high diffusivity paths.

530 Phase Transformations in Metallic Materials (3) Thermodynamics of phase equilibria; theory of nucleation in solids; kinetics and morphology of diffusion controlled growth; kinetics of interface controlled phase transformations; nucleation and growth of martensitic transformations.

531 Advanced Corrosion (3) Analyses of corrosion processes in terms of polarization measurements and Pourbaix diagram. Influence of environmental and me-chanical factors contributing to pitting, crevice, fretting, wear, fatigue and stress corrosion. Prereq: 470 or consent of instructor.


540 Basic Polymer Chemistry (3) Synthesis, reactions and degradation of polymers. Molecular characterization: solution methods and spectroscopy. Prereq: Semester of organic chemistry and thermodynamics or equivalent.

541 Fluid Mechanics and Polymer Processing (3) Navier-Stokes equations and illustrative problems; applications in chemical engineering and polymer engineering: packed and fluidized beds, multiphase systems. Basic concepts in rheology; applications in polymer processing: screw extrusion, fiber spinning, injection molding. (Same as Chemical Engineering 541.)

542 Further Topics in Polymer Processing (3) Description and analysis of selected polymer processing operations. Prereq: 541.


544 Polymer Solution Thermodynamics and Character-ization (3) Theories of solutions, statistical thermody-namics, characterization of chromatography, viscosity, light scattering 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 and nonlinear elasticity; dynamic mechanical behavior and testing; loss tangent; experimental methods. Introduction to mechanical properties of polymeric composites.

549-50 Laboratory Methods in Polymer Engineering (1,2) Basic experimental techniques and instrumentation associated with characterization, x-ray and light scattering, calorimetry, rheometry, mechanical properties of solid polymers; polymer processing operations. Coreq: 540 or consent of instructor. 549/549-NIC only.

560 Principles of Ceramic Processing (3) Treatment of ceramic processing; raw materials preparation and characterization; powder consolidation; diey, firing, sintering techniques, mechanisms and kinetics. Prereq: 360 or equivalent.

561 Inorganic Glass Forming Systems (3) Physical and chemical nature of inorganic glasses, structural theories of glass formation; major glass forming systems: silica, other oxide glasses, nitrate glasses, water glasses, and chalcogenide glasses. Prereq: Chemical Engineering 371.

562 Experimental Mechanics of Composite Materials (3) (Same as Engineering Science 562.)

571 Electron Microscopy (3) Operation of electron microscope; kinematical and dynamical diffraction theoreti-cies; structure determination; analysis of lattice defects. Prereq: 405 or equivalent.

572 X-Ray Diffraction (3) Symmetry of crystals, space group theory, reciprocal lattice and applications to defective structures; powder and single crystal x-ray techniques; introduction to crystal structure determina-tion; characterization of orientation; application to inor-ganic, metallic and polymer structures.

574 Formability of Materials (3) Modeling and analysis of plastic strain with application to primary and secondary forming operations; thin film and noncrystalline materials; flow localization, instability, predictive testing. Prereq: Consent of instructor.

576 Special Topics in Materials Science and Engineering (3) Topics of current significance and interest. Prereq: Consent of instructor. May be repeated.


800 Doctoral Research and Dissertation (1-15) For graduate students working on the dissertation. Prereq: Consent of instructor. May be repeated.

821-22 Theoretical Metallurgy (3,3) Topics in solid state physics as applied to materials science; solidification, specific heats, electron theory of solids, electrical and thermal conductivity, magnetic properties, theories of alloy formation. Prereq: Consent of instructor.

823-24 Solidification and Crystal Growth (3,3) Theories of solidification, fluid flow effects, magnetohydrodynamics of noncondensible fluids, growth morphology, thermodynamic applications, solidification theory, metallicity. Prereq: Consent of instructor.

841 Advanced Rheology and Viscoelastic Theory (3) Continuum mechanics, formulation of viscoelastic theories for describing deformation and flow of polymeric materials. Application to polymer processing problems. Recommended for MS candidates working in rheological areas. Prereq: 541.

842 Advanced Topics in Polymer Processing (3) Application of rheological behavior and structure development to analysis of polymer processing operations. Prereq: 541. (Same as Chemical Engineering 642.)

843 Phase Transformations in Polymers (3) Glass transition and glassy state; annealing of polymer glasses; crystalization of polymers; nucleation, growth and morphology; secondary nucleation theory; solidifi-cation of copolymers; crystallization under stress. Prereq: 543.

671 Quantitative Microscopy (3) Principal acoustic, optical, x-ray, electron and field-ion techniques for examination of microstructures of materials. Prereq: 405.

676 Advanced Topics in Materials Science and Engi-neering (3) Latest developments and/or advanced special topics. Prereq: Consent of Instructor. Many 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

MAJOR DEGREES

Mathematics M.M., M.S., Ph.D.,

Professors:

John B. Conway, Head

Alexiades, V., Ph.D. ...................... Delaware
Allikakos, N., Ph.D. .................... Brown
Anderson, D. F., Ph.D. ................. Chicago
Baker, G. A., Ph.D. ..................... Cornell
Bakley, John S. (Emeritus), Ph.D. .... Iowa
Carruth, J. H. (Emeritus), Ph.D. ......... Louisiana State
Clark, C. E. (Emeritus), Ph.D. ............ Wisconsin
Conway, J. B., Ph.D. .................... Louisiana State
Daverman, Robert J., Ph.D. .............. Wisconsin
Dobbs, D. E., Ph.D. ..................... Cornell
Dydyk, J., Ph.D. ......................... Warsaw
Frandsen, Henry, Ph.D. ................. Illinois
Gross, L. J., Ph.D. ....................... Missouri
Hinton, D. B., Ph.D. ..................... Tennessee
Hush, L. S., Ph.D. ....................... Florida State
Johansson, K., Ph.D. .................... Bielefeld
Jordan, G. Samuel, Ph.D. ............... Wisconsin
Karakashian, O., Ph.D. .................. Harvard
Kuperman, B. A. (UTSI), Ph.D. .......... MIT
Lenthart, S., Ph.D. ....................... Kentucky
McConnon, R. M., Ph.D. ................ Duke
Mathews, H. T. (Emeritus), Ph.D. ....... Tulane
Miller, D. D. (Emeritus), Ph.D. ......... Michigan
Reajut, B. S., Ph.D. ...................... Illinois
Reddy, K. C. (UTSI), Ph.D. ............. Indian IT
Rosenkranz, J., Ph.D. ................... Wroclaw
Schaefer, P. W., Ph.D. ................... Maryland
Serbin, Steve, Ph.D. ..................... Cornell
Simpson, H., Ph.D. ....................... Cal Tech
Soni, K. (Emeritus), Ph.D. ............... Oregon State
Soni, P. R., Ph.D. ......................... Oregon State
Stallman, F. W. (Emeritus), Ph.D. ....... Giessen
Stephenson, K. R., Ph.D. ............... Wisconsin
Sundberg, C., Ph.D. ..................... Illinois
Thistlewaite, M. B., Ph.D. ............. Manchester
Wade, W. R., Ph.D. ..................... California (Riverside)
Wagner, C. G., Ph.D. ................... Duke

Associate Professors:

Freire, A., Ph.D. ......................... Princeton
Kimble, K. (UTSI), Ph.D. ............... Ohio State
Kot, Mark, Ph.D. ....................... Arizona
Kuo, Y., Ph.D. ......................... Cincinnati
Muller, D. D. (Emeritus), Ph.D. ......... Wisconsin
Plaut, Conrad, Ph.D. .................... Maryland
Richter, Stefan (Liaison), Ph.D. ......... Michigan
Row, W. H., Jr., Ph.D. .................. Wisconsin
Smith, J., Ph.D. ......................... California

Assistant Professors:

Collins, Charles R., Ph.D. ............... Minnesota
Dobb, D. E., Ph.D. ..................... Cornell
Daverman, Robert J., Ph.D. .............. Wisconsin

The Mathematics Department has three graduate degrees: (1) the Master of Mathematics degree, intended primarily for teachers, (2) the Master of Science degree, designed to prepare students for industrial employment and for teaching, and (3) the Doctor of Philosophy degree, designed to prepare students for academic positions in universities.

A student offering mathematics as a minor for the master's degree is required to obtain at
least 6 hours of resident graduate credit in courses numbered above 400 and approved by both the major department and the Department of Mathematics.

For additional information, please visit the graduate website on the Department of Mathematics homepage at www.math.utk.edu.

THE MASTER OF MATHEMATICS PROGRAM

Before admission to the Master of Mathematics program, the applicant must have either (a) certification for teaching secondary mathematics in at least one state, or (b) three years of elementary school, secondary school, or community college teaching experience. Applicants must have successfully completed one year of calculus (141-142 or equivalent) and a course in matrix algebra (251 or equivalent).

The following requirements must be met:
1. Complete 30 hours of coursework in which 21 must be at the 500 level. The coursework must include 504, 505, 506, 507, and 9 hours in Group IV. At most, 6 hours may be taken outside the Department of Mathematics (selected in consultation with the advisor).
2. Pass a final examination upon completion of all coursework.

In exceptional circumstances, part of the admission requirement (b) might be satisfied concurrently with coursework. Normally, Master of Mathematics degree students will start the program by taking 504 during the summer.

THE MASTER OF SCIENCE PROGRAM

The department offers two options for the Master of Science degree. The first option requires a thesis for which 6 hours must be earned along with 24 additional hours of work in acceptable courses numbered above 400. Of the additional hours, 6 may be in an area outside the department and 15 must be in courses in mathematics numbered above 500.

After one semester of graduate study, a student whose advisory committee gives its approval may choose the non-thesis option, for which 30 hours in courses numbered above 400 are required. Of these, 21 hours (at least 15 of which must be in mathematics) must be in courses numbered above 500. 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:
2. One hour of Seminar in Applied Mathematics 519 or Seminar in Mathematical Ecology 589.

THE DOCTORAL PROGRAM

For the Ph.D. program in Mathematics, the student must meet the following requirements in addition to those of The Graduate School:
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.
2. 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 examinations. A student's doctoral committee may require the student to pass the second language examination.
3. Pass an examination in the field of specialization. After the requirements in 1. and 2. have been met, this examination will be given by the student's doctoral committee.
4. Pass a one-year, 600-level sequence in mathematics outside the student's area of specialization. The examinations selected to fulfill this requirement must be approved by the student's doctoral committee. (Such approval may be granted 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 Knoxville).

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, or any combination of some or all the groups. The three subjects 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:

- The examinations to be taken must be approved in advance by the student's advisory committee.
- At any one time a student may take at most only the number of examinations necessary to complete the requirements.
- 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 UK 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.
- 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 the student's fifth year. In lieu of passing 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(s) count toward the limits in condition c.

Mathematical Ecology Concentration

The student must pass written examinations in three subjects:

- Mathematical Ecology 581-82.
- A subject from Groups I, II, and III of the standard program.
- 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 use of courses 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 writing outside class. Prereq: Matrix Algebra I and Introduction to Abstract Mathematics. Coreq: Matrix Algebra I.


402 Creative Writing for Teachers (3) Course designed to help beginning teachers develop skills in writing and the use of writing in the classroom. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

403 Models in Biology (3) Introduction to the mathematical models used in biology. Prereq: Probability and Statistics or consent of instructor.


453 Partial Differential Equations (3) Separation of variables. Prerequisites: Calculus III and Introduction to Abstract Mathematics, or consent of instructor.


502 Registration for Use of Facilities (3-15) Required of all 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: Matrix Algebra I.

506 Algebra for Teachers (3) Algebraic structures: groups, rings, fields, etc. Emphasis on applications. Prereq: Matrix Algebra I.

510 Ordinary Differential Equations (3,3) Analytical methods for the solution of ordinary differential equations. Prereq: Calculus III.


517-18 Mathematical Methods in Physics (3,3) (Same as Physics 571-72.)


525-26 Statistics (3,3) Pertinent facts from probability theory, definition of abstract probability spaces; Kolmogorov completeness theorem; series of independent random variables and laws of large numbers; general theory of distributions of random vectors; their characteristic functions; weak compactness and Levy's continuity theorem in Euclidean space; infinitely divisible distributions and stochastic integrals; basic laws, 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, Neyman-Pearson lemma, the likelihood ratio test, power functions, general linear models, estimation and tests in linear models; non-parametric tests, rank methods for comparison, linear inequalities, and independence; from decision theory. Prereq: 445-46. Recommended prereq: 456.

527 Stochastic Modeling (3) Stochastic models in applied probability, queuing theory, branching processes. Monte Carlo simulation. Prereq: 445-46 or consent of instructor.


539 Seminar in Mathematics (1-3) Topics vary. Requires out-of-class projects and in-class presentations by students. Credit hours announced for each seminar. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.


subspaces and their approximating properties; rates of convergence. Computer implementation. Prereq: 435, 443, 446, 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: 445-46 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: 455-46 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-Bonnet theorem, hyperbolic geometry, Manifolds and Riemannian metrics, connections, geodesics, Jacobi fields, sectional curvature. Differential forms and moving frames. Prereq: 445-46 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) Advanced topics in study of iterative and direct methods for large systems of linear equations: sparse matrix analysis, relationship to modern computer architectures. Prereq: 453, 471-72, or consent of instructor. May be repeated. Maximum 8 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 Biology and Evolutionary Biology 581-582.)

592 Mathematical Evolutionary Theory (3) Population genetics and evolutionary ecology. Prereq: 431, 453 or consent of instructor.

594 Mathematical Systems Theory (3) Analytic approach to discrete and continuous dynamical control systems; optimality conditions. Applications to ecology. Prereq: 431, 453, 445-46 or consent of instructor.

595 Optimal Control Theory (3) Deterministic optimal control. Examples including calculus of variations, optimal trajectories, and engineering control problems. Introduction to stochastic control. Prereq: 445-46 or consent of instructor.

596 Seminar in Mathematical Ecology (1-3) May be repeated. Maximum 12 hrs.

597 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. E


619 Seminar in Applied Mathematics (1-3) May be repeated. 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. Subfields vary according to interests of instructors and presentations 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.


649 Seminar in Analysis (1-3) May be repeated with consent of department. Maximum 12 hrs.

651-52 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.

658 Seminar in Algebra (1-3) Prereq: Consent of instructor. May be repeated with consent of department. Maximum 12 hrs.


663-64 Algebraic Topology (3,3) Homology, cohomology and homotopy theories, duality theorems and Hurewicz isomorphism theorem. Prereq: 561-62 or 1 yr of abstract algebra, 455-56 or 551-52. May be repeated with consent of department. Maximum 12 hrs.

667-68 Advanced Differential Geometry (3,3) Selected topics from Riemannian geometry and analysis on manifolds: Lie groups, intrinsic geometry, spectrum of Laplacian, Lie groups, variational problems, curvature and topology of manifolds. Prereq: 567-68 or consent of instructor. May be repeated with consent of department. Maximum 12 hrs.

669 Seminar in Topology (3) May be repeated with consent of department. Maximum 12 hrs.


679 Seminar in Numerical Mathematics (1-3) May be repeated with consent of department. Maximum 12 hrs.

681-82 Advanced Mathematical Ecology (3,3) Selected topics in theoretical and applied mathematical ecology: population, community, ecosystem structure, dynamical systems, spectral and applied topics such as demography, ecotoxicology, epidemiology, environmental change, and resource management. Prereq: 581-82. May be repeated. (Same as Biology and Evolutionary Biology 681-682.)
Graduate programs leading to the degrees of Master of Science and Doctor of Philosophy are available with majors in Mechanical Engineering, Aerospace Engineering, and Engineering Science. Changes in the offerings, as previously described, of these programs to another requires departmental approval. Each applicant is advised to refer to any prerequisite courses before entering a program.

In Mechanical Engineering, program concentrations include energy conversion and utilization; propulsion; heat transfer and fluid mechanics; thermodynamics; space engineering; gas dynamics; machine design; dynamics, control, and robotics; power generation; and stress analysis.

In Aerospace Engineering, program concentrations include energy conversion and utilization; propulsion; heat transfer and fluid mechanics; thermodynamics; space engineering; aerodynamics and performance; gas dynamics; flight and aerospace mechanics; acoustics; and structures and stress analysis.

In Engineering Science, program concentrations include solid mechanics, fluid mechanics, computational mechanics, mechanics of composite materials, biomedical engineering, industrial engineering, and optical engineering (UTSI only). In each of these concentrations, interdisciplinary programs are arranged to meet individual needs or interests. The flexibility and interdisciplinary aspect of the program concentrations are intended to be of particular interest to prospective students currently employed in research, development, or design activities and whose interests in continuing education (either full-time or part-time) lie at one of the interfaces between science and engineering or can best be met by interdisciplinary study in engineering. The program's course offerings and changing frontiers are also intended to meet the needs of students who seek preparation for employment in engineering areas requiring specialization in mechanics or in related interdisciplinary studies such as biomechanics.

In Mechanical Engineering or Aerospace Engineering, entrance into the Master of Science program is available to qualified graduates of recognized undergraduate curricula in mechanical or aerospace engineering and to qualified graduates of other curricula who satisfy the necessary prerequisites. A program application is required in addition to the Graduate School application. Admission into the doctoral program will be granted to those applicants who have demonstrated superior achievement in their engineering backgrounds. The general GRE is required of all international applicants for admission.

Each student must satisfactorily complete a program of study that has been approved by his/her advisory committee and complies with the requirements of the Graduate School. In Engineering Science, the student's major professor may be selected from a department other than the Department of Mechanical and Aerospace Engineering and Engineering Science; however, at least one member of the student's graduate advisory committee must be on the faculty of the Department of Mechanical and Aerospace Engineering and Engineering Science.

THE MASTER'S PROGRAM

In both Mechanical Engineering and Aerospace Engineering, three M.S. options are offered. Option I requires a thesis, while options II and III do not. Option I is the normal program for recent graduates. Options II and III provide (a) graduate students with significant professional work experience and (b) graduate co-op students the opportunity to focus their programs in special areas through either greater coursework or selected engineering problems. Credit requirements for these three options are summarized below.

<table>
<thead>
<tr>
<th>Course Areas</th>
<th>Hours Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option I</td>
<td>24 30 24</td>
</tr>
<tr>
<td>Coursework</td>
<td>12 18 12</td>
</tr>
<tr>
<td>Mathematics</td>
<td>6 6 6</td>
</tr>
<tr>
<td>Engineering courses below 500 (maximum)</td>
<td>3 3 3</td>
</tr>
<tr>
<td>Thesis credit</td>
<td>6 n/a n/a</td>
</tr>
<tr>
<td>Problems credit (590)</td>
<td>n/a n/a</td>
</tr>
<tr>
<td>Total</td>
<td>30 30 30</td>
</tr>
</tbody>
</table>

All three program options require participation in the departmental graduate seminars program, and passing a final examination on all work submitted for the degree. Option II final examination will cover all course work. Option III final examination will cover all the selected engineering problems. The thesis option, Option I, requires submission and defense of a written thesis that demonstrates the ability to conduct and report an independent investigation. The problems option, Option III, requires a formal report to be written for each selected engineering problem.

In Engineering Science, two M.S. options are offered: Option I requires a thesis, while Option II does not. The Option II is restricted to those students who have had significant engineering professional work experience. In Option I, a minimum of 30 semester hours including the thesis is required. In Option II, a minimum of 30 hours is required. Credit requirements for these two options are summarized below.

<table>
<thead>
<tr>
<th>Course Areas</th>
<th>Hours Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option I</td>
<td>24 30</td>
</tr>
</tbody>
</table>
residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The Ph. D. program in Aerospace Engineering is available to residents of the states of Arkansas or Kentucky. The M.S. in Aerospace Engineering is available to residents of Kentucky. The Ph. D. program in Engineering Science is available to residents of the state of Florida (concentration in biomedical engineering only). Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

**GRADUATE CREDIT FOR UNDERGRADUATE COURSES**

Students majoring in Mechanical Engineering or Aerospace Engineering may not normally use more than one 400-level engineering course to meet their advanced degree requirements. For students majoring in Engineering Science, four hundred-level courses in engineering may be used for graduate credit at the discretion of the advising committee. However, at least two-thirds of the minimum requirement for a graduate degree program must be at or above the 500 level. With the approval of the student's major department, a student whose major is outside the Department of Mechanical and Aerospace Engineering and Engineering Science may take senior (400-level) courses in a master's degree program for graduate credit. Such students should consult with instructors regarding prerequisites for undergraduate courses.

**Aerospace Engineering**

NOTE: Not all the courses listed below are available at both the UT Knoxville and the UTSA campuses.

**GRADUATE COURSES**

*222 Aerodynamics (3)* Theory and design of aero- 
dynamical bodies for desired characteristics. Potential flow theory, viscous effects, compressibility effects, sub- 
sonic, transonic, and supersonic airfoils. Prereq: 370. F

*232 Viscous Flow (3)* Boundary layer theory, laminar and 
turbulent flow, compressibility effects; numerical solu-
tion methods. Prereq: 422 or Heat Transfer consent of instructor. F

*242 Astronautics (3)* Propulsion, trajectories, guidance, 
control, and atmospheric reentry of space vehicle 
systems. Prereq: Thermodynamics, Mechanical Vibration. Sp

*425 Propulsion (3)* Principles of propulsion devices; 
turbo-jet, ram jet and rocket engines. Prereq: 351. F

*426 Introduction to Aerospace Design (2)* Design 
process, synthesis, safety, reliability, patents, product 
liability, economic analysis, optimization, design stan-
dards, design studies. Individual design reports. Prereq: 351, 370, 363, Coreq: Mechanical Engineering 344. F

*429 Aerospace System Design (4)* Synthesis and design of complete aerospace system, economic and technical 
aspects. Participation in team design effort, formal presenta-
tions and design report. Prereq: 425, 426. Sp

*449 Aerospace Engineering Laboratory (3)* Designing, 
conducting, and reporting results of experimental exer-
iments. Test standards and specifications, data analysis 
and conclusions of experiments. Prereq: 345, 351. 3 labs. F

*451 Selected Topics in Aerospace Science (1-4)* 
Current problems and topics in aerospace science. Prereq: Consent of instructor.

511 Inviscid Flow (3)* Kinematics and dynamics of 
inviscid fluids; potential flow about body, conformal 
mapping. Prereq: 422 or Mechanical Engineering 531. Mathematics 425 or equivalent.

**513 Experimental Methods in Fluid Mechanics (3)* Experimental techniques in laboratory research. Representative experiments: hot wire anemometry and turbulence measurements, flow visualization, wind tunnel tests, water table experiments, supersonic flow experi-
ments, boundary layer measurements, laser-optical measurements. Prereq: 423 or Mechanical Engineering 531.

**515-16 Air Vehicle Aerodynamics and Performance (3,3)* Aerodynamic principles to air vehicles to 
provide estimates of performance, stability, and control characteristics for subsonic to hypersonic speeds. Relations among thrust, drag, lift and altitude, propulsion systems, vehicle performance characteristics, and trau-
jectory optimization. Prereq: 422, 515 for 516.

**521-22 Aerodynamics of Compressible Fluids (3,3)* One-dimensional internal and external flow; waves; small perturbation theory; slender body theory; similarity rules; method of characteristics. Prereq: 422 for 521; 521 for 522.

**525 Hypersonic Flow (3)* Shock layer; flow tests; music interactions; free molecule and rarefied gas flow. Prereq: 512.

**527-28 Aerospace Ground Test Facilities (3,3)* Atmospheric models and similarity considerations; aerody-namic test facilities: continuous and intermittent wind 
tunnels and ballistics range; propulsion test facilities or aircraft engines; environmental and space vehicle test facilities. Prereq: 512 and 513, Mechanical Engineering 513 and 522.

**529 Rarefied Gasynamics (3)* Binary elastic collisions; 
kinecic; flow regimes; Boltzmann and model equa-
tions; transfer equations, gas-surface interactions; slip 
boundary conditions, free molecule, slip and transi-
tion flow; Monte Carlo simulation; experimental tech-
niques; introduction to hypersonic and real gas flows. Prereq: 522, Mechanical Engineering 522.

**531 Magnetohydrodynamics (3)* Electromagnetic field 
theory; chemical kinetics; thermodynamic and thermo-
physical properties of gas; governing equations and applications. Prereq: 422 and Mathematical Methods 471.

**532 Introduction to Turbulence (3)* Macroscopic ef-
ects, analogies, statistical treatment, correlation func-
tions, energy spectra, diffusion; application of turbulent 
jets and pipe flow. Prereq: 511-12.

**534 Atmospheric Entry (3)* Entry trajectories; lift and 
drag during reentry; vehicle motion and stability during 
reentry; aerodynamic heating and heat protection sys-

**544 Transonic Flow (3)* Nature of flow at transonic 
speeds; small disturbance theory; shock wave prop-
erties; shock-free flows; strong viscous interaction 
phenomena; solution techniques. Prereq: 522. F

**551 Aerospace Mechanics (3)* Principles of mechanics 
applicable to aerospace vehicles, equations of motion, 
multibody problems and trajectory analysis. Prereq: Mathematical Methods 471.

**554 Aerospace Vehicle Stability and Control (3)* Static 
and dynamic longitudinal directional and lateral stability 
and control. Coupled modes. Motion with free and fixed 
flight control surfaces. Automatic control systems. Prereq: 423, 511.

**556 Vertical or Short Take Off and Landing Aircraft (3)* 
Performance, stability, control of rotary wing, tilt 
wing, vectored lift and jet vertical type aircraft. Vertical 
and transition flight modes. High lift airfoils. Automatic control, simulation facility types and flight testing. Prereq: 555.

**557 Aerospace Vehicle Flutter and Vibration (3)* 
Aeroelastic phenomena. Structural and aerodynamic 
operators. Stability criteria for airfoils operating in oscill-
latory aerodynamic operator, forced response, static 
and dynamic Eigenvalues of simplified structures. Appli-
cations to typical systems. Prereq: 557.

**561 Fundamentals of Aeroacoustics (3)* Generation, 
propagation and absorption of sound in static and moving 
media. Prereq: Consent of instructor.

**564 Spacecraft Attitude Dynamics and Control (3)* 
Rotational attitude dynamics of space vehicles. Gyro-

scopic instruments; passive and active attitude control devices. Linear control theory and attitude stabilization. (Prep: 551, Mathematics 471.)

574 Space Engineering: Satellite Technology (3) Satellites and rockets (orbit, launch vehicles and launching), spacecraft structure, power systems, attitude control system, telemetry/tracking/command, and communication system, spacecraft fault testing, reliability, and application of satellites (communication, weather, Earth observation, and future applications). Prep: 425, Mathematics 471.

590 Selected Engineering Problems (2-6) Enrollment limited to students in problems program. Prep: Consent of advisor.

599 Special Topics in Aerospace Engineering (1-3) May be repeated. Maximum 6 hrs.

631 Magnetohydrodynamics (3) Electromagnetic field equations, motions of single charged particle, statistical description of plasma, Boltzmann equation, conduction and diffusion in beryllium, copper, and magnetohydrodynamic equations. Prep: EORC or CPE 512, Mathematics 561 or equivalent.

632 Magnetohydrodynamics II (3) Alfvén and shock waves, exact solution for magnetohydrodynamic channel flow, one-dimensional equations, spacecraft, engineering applications of magnetohydrodynamics, propulsion and power generation. Prep: 631 and Mathematics 562.


645 Theory of Turbulence (3) (Same as Engineering Science and Mechanics 645.)

651-52 Advanced Aerodynamics (3,3) Subsonic, transonic, supersonic, and hypersonic flows. Evanescence waves, linearized boundary layers, shock waves, hypersonic flight, theoretical and experimental methods, laminar and turbulent boundary layers, shock waves, and jet propulsion. Discussion of special topics according to interest of students. Prep: 511, 522.


690 Advanced Topics in Aerospace Engineering (3) Prep: Consent of instructor. May be repeated. Maximum 9 hrs.

Engineering Science

GRADUATE COURSES

421 Materials of Engineering (3) Mechanical properties of metals and alloys; selection and processing; time dependent and cyclic dependent stresses; fatigue; failure mechanisms; design and material selection. Prep: 321, Materials Science and Engineering 201. 3 hrs or 2 hrs and 1 lab.

423 Fracture-Safe Design (3) Critical review of variables controlling fracture toughness: plane and form geometry, temperature, loading rate, section thickness, material characteristics, fracture toughness by stress intensity factors, strain energy release rates, J integral, COD data, laboratory and fracture toughness data in design. Prep: 321 and Materials Science and Engineering 201. (Same as Materials Science and Engineering 478). 3 hrs or 2 hrs and 1 lab.

426 Fundamental Principles of Composite Materials (3) (Same as Materials Science 426.)

429 Introduction to Ceramic Matrix Composites (3) (Same as Materials Science 429.)

433 Dynamic Systems (3) Three dimensional dynamic systems: particles and rigid bodies; gyroscopic variables; mass systems; central force motion; Lagrange's equations; stability, transfer functions. Prep: Dynamics.

435 Engineering Acoustics (3) Concepts of acoustics, dimensional analysis, measures of sound and their units, noise generation and transmission, noise control principles and application, materials and procedures for noise abatement. Prep: Senior standing or consent of instructor.


443 Advanced Experimental Analysis (3) Theory, techniques, and instrumentation of resistance strain gauges; techniques of bimetallic coating method; introduction to other strain measuring devices. Prep: 321, Electrical and Computer Engineering 301. 2 hrs and 1 lab.

455 Dynamic Data Acquisition (3) Use and calibration of instrumentation for measuring and recording dynamic events. Fourier analysis, transfer function analysis, digital signal processing, reconstruction, experimental parameter estimation with applications to modal vibration analysis. Prep: Circuits and Electronic Measurement 301, 2 hrs and 1 lab.

471 Clinical Engineering and Bioinstrumentation (3) Function and characteristics of diagnostic equipment in healthcare delivery systems: hospital organization and health care economics, development and management, and psychological counseling. Biomedical instrumentation: system operational characteristics; performance of transducers, signal conditioning, data readout and storage devices; selection of biomedical equipment, system design, equipment maintenance and control programs for hospital clinical issues and professionalism in clinical engineering. Prep: Medical and Electrical Engineering 311. Introduction to Pattern Recognition.

473 Biomechanics (3) Mechanical properties of living tissues; biomechanics of injury; mechanisms of prostheses; material compatibility of prosthetic devices; biomedical problems associated with tissue engineering. Prep: 321.

475 Design of Artificial Internal Organs (3) Design, development and evaluation of artificial internal organs; analysis of transport processes in therapeutic devices for design; optimization of currently available devices; federal regulation and ethical considerations. Prep: 341, Mathematics 231.


481 Principles of Engineering Acoustics (1-3,1-3) Introduction to acoustics and the application of acoustics to engineering problems. Prep: Consent of instructor. May be repeated with consent of department.


526 Ceramic Matrix Composites: Material and Mechanical Behavior (3) Micromechanics and microstructural design; fabrication of ceramic matrix composites; interface characterization and mechanics; electron microscopy examination; fracture; fatigue; application. Prep: 429 or consent of instructor. (Same as Materials Science and Engineering 526.)


536 Advanced Engineering Acoustics (3) Introduction to theory and application of acoustic analysis; vibration of continuous systems, plate and cylindrical waves, transmission phenomena, radiography and scattering, Resonators, filters, absorption mechanisms, microphones, ultrasonics, sonar transducers. Prep: 435 or undergraduate vibration courses.

539 Continuum Mechanics (3) Cartesian tensors, transformation laws, basic continuum mechanics concepts; stress, strain, deformation, constitutive equations. Conservation laws for mass, momentum, energy. Applications in solid and fluid mechanics.

562 Experimental Mechanics of Composite Materials (3) Stress-strain relationships for orthotropic and transversely-isotropic materials; anisotropic composite laminate and laminate; stress and strain transformation; composite laminate theory; fiber, matrix, fiber-matrix interface, and composite mechanical properties (tensile, flexure, compressive, shear); physical properties: stress field, stress intensity factor, notch sensitivity; strain energy release rate, composite fracture toughness, failure analysis, fracture mechanics. Prep: 321, Mechanical and Aerospace Engineering and Engineering Science 521 or consent of instructor. (Same as Materials Science and Engineering 562.)

564 Laser Processing of Materials (3) Physics and engineering associated with laser processing of metals and composites. Physics: lasers, optics, plasmas, heat transfer, phase transformations, solidification and fluid flow, melting, cutting, machining, brazing, soldering, glazing, alloying and hardening. Prep: 321, Mechanical and Aerospace Engineering and Engineering Science 521 or consent of instructor. (Same as Materials Science and Engineering 564.)

565 Optical Engineering I (4) Wave optics; scalar diffraction theory; introduction to Fourier optics; ray or geometric optics; lenses, mirrors, gratings; paraxial design; aberrations, aberration corrections.

566 Optical Engineering II (4) Statistical optics: spatio-temporal and induced emission; black and gray body radiation; incoherent, partial and totally coherent radiation; mutual coherence function; detectors, radiometry.

571 Biomaterials 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, and other properties of biological systems; biomaterials for microvascular systems; biodegradability of solids and liquids, mechanical properties of blood vessels; skeletal, heart and smooth muscle; and cartilage. Research paper.


578 Fuzzy Systems in Engineering (3) (Same as Nuclear Engineering 578.)

591 Special Topics in Engineering Mechanics (3) Mechanics problems related to recent developments. Prep: 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 Knoxville and the UTSI campuses.

GRADUATE COURSES


451 Systems and Controls (3) Analytical models of physical systems comprised of combinations of mechanical, electrical, and thermal components; feedback control systems, transient and frequency response, stability analysis; non-linear control of linear systems; sampled data systems, digital filters. Prereq: Mechanical Engineering Instrumentation and Measurement, Circuits and Electro Mechanical Components. F, SP.

455 Introduction to Design (2) Engineering economy, optimization, design for automation, reliability, patents and product liability; design of mechanical engineering solid mechanics system. Participation in team design effort; design report. Prereq: Dynamics and Vibrations of Machines.

456 Introduction to Thermal Design (2) Engineering economy, optimization, design for automation, reliability, patents and product liability; design of mechanical engineering thermal-fluid system. Participation in team design effort; design report. Prereq: 332, 344, F.


469 Machine Design (4) Design of complete machine; documentation, complete specifications, design calculations, working drawings, and cost analysis. Written and oral report. Prereq: 455, 468, SP.

471 Refrigeration and Air Conditioning (3) Vapor compression and absorption cycles; heat pump systems; psychrometric processes; air washers; cooling towers; solar radiation; building heat transmission. Prereq: 332, 344.

475 Thermal Engineering (3) Thermal systems, thermodynamics, heat exchangers, combustion and system analysis. Prereq: 332, 344, F, SP.

479 Thermal Engineering Design (4) Design of complete thermal-fluid system, economic, technical and optimization aspects. Participation in team design effort, formal presentations and design report. Prereq: 456, 475, SP.


494-485 Selected Topics in Mechanical Engineering (1-4) Problems and topics related to developments and practice in mechanical engineering. Prereq: Consent of instructor. E.


507 Application of Numerical Linear Algebra in Systems and Control Engineering (3) (Same as Chemical Engineering 507 and Electrical Engineering 507.)


514 Phase Change Heat Transfer (3) Mechanisms and modeling of nucleate, transition and film boiling processes; critical heat flux; forced convection boiling and pool dry-out heat transfer; condensation processes; heterogeneous nucleation; dropwise and filmwise condensation; heat transfer; liquid-solid phase change processes; conduction of phase fronts: mathematical modeling. Prereq: 344, 511.

521-22 Thermodynamics I and II (3, 3) Macroscopic thermodynamics, including First and Second Law analyses, availability, phase and chemical equilibrium criteria, combustion, gas mixing, and property relations; application of thermodynamic properties from molecular structure, spectroscopic data, kinetic theory, statistical mechanics, quantum physics, Schroedinger equation. Prereq: 332.

523 Special Topics in Thermodynamics (3) Application of thermodynamics to topics of interest in mechanical engineering. Prereq: Consent of instructor.

525 Combustion and Chemically Reacting Flows I (3) Fundamentals: thermodynamics, chemical kinetics and conservation equations; phenomenological approach to laminar flows; diffusion and premixed flames; single droplet combustion; deflagration and detonation theory; stabilization of combustion waves in laminar streams, shock waves; similarity laws, flame acceleration and subsonic ignition and turbulent flames. Prereq: 522, 531, or consent of instructor.

526 Combustion and Chemically Reacting Flows II (3) Advanced topics: phenomenological approaches to turbulent flames; fundamentals of turbulent flow; application of probability density functions to turbulent flames; turbulent reacting flows with premixed and or non-premixed reactants; spray and jet models; fluidized bed combustion; chemically reacting boundary layer flow; gas turbine and rocket motor combustors; furnaces, introduction to supersonic combustion and hypersonic flows. Prereq: 525.

551-52 Mechanical Engineering Design (3, 3) Design of mechanical engineering devices and systems. Prereq: Consent of instructor.

553 Development of Superior Products and Processes (3) Case studies of latest techniques of superior product and process development in industry. Case study of project or process yielding superior results developed by student. Prereq: B.S. in Engineering or consent of instructor.

561 Rocket Propulsion I (3) Rocket propulsion fundamentals; thermodynamics of nonequilibrium flows and chemically reacting Ideal gases, rocket nozzle design; ideal rocket performance parameters; rocket heat transfer; chemist of propellants; liquid rocket engine systems, ground testing; introduction to solid propellant rockets. Prereq: Consent of instructor.

562 Rocket Propulsion II (3) Solid propellant rocket performance, homogeneous and heterogeneous propellant chemistry and combustion system performance, thermal decomposition and gas phase reaction models; effect of chamber pressure and additives on solid propellant burn rates, erosion burning; analysis of two-phase solid rocket exhaust flow. Introduction to nuclear and electric propulsion; electrical resistance and electric field (ion) engine performance, magnetohydrodynamic thrusters, traveling wave thrusters; exotic propulsion systems. Prereq: Consent of instructor.

584-485 Turbomachinery Systems I, II (3, 3) Ideal cycle analysis of turbine engines, real cycle analysis, components. Turbine analysis and systems integration (inlets, nozzles, combustors, compressors, turbines), flowthrough theory, turbine engine components, transient analysis, rotors and stationary, rotating stall, engine control systems, structural considerations. Prereq: First year graduate standing and consent of instructor.

586 Mechanics and Control of Robot Manipulators (3) Fundamentals of robot manipulation; kinematics and dynamics of manipulator arms, controller design for industrial robots, trajectory planning, compliant motion control and force control. Prereq: Matrix Computations, undergraduate dynamics and controls.


590 Selected Engineering Problems (2-6) Enrolment limited to students in programs program. Prereq: Consent of advisor. May be repeated. S/NC only.

599 Special Topics in Mechanical Engineering (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. Prereq: Consent of instructor.

Mechanical and Aerospace Engineering and Engineering Science

GRADUATE COURSES

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

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


552 Computational Fluid-Thermal Analysis (3) Solution of numerical solution of Navier-Stokes equations in two-dimensional, compressible, incompressible, and turbulent flows. Exact, approximate, and numerical solutions. Prereq. 542 and consent of instructor.


612 Numerical Modeling in Heat Transfer, Fluid Mechanics, and Energy Transfer (3) Implicit finite difference schemes for solution of Navier-Stokes equations in two and three dimensions. Numerical mapping techniques for solution of flow fields over complex geometries. Numerical algorithms for solving internal viscous laminar and turbulent flows with heat and mass transfer; transport models for internal flows; treatment of heat and mass transfer boundary conditions. Prereq. 512 and consent of instructor.

613 Advanced Radiation Heat Transfer (3) Radiation heat transfer in absorbing, emitting and scattering media; interaction of thermal radiation with conduction and convection heat transfer. Prereq. 511, 512.


642 Advanced Topics in Thermodynamics (3) Comparison of macroscopic and microscopic approach; equilibrium of pure substances, metastable states. Non-equilibrium thermodynamics. Prereq: Consent of Instructor.


ADMISSION REQUIREMENTS

Students are expected to have completed an undergraduate program with a 3.0 or better GPA on a 4.0 system. Included in the undergraduate course credits should be (1) a full year of general biological science, (2) one year of calculus, (3) two years of chemistry, including one year of organic, (4) one year of physics, and (5) an introductory course in microbiology. In many cases, deficiencies in prerequisites may be removed by taking appropriate courses during the first year of graduate study. The department also requires the general portion of the Graduate Record Examination. A satisfactory score on each part is 550 or higher with rare exceptions. Three letters of recommendation should be submitted by current or former faculty mentors.

Each new graduate student meets with an advisory committee chaired by the departmental Director of Graduate Studies to plan a program of study for the first or second semester. After this is selected, all first-year students participate in a laboratory rotation program during the first semester of study. This program allows the student to

Metallurgical Engineering

See Materials Science and Engineering

Microbiology

(Majors of Arts and Sciences and College of Veterinary Medicine)

MAJOR

DEGREES

Microbiology ........................................ M.S., Ph.D.
Veterinary Medicine .............................. D.V.M.

Robert Moore, Head

Professors:
Beck, Raymond W. (Emeritus), Ph.D. Wisconsin
Becker, Jeffrey M., Ph.D. ...................... Cincinnati
Brian, D.A., Ph.D., D.V.M. ................... Michigan State
Monte, T.C., Ph.D. .............................. Maryland
Moore, R.N., Ph.D. ............................. Texas
Riggsby, W. Stuart, Ph.D. .................... Yale
Rouse, B.T., Ph.D. ............................... Georgia
Savage, Dwayne C., Ph.D. .................... Idaho
Stacey, G. (Liaison), Ph.D. ................... Texas
White, D.C. (Distinguished Scientist), Ph.D. Rockefeliver
Woodward, J. M. (Emeritus), Ph.D. ...... Kansas
Wust, Carl J. (Emeritus), Ph.D. ............ Indiana

Assistant Professor:
Hacker, David, Ph.D. ............................ Michigan State
Zaghouani, Habib, Ph.D. ..................... Paris

Microbiology

The Department of Microbiology offers both the M.S. and Ph.D. Students have the option of selecting from a variety of graduate research programs. For a departmental brochure, contact the department head.

Each new graduate student meets with an advisory committee chaired by the departmental Director of Graduate Studies to plan a program of study for the first or second semester. After this is selected, all first-year students participate in a laboratory rotation program during the first semester of study. This program allows the student to

Medical Biology

See College of Veterinary Medicine and Comparative and Experimental Medicine
adjust smoothly to the research programs of the department, to develop a background of research procedures and concepts, and to facilitate the selection of a research professor. Usually the student selects a research professor toward the end of the laboratory rotation period. The major professor assists in the selection of and carrying out of a suitable research program and in the naming of a thesis or dissertation committee.

THE MASTER’S PROGRAM

The program leading to the M.S. is designed to provide the student with broad basic knowledge, to permit the acquisition of technical competence in the fundamentals of research, and to encourage creative and independent thinking. Two to three calendar years are usually needed for the course of study that has the following requirements: (1) 30 hours including thesis credits; (2) a 3.0 GPA in all courses taken for graduate credit. (3) 12 hours of credit have been earned in courses graded on the A-F system; (4) a complete course sequence in biochemistry or molecular biology; (5) presentation of a research thesis and its oral defense.

THE DOCTORAL PROGRAM

The program leading to the Ph.D. is designed to develop the student’s ability to pursue independent and original research in microbiology and allied fields, to teach both oral and written communication of the results of research to the scientific community, and to train effective teachers. Students may enter the program after receiving either a bachelor’s or master’s degree. Students who enter with a bachelor’s degree usually receive the Ph.D. after four or five years; those with the master’s degree usually take three or four years to complete the degree. Departmental requirements are: (1) a 3.0 GPA in all courses taken for graduate credit. (2) At least 12 hours of credit have been earned in courses graded on the A-F system; (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. (F)

411 Bacterial Genetics (3) Transmission and expression of genetic information by bacteria. Prereq: Introduction to Microbiology. (Sp)

420 Medical Microbiology (3) Disease-producing microorganisms, including bacteria, rickettsiae, chlamydia and fungi. Prereq: Introduction to Microbiology. (Sp)

429 Medical Microbiology Laboratory (2) Laboratory exercises in medically important areas of microbiology, immunology, pathogenesis and microbiology. Prereq: Introduction to Microbiology Lab. Coreq: 420. (Sp)

430 Immunology (3) Principles of inflammation and immunity; immunoglobulin structure and theories of formation and diversity; complement, hypersensitivity, cell cooperation and recognitions in immune mechanisms; adverse factors. Prereq: General Genetics. (F)

440 Virology (3) Pathogenesis and molecular biology of viruses. Prereq: 310. (Sp)

470 Microbial Ecology (3) Physiological diversity and taxonomy of microorganisms from natural environments. Functional role of microorganisms in natural and simulated ecosystems. Prereq: 310. (F)

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

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

575 Applied Microbiology and Bioengineering (3) (Same as Chemical Engineering 575, Environmental Engineering 575, and Agricultural Engineering 5.)

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.

596 General Seminar (1) Lectures and seminars by invited speakers, faculty and graduate students. May be repeated. Maximum 18 hrs. S/NC only. (E)

596 Laboratory Rotation (1) Familiarization with research areas in department through series of rotations in laboratories of individual faculty members. May be repeated. Maximum 3 hrs. S/NC only. (E)

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

601 Journal Club in Microbiology (1) Readings and discussions based on original literature. May be repeated. Maximum 16 hrs. S/NC only. (E)

602 Journal Club in Microbial Pathogenesis (1) Readings and discussions based on original literature. May be repeated. Maximum 16 hrs. S/NC only. (E)

603 Journal Club in Immunology (1) Readings and discussions based on original literature. May be repeated. Maximum 18 hrs. S/NC only. (E)

604 Journal Club in Virology (1) Readings and discussions based on original literature. May be repeated. Maximum 16 hrs. S/NC only. (E)

605 Journal Club in Microbial Genetics (1) Readings and discussions based on original literature. May be repeated. Maximum 16 hrs. S/NC only. (E)

610 Topics in Microbiology (1-3) Prereq: 410 or consent of instructor. May be repeated. Maximum 12 hrs. (E)

620 Topics in Microbial Pathogenesis (1-3) Prereq: 420, 430 or consent of instructor. May be repeated. Maximum 12 hrs. (E)

630 Topics in Immunology (1-3) Prereq: 430 or consent of instructor. May be repeated. Maximum 12 hrs. (E)

640 Topics in Virology (1-3) Prereq: 440 or consent of instructor. May be repeated. Maximum 12 hrs. (E)

650 Topics in Microbial and Molecular Genetics (1-3) Prereq: 410 or consent of instructor. May be repeated. Maximum 12 hrs. (E)

670 Advanced Topics in Environmental Microbiology (1-3) Prereq: 570 or consent of instructor. May be repeated. Maximum 12 hrs. (E)

Microbiology-Veterinary Medicine

See College of Veterinary Medicine and Comparative and Experimental Medicine

Music

(College of Arts and Sciences)

MAJOR

DEGREES

Music.........................M.M.

Dolly Davis, Acting Head

Professors:

Ball, Charles H. (Emeritus), Ph.D........Peabody

Blitner, George C., M.M................Converse

Brook, John P. (Lieberman), M.M........Alabama

Carter, W. J. (Emeritus), D.M.A.........Eastman

Coker, F. E., M.A.......................Missouri

DeVine, George F. (Emeritus), Diploma........Scherz

Dorn, W. (Emeritus), M.A.............Columbia

Fred, Herbert W. (Emeritus), Ph.D........Columbia

Hawthorne, W. E., Ph.D....................Cincinnati

Gay, Jr., L. C., Ph.D......................Columbia

Hatha, Ph.D. (Emeritus), D.M.A............Yale

Hawthorne, W. J. (Emeritus), Ph.D........Columbia

McClelland, D. K., M.A....................Columbia

McCormick, W. E., Ph.D....................Boston

Meacham, John J. (Emeritus), M.M........Northwestern

Moore, M. C., Ph.D....................Michigan

Northington, D. B., D.M.A..............Yale

Pederson, D. M., Ph.D.....................Iowa

Sousa, G. E. (Emeritus), D.M.A.........Ohio State

Starr, W. J. (Emeritus), M.M.............Maryland

Stutzenberger, D. R., D.M.A.............Yale

Tippett, A. W., Ph.D.......................Michigan

Associate Professors:

Adams, Fay, M.M.......................Tennessee

Boling, M. E., M.M.....................Tennessee

Brown, Donald R., H.D.................Tennessee

Brunell, Donald R., H.D.................Tennessee

Carter, P. S., M.M.....................Colorado

Davis, D. L., M.A., M.M..............Tennessee

Duberry, T. S. D.M.A.....................Yale

Hough, Don, M.M.......................Tennessee

Leach, C. F., M.M.....................New Mexico

Searle, S. M., M.M....................Tennessee

Sperl, G. R., M.M.....................Indiana

Assistant Professors:

Batey, A. L., D.M.A....................South Carolina

Binder, S. L., M.M., M.M........Virginia Commonwealth

Gay, Jr., L. C., Ph.D.....................Columbia

Hawthorne, W. Ph.D......................Cincinnati

Murphy, G. A., Ph.D....................Ohio State

Romines, J. J., M.M......................Indiana

Schallert, G. T., D.A.....................Northern Colorado

Smith, C. B., M.M.......................SUNY-Fredonia

Wentzel, A. N., M.M......................Southern Cal

The Department of Music offers the Master of Music degree with concentrations in accompanying, choral conducting, composition, instrumental conducting, jazz, music education, musicology, performance (organ, piano, strings, voice, winds, and percussion), piano pedagogy and literature, sacred music, string pedagogy, and theory.

Applicants must have completed an undergraduate degree approximately equivalent in music requirements to those required in degrees conferred by UT Knoxville, 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 before the appropriate area faculty committee. 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 areas of concentration.

All applicants are required to take the Diagnostic Examinations in music theory, ear-training, and music history/literature. These examinations are given by the Department of Music at the beginning of each semester.

THE MASTER'S PROGRAM

A minimum of 30-33 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 history/literature and music theory and allow for elective courses. Specific curricula are available from the department.

The graduate recital is given in lieu of thesis by students with concentrations in performance, pedagogy, jazz, and accompanying. A performance project is given in lieu of thesis by students with concentrations in choral conducting, instrumental conducting, and sacred music. A thesis is required of students in composition, musicology, and theory. All concentrations require a written and oral final examination.

Concentration in Music Education

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. Students seeking initial certification should consult the requirements for the Master of Science degree in the College of Education. The program requires 510 and 520; 9 hours of music education electives at the 500 level; 6 hours of Thesis 505; 6 hours of 500-level courses in music theory or history; 2 hours of applied music at the 400 or 500 level; 2 hours of music ensemble at the 500 level; and 3 hours of electives at the 500 level.

A three-credit research problem and three extra hours of coursework in Music Education may be substituted for Thesis. If a larger thesis problem is desired, the thesis credit may be increased to 9 hours, and 3 hours of Music Education electives may be dropped. Diagnostic tests in theory, ear training, and music history will be required.

Music Education

GRADUATE COURSES

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

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

Music General

GRADUATE COURSES

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

501 Graduate Recital (E) 2

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

511 Lecture Recital (2) E

521 Special Topics in Performance (1-3) Prereq: Consent of department head. E

530 Advanced Band Literature and Conducting (3) Reading, conducting, and interpreting band scores suitable for school, college, and community bands; contemporary and standard band literature. Prereq: Consent of instructor.

540 Special Problems in Music Education (1-3) Prereq: Consent of department head. May be repeated. Maximum 3 hrs.


560 Psychology of Music Teaching (3) Research on musical perception and cognition and its application to teaching of music. Definition and measurement of music ability. Prereq: Course in general psychology and 1 yr of music theory or consent of instructor.

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.

593 Special Problems in Music Education (3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

Music Ensemble

GRADUATE COURSES

503 Small Jazz Ensemble (1) May be repeated. Maximum 12 hrs.

504 Jazz Ensemble (1) May be repeated.

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 Theater (1) May be repeated.

550 Concert Band (1) May be repeated.

552 Campus Band (1) May be repeated.

554 Varsity Band (1) May be repeated.

556 Laboratory 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 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 (2) 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.

490 Church Music Methods and Administration (3)

510 Music Bibliography (3) Bibliographic methodology in music.

540 Music in the Baroque Period (3) From c.1600 to 1750, rise of opera and oratorio, sacred and secular cantatas, instrumental forms, performance practice.

550 Music in the Classical 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-romantic.

580 Music in the Twentieth Century (3) From 1890, Debussy, to present, Stockhausen and others.

585 Topics in North American Music (3) Topics vary.

590 World Music (3) Attitudes and techniques of ethnomusicology. Survey of world music cultures. Interview and transcription projects.

593 Independent Study (1-15) See College of Arts and Sciences. Prereq: Consent of department head.

Music Instrumental

GRADUATE COURSES

490 Instrumental Conducting (3) Development of knowledge and skills in instrumental conducting; study of various periods and composers and relationships of different styles to conductor's art; musical analysis and practice in conducting. Prereq: Music Education 320 or equivalent.

580 Band Literature (3) Band literature and origins of band. Its expanded cultivation during past century in United States and Europe.

582 Instrumental Conducting Performance (1) Jury performance; conducting band or orchestra in public.
Music Jazz

GRADUATE COURSES

410 Advanced Improvisation (3) Further development of individual skills and solving individual problems in jazz improvisation. Prereq: 210 and 220.

420 Jazz Pedagogy (1) Methods and materials relating to teaching of jazz, designing and administering jazz programs, and rehearsal techniques for jazz ensembles. Prereq: Studio music and jazz major or consent of instructor.

520 Seminar in Jazz (3) Topic varies.

Music Keyboard

GRADUATE COURSES

420-30 Piano Literature I, II (3,3) 420—From 1750 to middle 19th century; 430—Middle 19th century to present. 460-70 The Organ and Its Literature I, II (3,3) Development of organ and organ literature from Middle Ages to present; problems of style and interpretation; pedagogical literature and methods; organ design. Music History 220 and consent of instructor.


520 Piano Literature Seminar (3) Topics vary. May be repeated. Maximum 6 hrs.

Music Performance

GRADUATE COURSES

All performance courses require an audition and consent of instructor. May be repeated. Maximum 8 hrs toward M.M. degree.

403 Flute (1-4)

405 Oboe (1-4)

410 Bassoon (1-4)

415 Clarinet (1-4)

420 Saxophone (1-4)

425 Horn (1-4)

430 Trumpet (1-4)

435 Trombone (1-4)

440 Baritone (1-4)

445 Tuba (1-4)

450 Percussion (1-4)

455 Voice (1-4)

460 Violin (1-4)

465 Viola (1-4)

470 Cello (1-4)

475 String Bass (1-4)

476 Electric Bass (1-4)

479 Guitar (1-4)

480 Piano (1-4)

485 Harpsichord (1-4)

490 Organ (1-4)

494 Composition (1-3)

495 Composition with Electronic Media (1-3)

496 Composition for Media (2)

500 Improvisation (1-2) May not be used toward applied music requirement.

503 Flute (1-4)

505 Oboe (1-4)

510 Bassoon (1-4)

515 Clarinet (1-4)

520 Saxophone (1-4)

525 Horn (1-4)

530 Trumpet (1-4)

535 Trombone (1-4)

540 Baritone (1-4)

545 Tuba (1-4)

550 Percussion (1-4)

551 Accompanying and Coaching (1-4)

555 Voice (1-4)

560 Violin (1-4)

565 Viola (1-4)

570 Cello (1-4)

575 String Bass (1-4)

576 Electric Bass (1-4)

579 Guitar (1-4)

580 Piano (1-4)

585 Harpsichord (1-4)

590 Organ (1-4)

594 Composition (1-3)

595 Composition with Electronic Media (1-3)

599 Improvisation (1-4)

530 Music Theory Pedagogy (3) Techniques, methods, and materials involved in college-level theory programs. Prereq: Consent of instructor.

540 Computer Projects (1-3) Programming languages, design and implementation of projects in computer-managed instruction. Prereq: Consent of instructor.

593 Independent Study (1-15) See College of Arts and Sciences. Prereq: Consent of department head.

Music Theory

GRADUATE COURSES

430-40 Counterpoint I, II (3,3) 430—Study of species counterpoint in modal and tonal styles, works of Palestrina and J.S. Bach. Prereq: 220. 440—Writing of contrapuntal forms of 18th century and fugue, analysis of works from 18th through 20th centuries. Prereq: 430.

450 Choral Arranging (2) Analysis of scores and writing of arrangements for choirs. Prereq: Theory IV or consent of instructor.

510 Musical Styles (3) Elements of design and their role in definition of musical styles. Prereq: Consent of instructor.

520 Analytical Techniques (3) Analytical techniques, contemporary approaches. Tonal and neotonal music. Prereq: Consent of instructor.

Nuclear Engineering

(College of Engineering)

MAJOR DEGREES

Nuclear Engineering ....................... M.S., Ph.D.

H. L. Dodds, Head

Professors:

Dodds, H. L., PE, Ph.D. .................... Tennessee

Mihalozc, J. T., Ph.D. ....................... Tennessee

Miller, L. F., PE, Ph.D. ..................... Texas A&M

Uhrig, R. E. (Distinguished Prof.), PE.

Ph.D. ........................................ Iowa

Upadhyaya, B. R., Ph.D. ................. California
Associate Professors:
Groer, P. G., Ph.D.........................Vienna
Katz, E. M., Ph.D., Ph.D.................Tennessee
Peyev, R. E., Ph.D.........................Tennessee
Ruggles, A. E., Ph.D......................Tennessee
Scott, T. H., Ph.D.........................Florida
Townsend, L. W., Ph.D....................Idaho

Hines, J. W., Ph.D..........................Ohio 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 M.S. or Ph.D. program (focusing on fission energy or fusion energy) or a radiological engineering concentration at the master's level.

The radiological engineering concentration prepares students for careers in the radiation safety field (health physics). The program is designed for graduates of undergraduate programs in engineering, physics, biology, and chemistry.

All entering students must have, as a minimum, competency in mathematics through ordinary differential equations, competency in atomic and nuclear physics, and competency consistent with a course in introductory nuclear engineering. If these competencies do not exist, the student must take appropriate courses for undergraduate credit. The department head is the contact for all interested students, both those with nuclear engineering degrees and those from other disciplines.

THE MASTER'S PROGRAM

A graduate program leading to the Master of Science is available to graduates of recognized undergraduate curricula in engineering and physics. Each applicant will be advised as to the necessary prerequisite courses before he/she enters the program.

The student must complete 24 semester hours of coursework approved by the student's advisory committee that includes the following:

1. A major consisting of a minimum of 12 semester hours of graduate courses in nuclear engineering. This must include at least one of the following sequences: 511, 512; 551, 552; 571, 572.  
2. A minor of 6 semester hours of elective courses in mathematics, statistics or computer science.  
3. Six semester hours in either nuclear engineering or a related field. The M.S. candidate must also demonstrate research or design capability. This requirement may be satisfied by a thesis project or an engineering project as described below.

Thesis - The student performs independent research on a topic approved by the graduate committee. He/she submits a thesis on this research. The student then must pass an oral examination on the thesis and all course work. The student must enroll for six semester hours of NE 500 (Thesis).

Engineering Practice - The student performs independent research on two to four separate topics approved by his/her graduate committee. Each project is similar to a thesis project but smaller in scope. He/She submits a report, in thesis format, on each project. The student must then pass an oral examination on his/her engineering practice reports and all graduate coursework. The student must enroll for six semester hours of NE 598 (Nuclear Engineering Practice).

THE DOCTORAL PROGRAM

Students in the field of nuclear engineering desiring to study for the Doctor of Philosophy must have a Bachelor of Science or Master of Science from a recognized university, with a major in engineering or physics. All candidates will be required to demonstrate general competence in a comprehensive examination in the areas of engineering science, mathematics, physics, and nuclear engineering.

Specific course requirements for the Ph.D. in Nuclear Engineering include:

1. A minimum of 48 semester hours beyond the Bachelor's degree, exclusive of credit for the M.S. thesis or Nuclear Engineering Practice.  
2. A minimum of 24 semester hours in doctoral research, NE 600.  
3. A minimum of 30 semester hours in nuclear engineering 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 and above from a department other than nuclear engineering. The choice depends on the student's overall program and should expand his/her knowledge in a given field.  
6. A reading knowledge of one foreign language may be specified by the student's doctoral committee.

The comprehensive examination is prepared by the nuclear engineering faculty and consists of 12 hours of written examinations. All past examinations are filed in the library, and students are encouraged to review them. Students are invited to take the comprehensive examination after completing approximately 30 semester hours of coursework. A student who fails the written part of the examination must take and pass the examination the next time it is offered to remain in the Ph.D. program. Registration for NE 600 is not permitted until the written examination is passed. The comprehensive examination is completed with a successful oral defense of the dissertation proposal. A candidate must successfully defend, in an oral examination, all work presented for the degree—all coursework and the dissertation.

GRADUATE CREDIT FOR UNDERGRADUATE COURSES

400-level courses in nuclear engineering may be used for graduate credit. However, students must recognize that at least two-thirds of the minimum required hours (30) in a master's degree program must be taken in courses numbered 500 or above.

GRADUATE COURSES

403 Nuclear and Radiological Engineering Laboratory II (3) Cross section measurements, diffusion properties of materials and irradiated specimens, alpha and beta spectrometry, radiation fields and dosimetry. Prereq: Nuclear and Radiological Engineering Laboratory I.  
404 Nuclear Fuel Cycle (3) Mining, milling, fabrication, in-core management, reprocessing, waste disposal, regulatory and radiation health issues and requirements. Prereq: 470 or equivalent.  
405 Reactor Dynamics, Control and Safety (3) Reactor models, transient analysis, safety analysis, control systems and safety systems. Prereq: 470.  
406 Radiation Shielding (3) Types of radiation sources, fundamentals of gamma rays and neutron attenuation, biological effects, approximate methods of shield design, dose-rate analysis, and Monte Carlo. Prereq: Physics 232.  
421 Introduction to Nuclear Criticality Safety (3) Fundamentals of nuclear criticality safety; critically accidents; safety standards; overview of experiments, computational methods, and applications. Prereq: Intro. to Nuclear Engineering.  
432 Radiation Risk Analysis (3) Radiation risk estimates for normal and internal radiation, dose-response models, dose rate effects, prediction of radiation risk, radiation safety standards.  
463 Introduction to Fusion Energy I (3) (Same as Electrical Engineering 463.)  
464 Introduction to Fusion Energy II (3) (Same as Electrical Engineering 464.)  
470 Nuclear Reactor Theory I (3) Fundamentals of reactor physics relative to cross sections, kinematics of elastic scattering, reactor kinetics, reactor systems and nuclear data. Analytical and numerical methods applicable to general criticality problems, eigenvalue searches, neutron transport theory, and multigroup diffusion equations. Prereq: Introduction to Nuclear Engineering.  
471 Nuclear Reactor Theory II (3) Thermal spectrum computational methods: heterogeneous effects in fast and thermal spectra; considerations in reactor core design; equations that relate thermal and neutronic variables; power distribution calculations and reactivity control methods. Prereq: 470.  
494 Special Topics in Nuclear Engineering (3) Problems related to recent developments and practice. Prereq: Senior standing and consent of instructor. May be repeated. Maximum 6 hrs.  
500 Thesis (1-15) P/NP only. E  
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E  
511-12 Transport Processes in Nuclear Engineering (3,3) Rheology of Newtonian and non-Newtonian fluids; integral and system conservation equations for single and multi-component fluids; in-depth development of differential conservation equations for mass, energy, and momentum; exact and approximate solution of equations of motion; boundary layer analysis; numerical analysis of fluid flow and heat transfer.  
521 Nuclear Systems Dynamics and Control (3) Introduction to state variable methods for system dynamics and control analysis and application of these methods to nuclear plant dynamics, simulation and control problems.  
541 Reactor Fuel Management (3) Topics relative to core fuel management. Applicable topics in reactor physics, fuel depletion, isotope inventory, reactivity control and numerical methods. Prereq: 401.

543 Selected Topics in Nuclear Criticality Safety (3) Criticality safety computational and experimental methods for transportation, fabrication, storage, reprocessing, and transportation applications; overview of safety practices and regulatory requirements. Prereq: 421 or consent of instructor.

550 Radiation Measurements Laboratory (3) Physics and electronics associated with radiation detection and measurement, methods of data analysis. Applicability of particular detector measurements and fundamentals of radiation and imaging equipment. Prereq: 551.


552 Radiological Assessment and Dosimetry (3) Transport of radioactive nuclides in environment, food chain pathways, internal dosimetry and personnel dosimetry. Prereq: 551 or consent of instructor.

553 Radiation Risk Analysis (3) Methods for radiation risk prediction, risk analysis, parameter estimation, real data analysis, extrapolation techniques. Prereq: 552 or consent of instructor.


572 Nuclear System Design (3) Design and analysis of a nuclear system, interaction with non-nuclear aspects of system design: system reliability and economics; class project. Prereq: 571 or consent of instructor.

576 Expert Systems in Engineering (3) Application of expert systems in engineering: logic and rationale, developing expert systems, programming, advanced topics. Prereq: 575 or consent of instructor. (Same as Mechanical and Aerospace Engineering and Engineering Science 576.)

577 Neural Networks in Engineering (3) Neural network techniques in use in intelligent systems: rationale for neural computing, structure of neural computing systems, programming. Prereq: Consent of instructor. (Same as Mechanical and Aerospace Engineering and Engineering Science 577.)

578 Fuzzy Systems in Engineering (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.)

581 Reactor Shielding (3) Application of analytical/deterministic solutions of Boltzmann transport equation to shield design problems. Spherical harmonics, moments method, discrete ordinates, adjoint calculations, coupled analysis, and fast reactor shield design. Prereq: 401 or equivalent.


585 Process System Reliability and Safety (3) Qualitative and quantitative methods for assessing and improving process systems reliability and safety. Fault tree analysis and associated dependent failure analysis. (Same as Chemical Engineering 585.)

597 Special Topics in Nuclear Engineering (3) Lectures and recitation on recent advances in nuclear engineering. Prereq: Consent of instructor. May be repeated with consent of department.
3. Each student must present proof of hepatitis B vaccination and rubella and rubella immunization or sufficient titer for immunity; TB status.
4. Each student must present evidence of current 2-person CPR certification.
5. Non-registered nurse students must have completed courses in chemistry, nutrition, microbiology, anatomy, and physiology plus 12 hours of behavioral science courses.
6. Contact student services for more detailed information about the application process: Student Services/MSN Program, UTK College of Nursing, 1200 Volunteer Blvd., Knoxville, TN 37996-4180; phone: 423-974-7606.

**Thesis and Non-Thesis Options**

The thesis option is available for interested students and is especially encouraged for those who are considering pursuit of doctoral degrees sometime in the future. Students who choose the non-thesis option must register for 580 Nursing Project or 582 Supervised Research.

**Program Requirements**

All students must complete a minimum of 36 semester hours distributed as follows:

**Core (12 credits)**
- 503-04 Advanced Clinical Reasoning I, II 6
- 510 Theoretical Foundations of Nursing 3
- 520 Advanced Practice Nursing and Health Delivery Systems 3

**Research (9-12 credits)**
--- Graduate level statistics course 3
- 501 Nursing Research: Methods, Design & Analysis 3
- 500 Thesis 6
- 580 Nursing Project 3
- 582 Supervised Research 3

**Concentration (12-17 credits)—choose one**
- 530-31 Adult Health Nursing I, II 12
- 540-41-42 Family Nurse Practitioner I, II, III 17
- 550-51 Nursing of Women and Children I, II 16
- 550-52 Mental Health Nursing I, II 12
- 550-91 Nursing Administration I, II 12

**Elective (3 credits)—waived for those who choose thesis option except the family nurse practitioner concentration who take 505 and 515 and for nursing of women and children concentration who are required to take 505 and recommended to take 515.**

Students who enter the program as non-RNs must complete the following undergraduate nursing courses in addition to meeting the requirements listed above:

- 301 Clinical Pharmacology 3
- 302 Introduction to Professional Nursing 5
- 304 Nursing Assessment and Health Promotion 4
- 306 Health Deviation Concepts I 4
- 316 Health Deviation Concepts II 4
- 330 Nursing of Adults 6
- 414 Community Mental Health Nursing 6
- 415 Family/Community Health Nursing 6
- 431 Nursing of Children 4

Registered nurses whose bachelor's degrees are not in nursing must have completed courses in chemistry, nutrition, microbiology, anatomy, and physiology plus 12 hours of behavioral science courses. They must also complete 305, 392, 405, and 430 and complete or successfully challenge the following:

- 301 Clinical Pharmacology 3
- 304 Nursing Assessment and Health Promotion 4
- 306 Health Deviation Concepts I 4
- 316 Health Deviation Concepts II 4
- 330 Nursing of Adults 6
- 411 Family Health Nursing 6
- 411 Psychosocial Long Term Nursing 6
- 431 Nursing of Children 4

A total of 16-18 credits can be obtained by successful completion of the NLN Nursing Mobility Profile Examination. See undergraduate catalog for other challenge options. RNs are in the process of completing a BSN at UT with the intent of enrolling in the MSN program will take the following courses in addition to the core courses.

**Final Examination Requirements**

All students must successfully complete a final examination as required by The Graduate School. For thesis students, the examination will consist of an oral defense of the thesis as well as either written or oral questions designed to measure student mastery of the entire program of study. For non-thesis students, the written examination will cover the entire program of study and may, at the discretion of the student's committee, be followed by an oral examination.

**Special Policies**

1. If the clinical performance of any student for any course is found to be unsatisfactory, the student will receive a grade of "F" for the course.
2. If a student achieves a final grade of "D" or "F" for any required undergraduate or graduate nursing course, he or she will not be permitted to repeat the course and will be required to withdraw from the program.
3. If the clinical performance of any student is characterized by unethical, unprofessional or unsafe behavior, or behavior that places the client in jeopardy, the student will be required to withdraw from the program.

**THE DOCTORAL PROGRAM**

The College of Nursing offers a doctoral program leading to the Doctor of Philosophy degree with a major in Nursing. This is a unified program offered jointly with The University of Tennessee, Memphis, College of Nursing. Students must complete all or part of the program at either site. The dissertation must be completed in its entirety at one site.

The doctoral program prepares nursing scholars capable of integrating research, theory, and practice into their roles as researchers, educators, and/or administrators. Specifically, the graduate of this program should be able to:

1. Analyze, test, refine, extend, and expand the theoretical basis of nursing practice.
2. Conduct nursing research that generates knowledge and advances nursing as a discipline.
3. Provide leadership as nurse researchers, educators, and/or administrators in current and emerging health care settings.
4. Collaborate with members of other disciplines in health-related research of mutual concern.
5. Analyze, develop, and recommend health care policy at various levels.

**Admission Requirements**

1. Meet requirements for admission to The Graduate School.
2. Hold a master's degree in nursing from a program accredited by the National League for Nursing. Some outstanding applicants who are prepared at the bachelor's level in nursing may be considered. In such cases, graduate level courses in nursing theory, concentration specialty, and/or research will be integrated into the formal program of doctoral degree requirements.
3. Have a minimum cumulative graduate grade-point average of 3.3 on a 4.0 scale for previous college work.
4. Have a combined score of at least 1000 on the verbal and quantitative sections of the Graduate Record Examination.
5. Have successfully completed a basic statistics course and graduate nursing theory and research courses prior to enrollment in nursing doctoral level courses.
6. Have TOEFL scores of at least 550 if native language is not English.
7. Complete Graduate Program Data Form, College of Nursing.
8. Submit Graduate School Rating Forms from three college level instructors and/or nurses and administrators who have supervised applicant's professional work.
9. Submit a sample of scholarly writing (e.g., thesis, published paper).
10. Submit an essay describing personal and professional aspirations.
11. Submit Graduate Application for Admission, academic transcript(s), Graduate Record Examination scores, and, if required, TOEFL scores to the Graduate School. Submit three Graduate School Rating Forms, sample of scholarly writing, and Graduate Program Data Form with essay to the Director of the PhD program prior to November 1 of the year prior to fall admission.
12. Schedule a personal interview with the College of Nursing PhD Student Admissions Committee prior to March 15 of the year preceding Fall admission. International applicants may be interviewed by telephone or teleconferencing at the discretion of the admissions committee.

**Program Requirements**

The following courses are required for all students:

- 620 Directed Research
- 601-02 Theory Analysis & Construction I, II
- 605-06 Nursing Research Seminar
- 607 Qualitative Nursing Research
- 608 Quantitative Nursing Research
- 609 Research Practicum*
- 610 Nursing Science Seminar
- 611 Advanced Nursing Seminar
- 612 Health and Nursing Policy/Planning
- 614 Nursing Preceptorship
- Statistics
- Cognates
- Electives
- 600 Dissertation

TOTAL 72

*Note: A minimum of 1 hour per semester must be taken for 4 semesters.
Possible cognate areas include, but are not limited to, anthropology, child and family studies, psychology, education, management, medical ethics, public health, social work, philosophy, and statistics.

Doctoral Committee
Early in the student's program, a nursing faculty advisor will be selected by the student in consultation with the program director. The student's comprehensive examination committee consists of the faculty teaching core courses and one representative from the cognate area. The student then selects the dissertation committee. Five 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 two members of the committee must be from an academic unit other than nursing.

Special Policies
1. A maximum of 6 graduate hours taken before acceptance into the doctoral program may be applied toward the degree.
2. Minimum grades of B in all nursing doctoral courses and a 3.0 cumulative GPA are required for continuation in the program.

MINOR IN GERONTOLOGY
Graduate students in the College of Nursing may pursue a specialized minor in gerontology. This interdepartmental/interdisciplinary minor gives the student an opportunity for combining the knowledge about aging in American society with his/her major concentration. Please refer to Human Ecology for specific requirements.

ACADEMIC COMMON MARKET
An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The Ph.D. program in Nursing is available to residents of the states of Alabama, Arkansas, or West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES
500 Thesis (1-15) P/NP only, E
501 Nursing Research: Methods, Design, and Analysis (3) Basic principles of research process in application to clinical questions; critical evaluation of nursing and health-related research. Prereq or coreq: 510, 520, graduate level statistics, F, Sp
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC or letter grade.
503 Advanced Clinical Reasoning I (3) Principles of health promotion, education, and innovative strategies for achieving optimal wellness: health habits, psychological, and other dimensions of whole person as related to risks for lifestyle diseases. F
504 Advanced Clinical Reasoning II (3) Development of advanced clinical reasoning skills for assessment of client health status and wellness; health habits, psychological, and other dimensions of whole person as related to risks for lifestyle diseases. F
505 Advanced Clinical Pharmacology (3) Pharmacological agents utilized to treat common, recurrent health problems; indications, contraindications, side and interactive effects of commonly prescribed drugs. Prereq: 501 or equivalent or consent of instructor. F
510 Theoretical Foundations of Nursing (3) Historical evolution of nursing science; nursing's metaparadigm and selected philosophies, conceptual models and theories as they influence research, clinical training, critical thinking in analysis, reasoning, and decision making for advanced practice nursing. F, Sp
515 Advanced Pathophysiology for Nursing Practice (3) Advanced physiologic and pathophysiologic concepts, principles, and theories applied to deviations of human systems. Sp
520 Advanced Practice Nursing and Health Delivery Systems (3) Nursing's role in dynamic health care system: health policy and organizational, social, ethical, public, and economic perspectives and factors which impact advanced practice nursing and delivery of health care. Prereq: 504, Coreq: First course in concentration, Sp
530 Adult Health Nursing I (6) Advanced nursing practice for health promotion, restoration, and maintenance of young, middle-aged, and older adults. Prerequisites and research to advanced practice with individual clients in variety of settings. Prereq: 504, Prereq or coreq: 501, Coreq: 520, Didactic (2) and practicum (4). F, Sp
531 Adult Health Nursing II (6) Continuation of 530. Delivery, provision, and management of health care for adult groups and communities. Prereq: 530, Didactic (2) and practicum (4). F
540 Family Nurse Practitioner I (6) Nursing management and primary care for individuals and families in all developmental life stages; role refinement and exploration of major issues of family nurse practitioner; clinical experience in variety of settings. Prereq: 504, Coreq or coreq: 501, Coreq: 520, Didactic (2) and practicum (4). Sp
541 Family Nurse Practitioner II (6) Continuation of 540. Nursing management of chronic health problems of individuals and families in all developmental life stages; role refinement and exploration of major issues of family nurse practitioner; clinical experience in variety of settings. Prereq: 540, Didactic (2) and practicum (4). F
543 Nurse Practitioner (4) Exploration and application of holistic nursing concepts to nursing management of common and chronic health problems. Role refinement and exploration of major issues in delivery of holistic primary nursing care; interdisciplinary experiences emphasizing on student's intent to pursue certification as family or adult nurse practitioner. Prereq: MSN in clinical concentration, 504, or equivalent, and consent of instructor. 3 hours and 6 labs, Su
550 Nursing of Women and Children I (8) Advanced practice nursing for women and children; clinical experience in role of nurse practitioner or clinical nurse specialist in variety of settings. Health promotion and nursing interventions for actual and potential health problems of women, children, and families. Prereq: 504, Prereq or coreq: 501, Coreq: 520, Didactic (3) and practicum (5). Sp
551 Nursing of Women and Children II (3) Continuation of 550. Role refinement of nurse practitioner or clinical specialist in health maintenance and restoration for women, children, and families. Prereq: 504, Prereq or coreq: 501, Coreq: 520, Didactic (3) and practicum (5). Sp
557 Nurse Midwifery Seminar I (1) Exploration of art and science of midwifery, nature and scope of midwifery practice, professional and ethical issues in advanced nursing practice. Prereq or coreq: 501, 510, F
558 Nurse Midwifery Seminar II (1) Exploration of psychological, developmental, and sociocultural theories as related to individual and family patterns of illness and wellness. Role of nurse-midwife in advanced practice promoting well-being within clients and community. Prereq: 501, 510, 570, Coreq: 520, Sp
559 Nurse Midwifery Seminar III (1) Exploration of state of science in nurse midwifery, innovative practice options, and related researchable problems in nurse-midwifery practice. Prereq: 570, 571, Coreq: 500, 560 or 582, F
560 Mental Health Nursing I (6) Theories of advanced therapeutic interventions for clients experiencing actual and potential mental health problems; advanced practice nursing in specialty of mental health; clinical practice with clients of various ages in acute care and community settings. Prereq: 504, Didactic (2) and practicum (4). Sp
561 Mental Health Nursing II (6) Continuation of 560. Advanced practice nursing in community settings for families and groups with actual and potential mental health problems. Prereq: 504, Didactic (2) and practicum (4). F
565 Teaching Practicum (1-6) Individually designed teaching experience in collegiate nursing program or nursing practice setting. Objectives to be developed collaboratively by student and faculty. Prereq: 504 or coreq: 501. Coreq and consent of instructor, S/NC or letter grade. Sp
566 Educational Principles and Strategies (3) Exploration and analyses of selected education, curriculum, teaching-learning, measurement, and evaluation principles and theories as applied to instruction of undergraduate nursing students, staff development, and patient education. Prereq: Consent of instructor, Su
570 Family Nurse Practitioner I (4) Application of advanced health/physical assessment and diagnostic reasoning to nurse practitioner management and primary care and of individuals and their families with actual and potential acute health problems; clinical experience in role of family nurse practitioner in variety of settings. Prereq: 504, 515, Coreq: 520, Didactic (2) and practicum (2). Sp
571 Family Nurse Practitioner II (6) Continuation of 570. Nursing management and primary care of individuals and their families in all developmental life stages; clinical experience in variety of settings; role refinement and exploration of major issues of family nurse practitioner; clinical experience in variety of settings. Prereq: 571. Didactic (2) and practicum (5). Sp
577 Special Topics (1-3) Topic is determined by faculty and student interest. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E
580 Nursing Project (3) Student-initiated scholarly project with faculty supervision. Review and critical evaluation of literature in specialized area of advanced practice nursing; culminating in "state of the practice" paper. Prereq: Consent of instructor, first course in concentration, Su, F
582 Supervised Research (3) Supervised research culminating in scholarly paper. Experiential learning of research process. Participation in ongoing faculty research project. Project developed collaboratively by student and faculty. Prereq: Enrollment or completion of graduate level courses in clinical nursing. Maximum 9 hrs. S/NC or letter grade. E
590 Nursing Administration I (6) Exploration, analysis and application of selected organizational, management, and leadership theories and financial principles to delivery of nursing service. Administration, organization, and planning; conflict resolution, and organizational development with application to mid-level and top-level nursing administration positions. Prereq: 550. 2 hrs and 4 labs. F
591 Nursing Administration II (6) Continuation of 590. Utilization of human and financial resources, conflict resolution, and organizational development with application to mid-level and top-level nursing administration positions. Prereq: 550. 2 hrs and 4 labs. F
593 Independent Study (1-3) Prereq: Consent of instructor. May be repeated. Maximum 9 hrs, E
Nutrition

(College of Human Ecology)

MAJORS

Human Ecology ........................................ Ph.D.
Nutrition ............................................. M.S., M.S.-M.P.H.

Michael B. Zemel, Head

Professors:
Beauchene, Roy E. (Emeritus), Ph.D. ...................... Kansas State
Caruth, Betty Ruth, Ph.D. ............................... Missouri
Namey, T.C., M.D. ................................. Washington (St. Louis)
Sachan, Dileep S., Ph.D. ............................... Illinois
Skinner, Jean D., Ph.D. ................................ Oregon State
Smith, John T., (Emeritus), Ph.D. ........................ Missouri
Zemel, Michael (Lierson), Ph.D. ........................ Wisconsin

Associate Professors:
Bailey, James W., Ph.D. ............................... Iowa State
Brooks, M. D. (Memphis), M.S. ......................... Alabama
Haughton, B., Ed.D. ................................. Columbia
Karlstad, Michael, Ph.D. ............................... Loyola
Whelan, Jay, Ph.D. ................................. Penn State
Zemel, Paula, Ph.D. ................................. Wayne State

Assistant Professors:
Bittle, Joyce (Memphis), Ph.D. ........................ Tennessee
Chencherick, Judith (Memphis), M.S. ............... Maryland
Moustaid, Naima, Ph.D. ............................... Paris

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. Students may also select an interdisciplinary minor in gerontology.

ADMISSION REQUIREMENTS

A final file for review includes the Graduate School application file, completed departmental application form, Graduate Record Examination (GRE) scores for the general section, and three Graduate School Rating Forms completed by individuals who can attest to the applicant's potential for graduate education. Forms may be obtained from the Departmental Office, 220 Jessie Harris Building, University of Tennessee, Knoxville, 37996-1900. Forms may also be obtained from the Department's website at http://nutrition.ehc.utk.edu.

Admission to 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.

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, and the minor in public health. Six hours in one area outside the department are required. A minimum of 24 hours at the 500 and 600 level is required.

A written comprehensive examination is required for completion of the program.

DUAL M.S.-M.P.H. PROGRAM

The College of Human Ecology offers a coordinated dual program leading to the conferral of both the Master of Science with a major in Nutrition (public health nutrition concentration) and the Master of Public Health. The dual program allows students to complete both degrees in less time than would be required to earn both degrees independently.

The program is designed to meet the needs of students who are interested in the benefits of majors in both nutrition and public health. Therefore, it accommodates the interests of students who: 1) plan a career in public health nutrition and want to acquire the knowledge and skills of the nutritionist and public health professional; 2) plan a career in nutrition and want to acquire the knowledge and skills and the perspective of the public health professional; or 3) plan a career in public health and want to acquire the knowledge, skills and perspective of the nutritionist.

Admission Requirements

Applicants for the M.S.-M.P.H. program must make separate application to, and be competitively and independently accepted by, the Department of Nutrition for the M.S., Department of Health and Safety Sciences for the M.P.H., and the Public Health Academic Program committee.

Students who have been accepted by both departments may apply for approval to pursue the dual program anytime prior to, or after, matriculation in either, or both departments. Such approval will be granted, provided that dual program studies be started prior to entry into the fourth semester of the M.S. and M.P.H. programs.

Curriculum

A dual degree candidate must satisfy the requirements for both the M.S. (public health nutrition concentration) and the M.P.H. degrees, as well as the requirements for the dual program. All candidates for the dual degree must successfully complete Health and Society (PH 555), two credits of Seminar in Public Health (PH 559), 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, Leisure 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 of 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
Nutrition

GRADUATE COURSES

414 Nutrient-Drug Interactions (2) Nutrient effects on efficacy and toxicity of drugs: drug effects on absorption and metabolism of nutrients. Prereq: Fundamentals of Nutrition or equivalent. Sp,A

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

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

508 Culture, Food, and Nutrition (3) Food-related behavior of individuals and groups in United States. Socio-cultural, economic, and technological influences. Nutrition and food surveys, public policy. Prereq: Nutrition for Educators or Advanced Nutrition or consent of instructor. F,A

509 Graduate Seminar in Public Health (1) (Same as Public Health 509, Exercise Science 509, Nursing 509 and Social Work 509.)

511 Advanced Physiological Chemistry (4) Bioenergetics, flux control and hormonal interrelationships. Prereq: Advanced Nutrition or equivalent. F


513 Community Nutrition I (3) Orientation to community; assessment of nutrition problems, needs, and resources; functional roles of public health nutritionist. Prereq: Consent of instructor. F

514 Community Nutrition II (3) Planning, implementation, and evaluation of public health nutrition programs. Concurrent experience. Prereq: 513 and consent of instructor. Sp

515 Field Study in Community Nutrition (1-12) Field study to be selected in consultation with instructor. Prereq: 513, 514 and consent of instructor. S/NC only. Su

516 Maternal and Child Nutrition (3) Nutrition principles related to growth and development during pregnancy, infancy, and childhood to age 5. Prereq: Advanced Nutrition or consent of instructor. F

517 Childhood and Adolescent Nutrition (3) Application of nutrition principles to school-age children; effects of diseases on growth and health maintenance; nutritional assessment and counseling for nutrition. Prereq: Advanced Nutrition or consent of instructor. Sp,A

518 Nutrition and Aging (3) Nutritional problems of adults; nutritional requirements, dietary intake; effects of nutrition on biological aging. Prereq: Advanced Nutrition or consent of instructor. Su

520 Nutritional Ecology (2) Examination of issues in natural, political, physical, and social environments that impact availability of food and nutrients in U.S. food supply. F,A

521 Physiological Basis for Diet and Disease (2) Altered nutrient needs as result of metabolic changes that occur in selected disease states. Prereq: Nutrition in Disease or consent of instructor. Sp

522 Nutrition Counseling (2) Diet counseling, health habits and disorders, evaluation strategies for effectiveness of counseling. Prereq: Nutrition in Disease or consent of instructor. F,A

524 Nutrition Education: Principles, Implementation, and Evaluation (3) Conceptual models, principles, applications, and evaluation models in nutrition education research. Prereq: 508 or consent of instructor. Su,A

540 Seminar in Nutrition (1) May be repeated. S/NC only. E

541 Research Methods (1) Basic principles of planning, conducting, and interpreting nutrition and foodservice systems administration research. Prereq: 6 graduate hrs in nutrition and foodservice administration and statistics. Sp

542 Advanced Experimental Nutrition (2) Application of research principles to individual project using experimental animals. Prereq or coreq: 541. Sp

544 Nutrition and Hospitality Survey Methods (2) Application of survey research methodologies to nutrition and/or hospitality projects: assessment of food consumption, nutrient intake, nutritional status, socioeconomic-economic parameters, food production and service, and human resource management issues. Prereq or coreq: 541. Sp

547 Field Experience (1-9) Experience in food-related industry or agency under supervision of faculty member. Prereq: Consent of instructor. S/NC only. E

548 Directed Study in Nutrition (1-3) Advanced study in nutrition. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

549 Special Topics (1-3) Recent advances in nutrition or food systems administration. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

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

602 Advanced Topics in Nutrition Science (1-3) Comprehensive individual study and group discussion of topics related to current problems in nutrition. Prereq: 512 or consent of instructor. May be repeated. F

603 Current Trends in Food and Sociocultural Change (2) Critical evaluation of research. Prereq: 508 or consent of instructor. F,A

Ornamental Horticulture and Landscape Design

(College of Agricultural Sciences and Natural Resources)

MAJOR DEGREE

Ornamental Horticulture and Landscape Design......................... M.S.

Mary L. Albrecht, Head

Professors:

Albrecht, M. L., Ph.D............. Ohio State

Callahan, L. M., Ph.D........... Rutgers

Crater, G. Douglass, Ph.D..... Ohio State

Graham, E. T. (Emeritus), Ph.D..... Penn State

Gresshoff, Peter M. (Racheff Chair of Excellence), Ph.D........ Australian National

McDaniel, G. L., Ph.D........ Iowa State

Trigiano, R., Ph.D............. NC State

Williams, D. B., Ph.D........... Penn State

Associate Professors:

Auge, R. M. (Liaison), Ph.D..... Washington State

Day, J. W., Ph.D............. Mississippi State

Rogers, S. M., M.L.A........ North Carolina

Starman, T. W., Ph.D........ Texas A&M

Witte, W. T. (Liaison), Ph.D........ Maryland

Assistant Professor:

Hamilton, S. L., Ed.D........ Tennessee

Menendez, G. L., M.S......... Tennessee

The Department of Ornamental Horticulture and Landscape Design offers the Master of Science degree with concentrations in floricultural science and technology, nursery science and technology, turfgrass science and technology. Various interests may be emphasized in any of these commodity areas, including micropropagation, innovative production and maintenance systems, computer-aided management systems, and the molecular biology, genetics, and stress physiology of ornamentals.

For admission, the student must have a B.S. in ornamental horticulture, horticulture, plant science, or a related agricultural or biological science discipline. Undergraduate transcripts must be evaluated by the department for prerequisite requirements, if any. Graduate research assistantships are available on a competitive basis. For further information, contact the department head.

THE MASTER'S PROGRAM

Thesis Option

1. A thesis is required. A master's committee of no fewer than 3 faculty members will be selected. Prior to research for the thesis, a proposal must be approved by the master's
committees. Registration for 6 hours of Thesis 500 is required.

2. In addition to the thesis requirement, a minimum of 24 hours of graduate credit is required. No more than 10 hours of the minimum 30 hours can be below the 500 level. The academic program must be approved by the master's committee which may require additional course work if the student's progress or background indicates such need. All students are required to include 2 hours of Seminar 590 in their program and are expected to attend this course and participate in discussions each semester enrolled.

4. Twelve hours of coursework in the major must be at the graduate level, exclusive of Thesis 500. Six of these hours may be satisfied by Botany 412, 521, 522, Plant and Soil Science 471, or Animal Science 571.

5. An oral examination covering the thesis and coursework is required.

Non-Thesis Option

1. A master's committee of no fewer than 3 faculty members will be selected.

2. Thirty-four hours of graduate coursework are required of which 22 hours must be at the 500 level or above.

3. All students are required to include 2 hours of Seminar 590 in their program and are expected to attend this course and participate in discussions each semester enrolled.

4. Twelve hours of coursework in the major must be at the graduate level. Six of these hours may be satisfied by Botany 412, 521, 522, Plant and Soil Science 471, or Animal Science 571.

5. Final comprehensive written or oral examinations shall be taken upon completion of no fewer than 32 hours of approved graduate work.

GRADUATE COURSES

410 Nursery Management and Production (3) Modern management methods as applied to retail and wholesale nurseries and landscape contracting firms. Methods of producing and marketing woody ornamental plants. Prereq: 220, 330, and Plant and Soil Science 210, or consent of instructor. 3 hrs and 1 lab. Sp

440 Advanced Turfgrass Management (4) Principles and scientific basis of turfgrass culture: adaptation, ecology, physiology, and soil and water nutrition, climate influences on grass culture, physiology of clipping and water management; design, construction, and management of golf courses; and biological influences of pest infestation and control measures. Prereq: 340 or consent of instructor. 3 hrs and 1 lab. Sp

451 Plant Tissue Culture (3) (Same as Botany 451.)

460 Professional Practices in Landscape Construction and Management (2) Professionalism, salesmanship, proposals, bidding, estimating, specification, and contract management in landscape services industry. Interaction with industry representatives through special presentations. Prereq: 350 or consent of instructor. F

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: Fundamentals of Landscape Design, Basic Landscape Construction, and Supplemental Landscape Design Graphics. 3-2 hrs. Labs. Sp

485 Computer Aided Landscape Design (3) Computer Aided Design (CAD) related to landscape design and construction. Site planning and construction of related landscape plan view and sectional drawings. Operating system, use of AutoCAD and LANDCAD software. Prereq: Fundamentals of Landscape Design, Microcomputer Applications to Problem Solving or consent of instructor. 2-3 hrs. Labs. F,Sp

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

501 Special Topics in Ornamental Horticulture and Landscape Design (1-3) Topics to be assigned. May be repeated. Maximum 6 hrs. Prereq: Consent of instructor. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses 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 Development Seminar (1) (Same as Agriculture 507, Biosystems Engineering 507, Biosystems Engineering Technology 507, Animal Science 507, and Plant and Soil Sciences 507.) S/NC only. F

509 Scientific Communication (1) (Same as Agriculture 509, Animal Science 509, and Plant and Soil Sciences 509.)

511 Plant Diseases (4) (Same as Entomology 510.)

512 Stress Physiology (1) Introduction to abiotic plant stress physiology: drought, flooding, salinity, light, pollutants, and other stresses. Prereq: Introductory Plant Physiology or equivalent. 3 hrs weekly for 5 weeks. Sp,A

523 DNA Analysis (1) Practical experience in isolating Genomic DNA from plants and fungi, amplification of DNA using arbitrary oligonucleotide primers. DNA profiling techniques (DAF, ASAP) isolation and purification of amplified products. Data analysis of relationships between organisms. Prereq: 6 hrs biological/botanical sciences, 8 hrs chemistry, consent of instructor. 1 hr and 4 labs weekly for 5 weeks. Sp,A

524 Plant Cell Electrophoresis (1) Practical experience with isolating native and mutated proteins from plants and fungi determining protein concentrations. PAGE of proteins including total protein 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. Sp,A

525 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. Sp,A

570 Physiology and Development of Ornamental Plants (3) Basic and applied physiology of ornamental plants related to growth and development in production and utilization. Critical review of literature and discussion of phytochrome and phase change, flowering, photoperiodism, thermoperiodism, photomorphogenesis, environment stress, and post-harvest consideration. Prereq: Botany 321 and consent of instructor. Sp,A

590 Seminar (1) Current literature and developments. May be repeated. Maximum 3 hrs. E

593 Problems in Ornamental Horticulture and Landscape Design (3) Independent study. Current topic related to technology and science. May be repeated. Maximum 6 hrs. E

Pathology
See College of Veterinary Medicine and Comparative and Experimental Medicine

Philosophy

(College of Arts and Sciences)

MAJOR

Philosophy................................. M.A., Ph.D.

DEGREES

Philosophy.................................... M.A., Ph.D.

Kathleen Bohstedt, Head

Professors:

Aquila, Richard E., Ph.D............... Northwestern
Brenkert, George G., Ph.D.............. Michigan
Cebik, L. B., Ph.D......................... Nebraska
Cohen, Sheldon M., Ph.D............... Northwestern
Davis, John W. (Emeritus), Ph.D....... Emory
Edwards, Rem B. (Emeritus), Ph.D.... Emory
Graber, Glenn C., Ph.D.................. Michigan
Helwani, Jhonna J., Ph.D.............. SUNY (Buffalo)
Postow, Betsy C., Ph.D................. Yale
Van de Vate, Dwight, Jr., Ph.D....... Yale

Associate Professors:

Bennett, James O., Ph.D.............. Tulane
Bohstedt, Kathleen Emmett (Liaison), Ph.D........ Ohio State
Holt, John E., Ph.D................. Ohio State
Osborne, Martha Lee, Ph.D........... Tennessee

Assistant Professor:

Hamlin, H. Phillips, Ph.D............ Georgia
Kaplen, Jonathan, Ph.D.............. Stanford

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. Twenty-seven hours of coursework beyond the M.A. is required, of which 6 hours will be in courses numbered above 600. See the Philosophy Department Graduate Studies Procedures for specific course requirements.

Students must demonstrate a reading knowledge of one foreign language, normally a living language in which there exists a signifi-
concentration on the content, name, and contact information provided in the text. The text is provided in a clear and organized format, making it easy to read and understand. The content covers a wide range of topics, including philosophy, ethics, and medical ethics. The text is written in a formal and academic style, with references to specific courses, instructors, and institutions. The text is well-organized and divided into sections, making it easy to navigate and find specific information. Overall, the text is a valuable resource for anyone interested in studying philosophy or related fields.
The department offers an M.S. thesis program with a concentration in geophysics. Program requirements are: 12 hours from Physics 531-32, 541-42, 571-72; a minimum of 12 additional hours in geology, geophysics, and/or physics, as approved by the student's committee; and the presentation of an acceptable thesis, 6 hours of Physics 500, and the passing of an oral examination on course material and thesis.

**Non-Thesis Option**

This program is designed primarily for students intending to teach in colleges or universities on the elementary or intermediate level, or for students specifically intending to work toward a Ph.D. Students seeking the non-thesis option must apply to the department's graduate committee for permission to enroll under this program. The requirements are the satisfactory completion of 30 hours of coursework, composed of 18 semester hours from Physics 511-12, 521-22, 531-32, 541-42, and 571-72; 6 semester hours in a minor field; and 6 semester hours from other courses numbered above 400 (preferably of advanced laboratory nature). At least 20 hours must be taken at the 500 level or above. In addition, the candidate must pass the written examination administered by his/her committee.

**THE DOCTORAL PROGRAM**

All students are expected to take Physics 521-22, 531-32, 541-42, 551, 571-72, and 611. Physics 601-02 are normally required of students specializing in atomic physics; Physics 621-22 of students in nuclear physics; Physics 625-27 of students in elementary particle physics (and/or Physics 613-14 for students specializing in theoretical high-energy physics); Physics 671-72 of students in condensed matter and surface physics; and Physics 681-82 of students specializing in molecular spectroscopy. Students specializing in chemical physics may substitute Chemistry 572 for Physics 551, and should complete at least 6 semester hours from Chemistry 580, 670.

The courses Physics 531-32, 571-72, 521-22, 541-42 constitute the core curriculum. They are the usual basis for the departmental comprehensive examination which is normally taken by a well-prepared student after two years of graduate study.

The dissertation topic will be chosen with reference to one of the fields in which research facilities can be made available either at The University of Tennessee laboratories in Knoxville, The University of Tennessee Space Institute at Tullahoma, Tennessee; the Oak Ridge National Laboratory, Oak Ridge, Tennessee; or at other research facilities used by the University faculty.

**Astronomy**

**GRADUATE COURSES**

**411 Astrophysics (3)** Development of analytical physical models of galactic structure of universe, stellar and interstellar matter, and planetary systems. Topical and interdisciplinary consideration of quasars, pulsars, black holes and current developments in field. Acceptable for major credit in physics. Prereq: Physics 232 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.
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 Graduate School, and two letters of reference from faculty familiar with their prior academic work and a statement describing personal career objectives directly to the School of Planning. If the applicant has prior work experience in planning, a reference letter should also be provided by the work supervisor. Graduate Record Examination scores are required of all applicants whose undergraduate GPA is below 3.0. Other applicants are encouraged to submit them. Students who have not taken an appropriate undergraduate statistics course will be required to take one as part of their graduate program.

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, 511, 512, 515, 520, 521, 530, 531, 532, 540 and 570.

Students should plan to enter the program in the fall term to take core courses in the proper sequence.

Each student is required to develop an area of concentrated competence beyond the core curriculum. After selecting the area of concentration, usually by the end of the second semester, the student takes a minimum number of courses or hours from a prescribed set of courses in the subject area. Further enhancement of the concentration is gained by focusing the thesis or major paper on the subject.

Concentration courses are drawn from the planning curriculum and from other departments in the University. Concentrations are available in land use planning, environmental planning, real estate development planning, and transportation planning.

Students have the latitude to propose an alternate specialization consisting of at least 9 hours of coursework, subject to approval of a faculty committee.

Each student is required to demonstrate competence in individual research. This may be done in one of two ways:

**Thesis Option** – Complete a thesis for 6 hours credit;

**Non-Thesis Option** – Complete a major study with acceptable documentation. To be eligible for the major study option, the student must have completed at least 12 hours of graduate coursework in planning with at least a 3.5 cumulative grade-point average. The student meeting these criteria may present a proposal to his/her committee for a major study that will include at least 6 hours of subsequent coursework. The proposal shall justify the selection of the topic, describe the approach to the study, and describe the nature of the final product. The topic will normally be expected to reinforce or complement the student's concentration.

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.

**ACADEMIC COMMON MARKET**

An agreement among southern states for sharing graduate programs among legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The M.S.P. program is available to residents of the states of Arkansas, Kentucky, or West Virginia.

Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

**GRADUATE COURSES**

401 The City in the U.S. (3) Development and character of U.S. cities. Contemporary issues and selected case studies. (Same as Urban Studies 401.)


446 Housing (3) Nature and demand for housing in U.S. and abroad; U.S. experience. Private market processes and public influences. Problems of change in housing supply, impact of new technology, and governmental programs to improve supply and quality of housing.

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


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

510 Fundamentals of Planning (2) History of planning, structure and development of urban areas, operations of contemporary planning, trends and issues.

511 Graphic and Oral Communications in Planning (1)

512 Community Planning Process (3) Planning process, policy process and development process. Field reconnaissance of study community and development of approaches for assessing community.

515 Theory of Planning (2) Analysis of nature and objectives of planning process, role of planner and planning function in public decision-making. Prereq: 510 or consent of instructor.

520 Planning Research Methods (3) Overview of planning practice and role of planning as a part of the professional process. Prereq: 520 or consent of instructor.

521 Information Systems and Networks in Planning (3) Use and impact of computer-based information systems and global networks in planning and public management.

522 Planning and Property Development (3) Process of developing real estate markets and property development. Prereq: 520 or consent of instructor.

523 Statistics for Planners (3) Applications of statistical techniques. Intuitive explanations and practical applications. Computer analysis to explore concepts.

525 Planning Information Systems (3) Design, analysis, and design of information systems for planning and local government. Development of design decision-support systems; use of public data bases; impact of information revolution and new technologies on planning profession. Prereq: Consent of instructor.

526 Library Research for Planning (1) Survey of publications of interest to planners, resources and research techniques. Use of facilities and collections of library.

530 Policy and Land Use Analysis (4) Basic methods of policy analysis and planning, implementation, negotiation, and design and development of planning programs. Prereq: 526 or consent of instructor.

531 Urban and Regional Analysis (3) Past, present and possible future patterns of urban and regional structures. Drawing on current theories, models, and empirical research.

532 Planning Methods (4) Preparation of comprehensive plans for urban areas or regions. Development of base data and forecasts, formulation of alternative plans and strategies, and development of plan implementation programs. Extensive laboratory experience. Prereq: 510, 512, 520, 530 and 531 or consent of instructor.

537 Planning and Transportation (3) (Same as Civil Engineering 558.)

538 Urban and Site Design (3-6) Principles of design of residential subdivisions and some components of physical community, shopping centers, institutional complexes, central business districts. Problems of reviewing alternative design against each or both written guidelines and prescribed standards. Extensive laboratory experience.

539 Planning for Historic Preservation (3) Planning for preservation, restoration, and conservation of historic buildings, areas and sites as related to comprehensive planning process, National, State, and local government role in preservation, designation of sites, legislative needs, financing and administrative organizations.

540 Legal Aspects of Planning (3) Legal basis for planning and guiding community development. Legal tools in planning. Prereq: 510 or consent of instructor.

543 Cultural Resources Planning (3) Cultural characteristics of sites, historic objects, role in environmental and land-use planning; use of protection in national environment and cultural heritage. Cultural components of National Environmental Protection Act and case studies.

545 Planning and Property Development (2) Process of urban physical growth and change; functioning of private sector real estate development and its relationship to planning, Partnership between public and private sectors in urban development and redevelopment. Prereq: 510 or consent of instructor.

547 Negotiation (1) Methods, strategies, techniques and skills useful to planners in mediation, negotiation, and dispute resolution concerning urban and transportation planning.

548 Tourism Planning (3) Planning of tourist resources and programs within a geographic region. Tourism planning models, relationships among tourist areas, tourism developments and planning of tourist attractions and services. Application of techniques in selected areas.

549 Local Fiscal Planning and Capital Improvements (3) Fiscal planning and capital improvements planning in relation to fiscal planning models and multicriteria (alternative revenue sources: development fees, excise taxes, infrastructure financing, municipal bond market, alternative revenue sources: development fees, excises, intergovernmental aid. Evaluation of fiscal policies.

550 Economic Development Planning (3) Planning for economic change in urban and regional areas. Institutional and organizational problems. Economic development planning process.

551 State and Regional Planning (3) Theory and practice of planning at state, sub-state, and metropolitan levels.
Plant and Soil Sciences

(College of Agricultural Sciences and Natural Resources)

MAJOR

Plant and Soil Science M.S., Ph.D.

Fred L. Allen, Head

Professors:

Allen, Fred L., Ph.D. .................... Minnesota
Ammons, J. T., Ph.D. .................... West Virginia
Ball, Frank F. (Emeritus), Ph.D. ...... Iowa State
Coffey, D. L., Ph.D. ..................... Purdue
Conger, B. V. (Distinguished Prof.), Ph.D. ............... Washington State
Deyton, D. E. (Liaison), Ph.D. ........... NC State
Duk, B. N., Ph.D. ....................... Auburn
Foss, John E. (Emeritus), Ph.D. ....... Minnesota
Fribouly, Henry A., Ph.D. .............. Iowa State
Hayes, R. M., Ph.D. ..................... Illinois
Howard, D. F., Ph.D. ................. Auburn
Lewis, R. J. (Emeritus), Ph.D. .......... NC State
Miller, R. D., Ph.D. .................... Kentucky
Mullins, C. A., Ph.D. .................. Tennessee
Parks, William L. (Emeritus), Ph.D. ....... Purdue
Raymonds, John H., Ph.D. ............. Wisconsin
Sams, C. E., Ph.D. ..................... Michigan State
Springer, M. E. (Emeritus), Ph.D. ...... California
Swingle, H. D. (Emeritus), Ph.D. ...... Louisiana State
Tyler, D. D., Ph.D. .................... Kentucky
West, D. R., Ph.D. ..................... Nebraska

Associate Professors:

Essington, M. E., Ph.D. ............. California (Riverside)
Gawthamey, C. O., Ph.D. ............ California (Davis)
Lessman, Gary M., Ph.D. .......... Michigan State
Logan, Joanne, Ph.D. ............... Nebraska
Mueller, Thomas C., Ph.D. .......... Georgia
Mullen, M. D., Ph.D. .................... NC State

Reich, V. H., Ph.D. .................. Iowa State
Wyatt, J. E., Ph.D. .................... Florida

The Department of Plant and Soil Sciences offers graduate programs leading to the Master of Science and the Doctor of Philosophy. Concentrations for the graduate programs are offered in soil science, plant breeding and genetics, and crop physiology and ecology. For further information, contact the department head.

THE MASTER'S PROGRAM

Thesis Option

This option requires writing a thesis based on original research. Six hours of 500 Thesis courses are required. Prior to conducting research, the student must develop a detailed written research plan. In addition to the thesis hours, a minimum of 24 hours of graduate coursework is required, of which at least 14 must be taken in courses numbered 501 and above. The student's advisory committee may require additional coursework if the student's progress or background indicates such need. Each student is required to take 1 hour of 501 and 1 hour of 503, and to present an oral seminar on the thesis research.

The student's advisory committee consists of the major professor, who acts as chairperson of the committee, and a minimum of two other faculty members. The advisory committee approves the student's research problem and coursework and conducts the final oral examination integrating the thesis and coursework.

A student having started on the thesis option is not eligible to transfer to the non-thesis option after the end of the first semester of graduate studies or after having received a Graduate Research Assistantship stipend for more than one semester. A student having started on the non-thesis option may transfer to the thesis option upon approval of a potential major professor and the Department Head.

Non-Thesis Option

A student desiring the non-thesis option should declare this intention at the beginning of the first semester of graduate studies, and must declare it before the beginning of the second semester. In lieu of a thesis, students are required to complete 3 hours of 593 for satisfactory participation in a single research program for a period of 12 weeks and the writing of an original, creative and well-written report, both to be conducted by the major professor and approved by the advisory committee. In addition to 3 hours of 593, a minimum of 30 hours of graduate coursework is required, of which at least 20 must be taken in courses numbered 501 or above, for a total of 33 hours.

The student's advisory committee may require additional coursework if the student's progress or background indicates such need. Each student is required to take 1 hour of 501 and 2 hours of 503.

The student's advisory committee consists of the major professor, who acts as chairperson of the committee, and a minimum of two other faculty members. The advisory committee approves the student's coursework and the report on participation in a research program for 593. Students are required to take a written comprehensive examination integrating the coursework.

THE DOCTORAL PROGRAM

A minimum of 72 hours beyond the Bachelor's degree, exclusive of credit for Thesis 500, is required. Of this number, 24 hours must be Doctoral Research and Dissertation 600. A minimum of 26 hours must be completed in courses numbered above 500 exclusive of doctoral research and dissertation, of which 6 must be in courses numbered above 600. A minimum of 9 hours of graduate coursework taken during the doctoral program must be outside the department in one or more cognate areas.

The student and the major professor identify a doctoral committee composed of at least four faculty members holding the rank of assistant professor or above, three of whom, including the chair, must be approved by the Graduate Council to direct doctoral research. At least one member must be from outside the department. The committee must approve all coursework applied toward the degree, certify the student's mastery of the major field and any cognate fields, direct the research, and recommend the dissertation for approval and acceptance by The Graduate School.

GRADUATE COURSES

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

413 Soil Chemistry (3) Composition and chemical properties of soils and processes that govern fate and behavior of chemicals in soil environment. Clay mineralogy; soil organic matter; mineral weathering and stability; aqueous speciation; surface chemistry; ion exchange, sorption, and molecular retention; oxidation-reduction, and soil acidity, alkalinity, and salinity. Prereq: Soil Science and Introduction to Organic and Biochemistry or Organic Chemistry or equivalent. F

414 Soil, Land Use, and the Environment (3) Soil as environmental component and soil properties affecting land use. Soil as resource in development planning: consideration of nonengineering aspects of soil selection for land use, soil survey and resource data in land use, recognition and prevention of soil pollution. Prereq: 210 or consent of instructor. Sp, A

415 Soil Hydrology (3) Physical relationships among solid, liquid, and gaseous phases of soil system; relationships of soil properties to processes governing transport of water, and chemicals in soil. Prereq: Soil Science 2 hrs and 1 lab. F, A

421 Physiology and Ecology in Agroecosystems (3) Plant physiology and ecology applied to crop production and management. Plant physiology and ecology principles related to crop production practices from seedling to harvesting and handling; interaction of crops with environment and sustainable agroecosystems. Prereq: Crop Science 2 hrs and 1-2 hr lab. F

432 Bioclimatology (3) Solar energy budget; interactions between global, regional and local climates and biological systems: quantification of macro- and microclimates; microclimates and their modification; automated weather station data collection and analyses; biological responses to climatic stresses; climate variation and change and their effects on biological systems. Prereq: 1 yr physical or biological science, junior standing. F, A

433 Agricultural Pesticides (3) Regulation of pesticide development, manufacture, transportation, marketing and use. Structure, use, mode of action, degradation and environmental impact of pesticides used in agriculture, forestry and related areas. Prereq: 1 yr biological sciences and 1 semester chemistry. 2 hrs and 1 lab. Sp

434 Fruit and Vegetable Crops (3) Principles of production systems to counter environmental stresses and to increase productivity of warm and cool season vegetable crops, small fruit crops, and deciduous tree fruit crops. Storage of crops after harvest. Prereq: Introduction to
Field and Forage Crops (3) Agronomic principles of crop production and management. Crop improvement, crop geography, cropping systems, site preparation, soil management, harvest, and utilization of major forage crops.
Prereq: Crop Science and World Crop. 2 hrs and 1 lab. Sp.

Principles of Plant Breeding (3) Genetic principles and techniques used in crop improvement. Consideration of the role of seed production systems and the application of the techniques to the improvement of crop production. Prereq: Biodiversity, Germplasm Conservation and Plant Improvement. 471, and General Genetics. 2 hrs and 1 lab. Sp.

Statistics for Biological Research (3) Descriptive statistics, probability, binomial distribution, confidence intervals, chi-square tests, analysis of variance, mean separation procedures, linear regression and correlation. Prereq: Mathematics 121 or equivalent. F.

Seminar (1-15) May be repeated. Maximum 3 hrs. F, Sp, N.

Pedology (3) Physical and chemical weathering processes, factors of soil formation, soil forming processes. Prereq: 412 or consent of instructor. 2 hrs and 1 lab. FA.


Pedology (3) Physical and chemical weathering processes, factors of soil formation, soil forming processes. Prereq: 412 or consent of instructor. 2 hrs and 1 lab. Sp.

Advanced Crop Ecology (3) General and specific relations between environment factors, crop organisms, and agricultural systems: quantification of microclimate, soil, water, and management. Prereq: 471 or equivalent. 431 or equivalent, or Agricultural Climatology or equivalent. 2 hrs and 1 lab. F.

Advanced Plant Breeding (3) Development and utilization of concepts of quantitative genetics, inbreeding, heterosis, methods of selection, in vitro breeding, interspecific hybridization, stability parameters, genetic resistance and vulnerability to pests and environmental stresses. Prereq: 453 and 571 or equivalent of consent of Instructor. 3 hrs and 1 lab. Sp.

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

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

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

Special Topics In Soil Science (1-3) Thermodynamics of soil solutions, clay structure and surface chemistry, soil mineralogy, soil plant mineral nutrition, soil microbiology, water movement and use by plants, soil structure, soil thermal properties, interaction in the soil plant environment. May be repeated. Maximum 6 hrs. E

Special Topics In Crop Physiology and Ecology (1-3) Microclimate of agroecosystems, crop and responses to stress, physiology of crop growth and reproduction. Interaction of genetic and environment in crop production, theory and application of quantitative methods in crop physiology and ecology research. May be repeated. Maximum 6 hrs. E

Special Topics In Plant Breeding and Genetics (1-3) Genotype by environment interactions, estimation of quantitative parameters, mutants, chromosome dynamics, polyploidy, genetic engineering, interspecific hybridization, linkage, screening methods, genome organization. May be repeated. Maximum 6 hrs. E

Advanced Crop Ecology (3) General and specific relations between environment factors, crop organisms, and agricultural systems: quantification of microclimate, soil, water, and management. Prereq: 471 or equivalent. 431 or equivalent, or Agricultural Climatology or equivalent. 2 hrs and 1 lab. F.


Pedology (3) Physical and chemical weathering processes, factors of soil formation, soil forming processes. Prereq: 412 or consent of instructor. 2 hrs and 1 lab. Sp.

613 Advanced Soil Chemistry (3) Thermodynamics of soil solutions and surface chemistry of soils: soluble complex formation, general solubility, electrochemical equilibria, geochemical and microbial processes, surface chemistry, surface functionality and reactivity, adsorption phenomena, and soil complexation modeling. Prereq: 413 or equivalent and Chemistry 473 or consent of instructor. Sp.

623 Plant Growth Control and Herbicide Action (3) Principles of uptake, translocation, mode of action and uses of herbicides and plant growth regulators and their effects on plant morphology, metabolic systems and enzymatic activities. Practical aspects and current commercial use of plant growth regulators. Prereq: Botany 521 and 522 or equivalent. F, A.

653 Advanced Plant Breeding (4) Development and utilization of concepts of quantitative genetics, inbreeding, heterosis, methods of selection, in vitro breeding, interspecific hybridization, stability parameters, genetic resistance and vulnerability to pests and environmental stresses. Prereq: 453 and 571 or equivalent of consent of Instructor. 3 hrs and 1 lab. Sp.

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

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

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

Special Topics In Soil Science (1-3) Thermodynamics of soil solutions, clay structure and surface chemistry, soil mineralogy, soil plant mineral nutrition, soil microbiology, water movement and use by plants, soil structure, soil thermal properties, interaction in the soil plant environment. May be repeated. Maximum 6 hrs. E

Special Topics In Crop Physiology and Ecology (1-3) Microclimate of agroecosystems, crop and responses to stress, physiology of crop growth and reproduction. Interaction of genetic and environment in crop production, theory and application of quantitative methods in crop physiology and ecology research. May be repeated. Maximum 6 hrs. E

Special Topics In Plant Breeding and Genetics (1-3) Genotype by environment interactions, estimation of quantitative parameters, mutants, chromosome dynamics, polyploidy, genetic engineering, interspecific hybridization, linkage, screening methods, genome organization. May be repeated. Maximum 6 hrs. E

Advanced Crop Ecology (3) General and specific relations between environment factors, crop organisms, and agricultural systems: quantification of microclimate, soil, water, and management. Prereq: 471 or equivalent. 431 or equivalent, or Agricultural Climatology or equivalent. 2 hrs and 1 lab. F.


Pedology (3) Physical and chemical weathering processes, factors of soil formation, soil forming processes. Prereq: 412 or consent of instructor. 2 hrs and 1 lab. Sp.

Advanced Crop Ecology (3) General and specific relations between environment factors, crop organisms, and agricultural systems: quantification of microclimate, soil, water, and management. Prereq: 471 or equivalent. 431 or equivalent, or Agricultural Climatology or equivalent. 2 hrs and 1 lab. F.

Advanced Plant Breeding (3) Development and utilization of concepts of quantitative genetics, inbreeding, heterosis, methods of selection, in vitro breeding, interspecific hybridization, stability parameters, genetic resistance and vulnerability to pests and environmental stresses. Prereq: 453 and 571 or equivalent of consent of Instructor. 3 hrs and 1 lab. Sp.

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

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

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

Special Topics In Soil Science (1-3) Thermodynamics of soil solutions, clay structure and surface chemistry, soil mineralogy, soil plant mineral nutrition, soil microbiology, water movement and use by plants, soil structure, soil thermal properties, interaction in the soil plant environment. May be repeated. Maximum 6 hrs. E

Special Topics In Crop Physiology and Ecology (1-3) Microclimate of agroecosystems, crop and responses to stress, physiology of crop growth and reproduction. Interaction of genetic and environment in crop production, theory and application of quantitative methods in crop physiology and ecology research. May be repeated. Maximum 6 hrs. E

Special Topics In Plant Breeding and Genetics (1-3) Genotype by environment interactions, estimation of quantitative parameters, mutants, chromosome dynamics, polyploidy, genetic engineering, interspecific hybridization, linkage, screening methods, genome organization. May be repeated. Maximum 6 hrs. E

Advanced Crop Ecology (3) General and specific relations between environment factors, crop organisms, and agricultural systems: quantification of microclimate, soil, water, and management. Prereq: 471 or equivalent. 431 or equivalent, or Agricultural Climatology or equivalent. 2 hrs and 1 lab. F.


Pedology (3) Physical and chemical weathering processes, factors of soil formation, soil forming processes. Prereq: 412 or consent of instructor. 2 hrs and 1 lab. Sp.

Advanced Crop Ecology (3) General and specific relations among environmental factors, crop organisms, and agricultural systems: quantification of macro- and microclimatic influences on crop growth; the role of logistics, crop distribution and productivity, human cultures, and their interaction. Prereq: 471 or equivalent; 431 or equivalent, or Agricultural Climatology or equivalent. 2 hrs and 1 lab. F.

Advanced Plant Breeding (3) Discovery of genetics: controlling elements, induced mutations, genome organization, polyploidy, tetrasomic inheritance, extrachromosomal inheritance, apomixis, incompatibility systems, and genetic engineering of higher plants. Prereq: Biology 220. F.


Design and Analysis of Biological Research (3) (Same as Animal Science 571.)
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: 539 State and Local Government; 540 Public Law; 546 Law and the Administrative Process; 548 Public Policy Process; 559 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. Possible specializations include general government, public health, budgeting and finance, planning, natural resources, program evaluation, criminal justice, public relations, personnel, and others.
   2. Recommended Internship (6 hours) Internships are arranged in consultation with the coordinator of the M.P.A. degree program.

3. Final Examination
   A written final examination, which may be followed by an oral examination, is required.

DUAL J.D.-M.P.A. PROGRAM

The College of Law and the Department of Political Science in the College of Arts and Sciences offer a coordinated dual degree program leading to the conferral of both the Doctor of Jurisprudence and Master of Public Administration degrees. In this program, a student may earn the M.P.A. and J.D. degrees in about four years rather than the five years that otherwise would be required. Students pursuing the dual degree program should plan to be enrolled in coursework or an internship for one summer term in addition to taking normal course loads for four academic years.

Admission

Applicants for the J.D.-M.P.A. program must make separate application to, and be independently accepted by, the College of Law for the J.D. degree and the Department of Political Science and The Graduate School for the M.P.A. degree. Applicants must also be accepted by the Dual Degree Committee. All applicants must submit a Law School Admission Test (LSAT) score. An applicant's LSAT score may be substituted for the Graduate Record Examination (GRE) score, which is normally required for admission to the M.P.A. program. Application may be made prior to or after matriculation in the either the J.D. or the M.P.A. program, but application to the dual program must be made prior to entry into the last 29 semester hours required for the J.D. degree and prior to entry into the last 15 hours required for the M.P.A. degree.

Curriculum

A dual degree candidate must satisfy the requirements for both the J.D. and the M.P.A. degrees, as well as the requirements for the dual program. The College of Law will award a maximum of 9 semester hours of credit toward the J.D. degree for successful completion of approved graduate law 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 cross-credit is awarded must be approved by the J.D.-M.P.A. coordinators in the College of Law and the Department of Political Science. All candidates for the dual degree must successfully complete Administrative Law (Law 821) and are encouraged to take Local Government (Law 824). An internship is strongly recommended for students in the dual degree program, as it is for all M.P.A. candidates, but an internship is not required.

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 fields. 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 course credit quality for credit without regard to the dual program.

Awarding of Grades

For grade reporting 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 the J.D. degree. The College of Law will award a grade of Satisfactory for an approved M.P.A. course in which the student earns a grade of B or higher and a grade of No Credit for any lower grade. The Political Science Department will award a grade of Satisfactory for an approved law course in which the student earns a grade of 2.0 or higher and a grade of No Credit for any lower grade. The official academic record of the student maintained by the Registrar of the University shall show the actual grade assigned by the instructor without conversion.

THE DOCTORAL PROGRAM

The Ph.D. program prepares students for careers in college teaching, as well as careers in other occupations related to service in the public or private sectors. Applicants for admission to the program should normally have completed a master's degree in political science or related field with a 3.5 GPA and have earned a composite score of at least 1100 on the verbal and quantitative parts of the Graduate Record Examination.

Doctoral students admitted to the program must complete 84 hours beyond the bachelor's degree, including 24 hours of coursework beyond the master's degree, graded A-F, must successfully pass written and oral comprehensive examinations in three 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 UTK in each of the three broad subfields in which the student takes examinations.
5. Completion of at least one course or seminar in each of six broad subfields available for graduate instruction in the department.
6. At least 8 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.

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.

442 Administrative Law (3) Legal dimensions of administrative power and procedures, and constitutional control over administrators.

452 Black African Politics (3) Recent evolution and current political environment of Black African nations. (Same as Afro-American Studies 452.)

454 Government and Politics of China and Japan (3) Examination of the political setting, structure and political processes in China and Japan.

459 Government and Politics of the Soviet Union (3) Origins and development of Soviet political system, and study of selected policy areas.

461 Policy Making in Democracies (3) Comparative approach to theory and process of making public policies.

463 Contemporary Middle East Politics (3) Governments and movements in Middle East, their characteristics, bases, and interrelationships.

470 International Law (3) Nature and development of international law and compliance. Function of international law in the context of international conflict.

475 Ancient and Medieval Political Thought (3) Survey of major western political thinkers from Socrates to Marsilius of Padua.

476 Modern Political Thought (3) Survey of major western political thinker from Machiaveli to Marx.

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

See Materials Science and Engineering

### Psychoeducational Studies

**MAJORS**

<table>
<thead>
<tr>
<th>Degree</th>
<th>College of Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAJORS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DEGREES**

<table>
<thead>
<tr>
<th>Degree</th>
<th>College of Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAJORS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Professors:**

Bellon, Jerry J. (Emeritus), Ed.D., UC Berkeley
Brockett, Ralph G., Ph.D. .................................. Berkeley
Cameron, Walter A., Ph.D. ................................. Ohio State
Dixon, Donald J., Ed.D. .................................... Oklahoma State
Duncan, Thomas W., Ed.D. ................................. Tennessee
Greenberg, Katherine H., Ph.D. ......................... George Peabody
Kasworm, Carol E., Ed.D ................................ Georgia
McCallum, R. S., Ph.D. ............................... George Peabody
Peters, John M., Ed.D. ................................ NC State
Williams, R. L. (Liaison), Ph.D. ....................... George Peabody

**Associate Professor:**

Kendall, Luther M., Ed.D. ................................. Tennessee

**Assistant Professor:**

Whitaker, Dianne, Ph.D. ................................ Washington
The Psychoeducational Studies unit participates in graduate programs leading to degrees, majors, and concentrations in:

- **Master of Science**
  - Educational Psychology
    - Adult education
    - Individual and collaborative learning
  - Educational Specialist
    - School psychology
  - Doctor of Education
    - Educational psychology: collaborative learning
    - Doctor of Philosophy
      - Adult education
      - School psychology

See Education under Fields of Instruction for full description of all degree requirements.

The mission of the Psychoeducational Studies unit is to provide national leadership in creating learning environments that foster psychological health, address authentic educational needs, and promote lifelong learning. The college seeks opportunities in a diversity of contexts for learners to apply data-based problem solving, engage in reflective and evaluative thinking, and implement the structures and processes necessary for effective collaboration.

### 166 Psychoeducational Studies

<table>
<thead>
<tr>
<th>Course Code and Title</th>
<th>Prerequisites</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>502 Registration for Use of Facilities</td>
<td>(3-15) Required for the student not otherwise registered during any semester when student uses University facilities</td>
<td>3-15</td>
</tr>
<tr>
<td>503 Problems in Lieu of Thesis</td>
<td>May be repeated, Maximum 9 hrs.</td>
<td>3-15</td>
</tr>
<tr>
<td>504 Special Topics</td>
<td>Instructor-initiated course offered at convenience of unit on topics of current interest</td>
<td>1-15</td>
</tr>
<tr>
<td>505 Psychological Theories of Human Development Applied to Education</td>
<td>Theory and research on emotional, social, and intellectual development over life span with applications to educational and therapeutic settings</td>
<td>3</td>
</tr>
<tr>
<td>510 Reflective Practice in Education and Psychology</td>
<td>Concepts, theories and processes of reflective practice applied to educational settings</td>
<td>3</td>
</tr>
<tr>
<td>511 Individual Study in Adult Education</td>
<td>Prereg.: Consent of instructor</td>
<td>3</td>
</tr>
<tr>
<td>512 Program Development and Operation in Adult Education</td>
<td>Theories and methods from research to practice in planning and operating adult education programs</td>
<td>3</td>
</tr>
<tr>
<td>513 Advanced Seminar in Adult Development</td>
<td>Coreq: Consent of instructor</td>
<td>3</td>
</tr>
<tr>
<td>514 Adult Development</td>
<td>Changes in characteristics of adults over life span and implications for education</td>
<td>3</td>
</tr>
<tr>
<td>515 Educational Applications of Behavioral Theories of Learning</td>
<td>Behavioral theories and research, conditioning, observational, and ethical/ethical settings as systems apply to student motivation, discipline and learning</td>
<td>3</td>
</tr>
<tr>
<td>516 Educational Applications of Cognitive Learning Theories</td>
<td>Cognitive theory and research, social learning, attribution and information processing as applied to education</td>
<td>3</td>
</tr>
<tr>
<td>518 Educational Specialist Research and Thesis</td>
<td>May be repeated, P/NP only</td>
<td>3-15</td>
</tr>
<tr>
<td>520 Survey of Adult Education</td>
<td>Historical development, philosophies of adult education agencies, associations, programs, issues, and literature illustrating process of adult education and diversity of continuing education</td>
<td>3</td>
</tr>
<tr>
<td>521 Program Development and Operation in Adult Education</td>
<td>Theories and methods from research to practice in planning and operating adult education programs</td>
<td>3</td>
</tr>
<tr>
<td>522 Adult Development</td>
<td>Changes in characteristics of adults over life span and implications for education</td>
<td>3</td>
</tr>
<tr>
<td>523 Post-Secondary Education for Adults</td>
<td>History, evolution, philosophy, structure and functions of post-secondary, sub-university institutions, their programs and clientele.</td>
<td>3</td>
</tr>
<tr>
<td>524 Continuing Professional Education</td>
<td>Theories and concepts supporting design and management of educational programs for adults in professions</td>
<td>3</td>
</tr>
<tr>
<td>525 Characteristics of Adult Learners</td>
<td>Key characteristics of adult learners, and applications to teaching and learning contexts</td>
<td>3</td>
</tr>
<tr>
<td>526 Informal Methods of Assessment and Development</td>
<td>Use of rating scales, check-lists, observation, test scores and case studies in assessment and counseling of children and adults.</td>
<td>3</td>
</tr>
<tr>
<td>527 Controversies in Adult Education</td>
<td>Controversies confronting field of adult education; development of critical analysis and reflecting on controversies from different perspectives</td>
<td>3</td>
</tr>
<tr>
<td>528 Psychology of Aging</td>
<td>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.</td>
<td>3</td>
</tr>
<tr>
<td>530 Methods of Collaborative Inquiry</td>
<td>Philosophical and theoretical frameworks for designing and conducting collaborative inquiry projects. Practice in conducting research</td>
<td>3</td>
</tr>
<tr>
<td>540 Seminar in School Psychology</td>
<td>Essentials of theory and practiced of school psychology as professional specialty. Consideration of history and current issues in school psychology.</td>
<td>3</td>
</tr>
<tr>
<td>541 Psychoeducational Assessment</td>
<td>Direct, psychometric and naturalistic assessment methods in learning environments. Prereg.: Admission to Ed.D. in educational psychology program or consent of instructor, and Counselor Education and Counseling Psychology P525 or equivalent.</td>
<td>3</td>
</tr>
<tr>
<td>542 Practicum in Psychoeducational Assessment</td>
<td>Application of assessment skills to clients in learning environments. Coreq: 541 or consent of instructor. May be repeated. Maximum 6 hrs.</td>
<td>3</td>
</tr>
<tr>
<td>545 Psychoeducational Consultation</td>
<td>Use of two and three-person models of consultation in educational and therapeutic settings based on behavioral, ecological, social learning and cognitive-behavioral theories.</td>
<td>3</td>
</tr>
<tr>
<td>546 Practicum in Consultation</td>
<td>Application of consultation skills to educational settings. Prereg.: 545.</td>
<td>3</td>
</tr>
<tr>
<td>549 Internship in School Psychology</td>
<td>Supervised employment in unit approved school psychology internship sites. Prereg: Enrollment in school psychology program and consent of instructor. May be repeated. Maximum 12 hrs.</td>
<td>3</td>
</tr>
<tr>
<td>550 Discipline and Conflict Resolution</td>
<td>Application of major models of discipline and conflict resolution strategies in development of constructive atmosphere for classroom learning.</td>
<td>3</td>
</tr>
<tr>
<td>572 Cognitive Education: Models and Approaches</td>
<td>Models and approaches in field of cognitive education: rationale, implementation and support for various program components, critical variables of organizational learning that affect success of implementation.</td>
<td>3</td>
</tr>
<tr>
<td>573 Meeting Needs of Nontraditional and Underachieving Learners</td>
<td>Exploration of students' needs at any age and level of functioning who are not progressing up to their fullest potential. Causes of academic and motivational problems, and approaches to overcome them. Learning to learn, cultural alienation, and personal world view and interaction with effective teaching and learning.</td>
<td>3</td>
</tr>
<tr>
<td>574 Facilitating Group Change</td>
<td>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.</td>
<td>3</td>
</tr>
<tr>
<td>575 Seminar in Gerontology</td>
<td>(Same as Human Ecology 575)</td>
<td>3</td>
</tr>
<tr>
<td>576 Seminar in Counseling Psychology</td>
<td>(Same as Human Ecology 576)</td>
<td>3</td>
</tr>
<tr>
<td>577 Independent Study</td>
<td>May be repeated, S/N only</td>
<td>3</td>
</tr>
<tr>
<td>600 Doctoral Research and Dissertation</td>
<td>(3-15) P/NP only</td>
<td>3</td>
</tr>
<tr>
<td>602 Directed Research</td>
<td>Instructor- or student-initiated research on empirical and theoretical problems in educational and counseling psychology. May be repeated. Maximum 12 hrs.</td>
<td>3</td>
</tr>
<tr>
<td>604 Special Topics</td>
<td>Instructor-initiated courses offered at convenience of unit on topics of interest. May be repeated. Maximum 15 hrs.</td>
<td>3</td>
</tr>
<tr>
<td>609 Advanced Seminar in Counseling Psychology</td>
<td>Team-taught interdisciplinary seminar on trends, theories, and issues in curriculum and learning. Reading and discussions based on significant research and scholarly publications.</td>
<td>3</td>
</tr>
<tr>
<td>620 Seminar in Adult Education</td>
<td>Issues in adult education, theories and concepts, philosophical positions, research trends and methodologies. Prereg.: 520 or equivalent.</td>
<td>3</td>
</tr>
<tr>
<td>621 Advanced Seminar in Program Planning</td>
<td>Concepts, principles, and research related to program planning in adult education. Prereg.: 521 or equivalent.</td>
<td>3</td>
</tr>
<tr>
<td>622 Advanced Seminar in Adult Development</td>
<td>Adult development research. Designing research for studies of life cycle. Prereg.: 522 or equivalent.</td>
<td>3</td>
</tr>
<tr>
<td>630 Doctoral Seminar in Collaborative Learning</td>
<td>Issues, theories, concepts and research in collaborative learning. Prereg.: Admission to Ed.D. in Education,</td>
<td>3</td>
</tr>
</tbody>
</table>
Psychology

(College of Arts and Sciences)

MAJOR DEGREES

Psychology .................. M.A., Ph.D.

James E. Lawler, Acting Head

Professors:
Burghardt, Gordon M., Ph.D. .......... Chicago
Burstein, Alvin G., Ph.D. .......... Chicago
Calhoun, William H., Ph.D. .......... California
Finke, Harold J. (Emeritus), Ph.D. .......... Syracuse
Handel, Stephen J., Ph.D. .......... Johns Hopkins

Handler, Leonard, Ph.D. .......... Michigan State
Jones, Warren H., Ph.D. .......... Oklahoma State
Lawler, James E., Ph.D. .......... North Carolina
Lawler, Kathleen A. (Liaison),
Ph.D. .......... North Carolina
Lounsbury, John W., Ph.D. .......... Michigan State
Lubar, Joel F., Ph.D. .......... Chicago
Malone, John C., Ph.D. .......... Duke
Newton, Kenneth R. (Emeritus),
Ph.D. .......... Tennessee
Pollio, Howard R. (Distinguished Prof.),
Ph.D. .......... Michigan
Samejima, Fumiko, Ph.D. .......... Keio
Saudargas, Richard S., Ph.D. .......... Florida State
Shadrer, Raymond R. (Emeritus),
Ph.D. .......... Tennessee
Sundstrom, Eric D., Ph.D. .......... Utah
Travis, Cheryl B., Ph.D. .......... California (Davis)
Verplanck, William S. (Emeritus), Ph.D. .......... Brown
Wahler, Robert G. (Liaison), Ph.D. .......... Washington
Wibberley, J. Albert (Emeritus), Ph.D. .......... Syracuse

Associate Professors:
Baldwin, Deborah R., Ph.D. .......... Kent State
Hopson, Ronald E., Ph.D. .......... Michigan State
Johnson, Michael G., Ph.D. .......... Johns Hopkins
McIntyre, Anne, Ph.D. .......... Yale
Morgan, Wesley G., Ph.D. .......... Tennessee
Nash, Michael R., Ph.D. .......... Ohio

Assistant Professor:
Welsh, Deborah, Ph.D. .......... Massachusetts

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 30 semester hours of graduate level courses in psychology. These hours must include 504-05, or Statistics 531-32 or an equivalent sequence; 565 or 420; six semester hours of Thesis 500; and twelve hours of 500- or 600-level foundation courses. Students must earn a grade of B or better in all courses that are to count toward the 30-hour total. Students must also propose, conduct and successfully defend an original piece of research in the form of a master's thesis.

THE DOCTORAL PROGRAM

A student with a B.A. or B.S. may apply to the Department of Psychology for admission to the doctoral program with a concentration in experimental psychology or clinical psychology. The doctoral program with a concentration in ethnology is offered through the Life Sciences program. Doctoral study in industrial and organizational psychology is offered through the Intercollege program in Industrial and Organizational Psychology, to which application is made through the Department of Management.

Experimental Psychology

The Ph.D. program in Psychology with a concentration in experimental psychology is designed to allow students to select from a variety of specializations oriented toward careers in research, teaching, and application of psychology in academic, institutional, or industrial settings. The program is flexible, individualized, and emphasizes a professional apprenticeship model of training. A full description of the program is given in the "Handbook for Students in Experimental Psychology," available from the department.

The basic requirements are:
1. Two semester hours of statistics and research (504-05 or Statistics 531-32 or equivalent and 6 additional hours in research methods or design).
2. Fifteen semester hours in experimental psychology (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 practical (509).
4. Psychology 528 - preparation for college teaching.
5. Two 600-level graduate level courses outside the Psychology Department.
6. 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.
7. 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.
8. Twenty-four hours of dissertation research (609).
9. An original piece of research in the form of a doctoral dissertation, proposed, conducted and defended.

Clinical Psychology

This program is designed to lay the groundwork for a career as a clinical psychologist capable of working in both academic and applied settings. The program emphasizes the theoretical foundations of psychology as well as supervised experience oriented toward the development of practical skills. The program embodies a model of clinical psychology in which practice and research are integrated.

Clinical program students must complete a predissertation research project by the end of the second year. After forming the doctoral committee, students must then pass a comprehensive examination administered and evaluated by the committee. This examination is comprised of two papers, one addressing a topic of the
student's choice, and the second addressing an understanding of one individual's personality and cognitive functions. All doctoral students must complete a minimum of 78 hours of graduate level courses, including courses required by their program; at least 6 hours in courses outside of psychology; and at least 24 hours of dissertation research (Psychology 600). Finally, students must complete an acceptable doctoral dissertation and conduct a satisfactory oral defense of the dissertation. Requirements are as follows:

1. Apprenticeship with one faculty member during the first year, two days each week.
2. Pre-dissertation research project completed before forming a doctoral supervisory committee, reported in written form acceptable to two members of the faculty or, if reviewed and accepted for publication or external presentation, by one member of the faculty.
3. Supervised clinical placement two days (16 hours) each week during the second year, and the following option during the third and fourth years:
   a. continued two day clinical placement in the third and fourth years.
   b. teaching assistantship in the department in either the third or fourth year and two day clinical placement in the other year.
4. Satisfactory completion of listed courses (or equivalents) in the following sixteen categories:
   a. Foundations of Psychology: Biological Factors, Perception, Learning, Thinking, Motivation (513);
   b. Interviewing and Observation (558) and Laboratory (559);
   c. Research Practicum (509) (4 hrs.);
   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 (694-95) and Laboratory (586);
   i. Empirical Methods in Psychology (504) and Research Design (505);
   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);
   n. Ethical, Legal and Professional Issues in Psychology (685);
   o. Psychodynamic Psychotherapy I and II (670-71) and Laboratory (673) (4 hrs.);
   p. Doctoral Research and Dissertation (600) (24 hrs.).
5. Satisfactory completion of a one-year clinical internship at a site approved by the program.
6. Students who choose a teaching assistantship in the third or fourth year must have satisfactorily completed 528 College Teaching in Psychology.
7. Satisfactory completion of at least 3 additional graduate-level courses in non-clinical topics in psychology.
8. Satisfactory completion of a one-year clinical internship at a site approved by the program.

GRADUATE COURSES

400 Cognitive Psychology: Language and Symbolic Processes (3) Psychology of knowing, explaining, and understanding. Directed and associative thinking, memory, problem-solving, concept-formation, nature, use, and development of language. Prereq: 310 or consent of instructor.

409 Group Facilitation (3) Study of theory and technique through supervised experience in small groups. Prereq: 310 and consent of instructor. May be repeated. Maximum 6 hrs.


415 Psychology of Religion (3) History of psychology of religion: various philosophical and empirical orientations. Psychological function of religion for individuals and society. Prereq: Junior or senior standing.


424 Psychology and the Law (3) Psychological aspects of legal systems. Prereq: 110 or equivalent, upper-division standing and 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: 110 or equivalent, 210, 293 (Same as Women's Studies 434.)

440 Organizational Psychology (3) Social-psychological analysis of organizations, role-theory and systems theory. Prereq: 390.


450 Comparative Animal Behavior (3) (Same as Ecology and Evolutionary Biology 450.)

458 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: 110 or equivalent, 210, and 1 yr of biology or zoology introductory sequences or equivalents.

469 Laboratory in Physiological Psychology (3) Laboratory studies of nervous system and physiological correlates of behavior. Coreq: 461.

470 Theories of Personality (3) Survey of major theories of human personality and their development. Prereq: 220 and 300 or 330.


480 Theories of Learning (3) Classical and current approaches to learning and cognition. Prereq: 310.

482 Topics in Psychology (3) Intensive analysis of special topics: Afro-American psychology or evaluation of programs in community. Prereq: Biological Basis of Behavior or Behavior and Experience: Humanistic Psychology and at least 9 hrs in 300-level courses. Recommended prereq: Statistics in Psychology. Methods of Research in Psychology. May be repeated. Maximum 6 hrs.

489 Supervised Research (1-9) Prereq: Consent of Instructor. May be repeated. Maximum 12 hrs in 399, 499, 491, 492, and 493 combined may apply toward undergraduate major.

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

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


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: 525 and consent of instructor.

508 Readings and Special Issues in Psychology (1-3) Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. E

509 Research Practicum (1-3) Required of first-year graduate students in psychology. May be repeated. Maximum 9 hrs. S/N only. E

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. F

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/N only. F,Sp

516 Colloquium in Ecolomy (1) Current research and theory. May be repeated. Maximum 9 hrs. (Same as Ecology and Evolutionary Biology 516). S/N only. E

526 General Vertebrate Neuroanatomy (3) Lecture and laboratory. Structure and functioning of central and peripheral nervous system. Prereq: 461, 469, 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/N only.


545 Advanced Animal Behavior (3) (Same as Ecology and Evolutionary Biology 545.)

546 Ethological Psychology (3) Basic ethology and comparative approaches to learning and behavior. Prereq: Consent of instructor.

547 Conceptual Foundations of Evolution and Behavior (3) Critical evaluation of seminal writings on theory and research concerning ethology and evolutionary 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. F

554 Laboratory in Psychometrics (3) Further learning about psychometrics: item response theory (modern mental test theory), factor analysis, and applications of those methods using computer programs to
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>555</td>
<td>Psychometrics (3)</td>
<td>Basic concepts: factor analysis, scaling, test theories, probability models and their applications, computerized adaptive testing and other topics. Prereq: Statistics 202 or 358 or equivalent. May be repeated. Maximum 6 hrs.</td>
</tr>
<tr>
<td>557</td>
<td>Applied Psychological Measurement (3)</td>
<td>Issues and techniques in applying psychological measurement in organizational, clinical, and community research. Prereq: Statistics 202 or 358 or equivalent or consent of instructor. May be repeated. Maximum 6 hrs.</td>
</tr>
<tr>
<td>558</td>
<td>Interviewing and Observation (3)</td>
<td>Sensitizing students to own feelings and beliefs and to feelings of interviewee, and analysis of language content, style, and body language. Explains of important aspects of interviewer's role. Prereq: Admission to doctoral program in clinical psychology or consent of instructor. Coreq: 559.</td>
</tr>
<tr>
<td>559</td>
<td>Laboratory in Interviewing and Observation (1)</td>
<td>Prereq: Admission to doctoral program in clinical psychology or consent of instructor. Coreq: 558.</td>
</tr>
<tr>
<td>560</td>
<td>Psychology of Learning (3)</td>
<td>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.</td>
</tr>
<tr>
<td>565</td>
<td>History and Systems of Psychology (3)</td>
<td>History and philosophy concerning psychology. Major systems of psychology which emerged during 20th century. Prereq: Graduate standing. Sp.</td>
</tr>
<tr>
<td>570</td>
<td>Personality: Theory and Research I (3)</td>
<td>Advanced survey of psychoanalytic and non-psychoanalytic approaches to personality; related research. Prereq: Admission to clinical program or consent of instructor. F.</td>
</tr>
<tr>
<td>571</td>
<td>Personality: Theory and Research II (3)</td>
<td>Advanced survey of behavioral and humanistic approaches to personality; related research. Prereq: Admission to clinical program or consent of instructor. Sp.</td>
</tr>
<tr>
<td>573</td>
<td>Descriptive and Theoretical Psychopathology (3)</td>
<td>Current psychiatric taxonomic systems. Theories of etiology for various diagnostic categories. Examples from written case vignettes and recorded interviews. Prereq: Admission to doctoral program in clinical psychology or consent of instructor. F.</td>
</tr>
<tr>
<td>575</td>
<td>Psychopharmacology (3)</td>
<td>Connections between pharmacology and psychology. Prereq: Consent of instructor.</td>
</tr>
<tr>
<td>576</td>
<td>Object Relations (3)</td>
<td>European and American concepts of normal and psychopathological development of object relations. Significance for psychotherapy, psychoanalysis, and psychodynamic theory. Prereq: Admission to doctoral program in clinical psychology or consent of instructor.</td>
</tr>
<tr>
<td>578</td>
<td>Clinical Aspects of Human Sexuality (3)</td>
<td>Variation in human sexual behavior. Theories of etiology, treatment. Prereq: Consent of instructor.</td>
</tr>
<tr>
<td>580</td>
<td>Research Questions and Design (3)</td>
<td>Question-asking process in research and strategies or designs through which answers might be derived. Prereq: Administration to doctoral program in clinical psychology or consent of instructor.</td>
</tr>
<tr>
<td>593</td>
<td>Independent, Off-campus, or Foreign Study (1-15)</td>
<td>Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. S/N-C only.</td>
</tr>
<tr>
<td>594</td>
<td>Psychological Assessment I (3)</td>
<td>Basic concepts and techniques of adult assessment: intelligence tests and personality tests. Prereq: Admission to doctoral program in clinical psychology or consent of instructor. Sp.</td>
</tr>
<tr>
<td>595</td>
<td>Psychological Assessment II (3)</td>
<td>Basic concepts and techniques of adult assessment: intelligence tests and personality tests. Prereq: Admission to doctoral program in clinical psychology and 594 or consent of instructor. F.</td>
</tr>
<tr>
<td>596</td>
<td>Laboratory in Psychological Assessment (1)</td>
<td>Prereq: Admission to doctoral program in clinical psychology or consent of instructor. Coreq: 594 or 595. May be repeated. Maximum 4 hrs. S/N-C only. Sp.</td>
</tr>
<tr>
<td>600</td>
<td>Doctoral Research and Dissertation (3-16)</td>
<td>Prereq: Admission to doctoral program in clinical psychology. May be repeated. Maximum 16 hrs.</td>
</tr>
</tbody>
</table>

### Rehabilitation, Deafness, and Human Services

(College of Education)

<table>
<thead>
<tr>
<th>MAJORS</th>
<th>DEGREES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counseling</td>
<td>M.S. Education</td>
</tr>
<tr>
<td>Robert F. Kronick, Leader</td>
<td>M.S., Ph.D.</td>
</tr>
</tbody>
</table>

### Associate Professors:
- Cassell, Jack L., Ph.D. Kansas
- Colby, Ian, Ed.D. Virginia
- Mulkey, S., William, Ph.D. Florida State
- Warden, K., Ph.D. Tennessee

### Assistant Professors:
- Barnes, Rhoda, Ph.D. California
- McLean, James D., Ph.D. Chicago

---

### The Rehabilitation, Deafness and Human Services Education unit participates in graduate programs leading to degrees, majors, and concentrations in:

- Master of Science
- Counseling

### Education

- Rehabilitation counseling
- Track 1: Education of the deaf and hard of hearing
- Track 2: Education of the deaf and hard of hearing
- Doctor of Philosophy

### Education

- Rehabilitation/special education

See Education under Fields of Instruction for full description of all degree requirements. The vision of the Rehabilitation, Deafness, and Human Services unit is one of full inclusion for persons with disabilities in a multicultural nation. Faculty and staff pursue, as a common mission, improvement in the quality of life for persons with disabilities and focus research interests on the development of new knowledge and technology to meet the unique educational, social, and employment needs of this population. A major goal of the unit is the preparation of graduates for future leadership and professional roles in business and industry, education, and community and government service.

The Rehabilitation, Deafness, and Human Services unit includes several educational programs sponsored by the U.S. Department of Education, Office of Special Education and Rehabilitation Services, Rehabilitation Services Administration, including: Regional Rehabilitation Continuing Education Program, Orientation to Deafness, Southeastern Regional Interpreters Training Consortium, National Interpreter Training Center, and the Educational Interpreting program.

### GRADUATE COURSES

415 Language Development of Hearing Impaired (3) Language problems of hearing impaired contrasted with scope and sequence of normal language development. Formal linguistic systems used to describe language development problems.


419 Speech Development of Hearing Impaired (4) Theories of speech development, approaches in training perception and production of speech, and auditory habilitation. Practice experiences.

424 Nature of Hearing Impairments (3) Basic principles of audiology: anatomy and physiology of hearing; nature and causes of hearing loss; speech therapy and rehabilitation; evaluation of audiological services to medical and other rehabilitative disciplines.

425 Introduction to the Psychology and Education of the Hearing Impaired (3) Primarily for those planning to teach hearing impaired. Overview of research related to psychology, social adjustment, communication meth-
practice in Communication Disorders in Schools (S) Provides practice in counseling and communication disorders. Prereq: 433, 434 (80-100 clinical contact hrs). 482

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

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


504 Clinical Experience in Teaching an Supervision of Exceptional Children (3-9) (Same as Inclusive Early Childhood 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.

518 Educational Specialist Research and Thesis (3) May be repeated. P/NP only. E

523 Practicum in Hearing Impairment (3) Receptive and expressive language capabilities of hearing impaired student. Designing, teaching, and post-testing of instruction for remediation of specific language errors.

528 Curriculum Developed to Programs for the Hearing Impaired (3) Current curriculum trends adapted for hearing impaired persons to provide guidance in career decisions and individualized rehabilitation plan. Qualifications of service providers. Assessment, plan development, and provision of services to people who have disabilities and vocational handicaps. Identification, mobilization, and utilization of rehabilitation resources.

529 Teaching Reading to the Hearing Impaired (3) Specific method necessary to teach the prelingually hearing impaired student. Practice in preparation of developmentally appropriate reading materials. Methods which assist in integration of hearing impaired students in regular reading curricula and materials. Prereq: 415.

530 Orientation to Rehabilitation (3) History, philosophy, legal and economic bases, current issues, and practices in public and private rehabilitation programs. Qualifications of service providers. Assessment, plan development, and provision of services to people who have disabilities and vocational handicaps. Identification, mobilization, and utilization of rehabilitation resources.

532 Caseload Management in Rehabilitation (3) Techniques and procedures involved in management of caseloads in Federal-State vocational rehabilitation agencies. Private rehabilitation companies, and public or private rehabilitation facilities. Analysis of appropriate industrial management models related to rehabilitation programs.

533 Job Analysis, Development, and Placement (3) Determining employment needs of people with disabilities, identifying appropriate job for selected clients, and assisting clients in seeking, obtaining, and retaining employment. Job analysis, job modification and re-engineering, employer facilities, Analysis of appropriate industrial management models related to rehabilitation programs.

535 Vocational Evaluation: Statistical Methods (3) Process principles and techniques used to determine vocational assets and liabilities of people with disabilities. Functional analysis of biographical and interview data; selection and application of relevant psychometric instruments; integration of statistical data into diagnostic reports; application of computer-generated reporting systems.

537 Vocational Evaluation: Clinical Methods (3) Process, principles, and techniques used to assist individuals in determining and understanding their own work behavior and vocational potential. Selection and use of occupational exploration programs and work samples; application of situational tasks, job-tours, and simulated work experiences in vocational evaluation. Clinical interpretation of data through formal staff conference, vocational counseling, and report writing.

538 Disability Management (3) Return-to-work issues in disability management programs: early intervention, quality services, and cost containment; standards and procedures for rehabilitation counselors/case managers in private sector rehabilitation.

541 Psychosocial Aspects of Exceptionalities (3) Psychosocial impact of exceptionalities 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 disability 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 experiences in area of rehabilitation: application of concepts, principles, and skills. Prereq: Consent of instructor.

549 Internship in Rehabilitation Counseling (12) Supervised practicum in rehabilitation counseling. Full time clinical experience for second-year student (600 clock hrs. required).

579 Special Topics (1-3) Prereq: Admission to graduate program. May be repeated. Maximum 8 hrs. S/NC or letter grade.

591 Clinical Studies (4) Relationship between educational theory and application during internship; research project, development of portfolio, and capstone experience.

592 Assistive Technology in Special Education and Vocational Rehabilitation (3) Technology as applied to needs of school age and post-secondary age students. Delivery of assistive technology services; software programs for assistive devices; delivery systems, interdisciplinary evaluation/planning, and funding issues.

593 Independent Study (1-3) May be repeated. S/NC or letter grade. E


601 Seminar in Educational Theories in Special Education and Rehabilitation (3) Education theories; education and rehabilitation of exceptional persons. Theory applications in educational settings. Prereq: Admission to doctoral program or consent of instructor.

602 Seminar in Social Processes in Special Education and Rehabilitation (3) Social phenomena which influence impact of disability on person and on significant others. Implications for habilitation. Prereq: Admission to doctoral program or consent of instructor.

603 Seminar in Research in Special Education and Rehabilitation (3) Development and implementation of research. Independent research studies. Research proposals. Prereq: 9 hrs of research core and consent of instructor.

610 Internship in College Teaching and Supervision (3-9) Supervised practice in college teaching and supervision. Prereq: Admission to doctoral program or consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

620 Internship in Research in Special Education and Rehabilitation (3-9) Placement with professional engaged in theoretically-based research; public school, institutions, agencies. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

630 Internship in Institutional Leadership in Special Education and Rehabilitation (3-9) Advanced level field experiences under supervision of practitioner. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

679 Special Topics (1-3) Prereq: Admission to doctoral program. May be repeated. Maximum 9 hrs. S/NC or letter grade.

693 Independent Study (1-3) May be repeated. S/NC or letter grade. E

Religious Studies

(Students of Arts and Sciences)

Charles H. Reynolds, Head

Professors:

Dungan, David L., Th.D. .......... Harvard
Hackett, Rosalind L., Ph.D. ...... Aberdeen
Humphreys, W. Lee, Ph.D. ...... Union
Linge, David E., Ph.D. .......... Lubys, F. Stanley (Emeritus), M.D.
Norman, Ralph V., Jr., Ph.D. ... Yale
Reynolds, Charles H., Ph.D. ... Harvard

Associate Professors:

Fitzgerald, James L., Ph.D. ......... Chicago
Gwylene, Roselind W., Ph.D. ...... Washington
Hodges, John O., Ph.D. .......... Levering, Miriam L., Ph.D. ......... Harvard
Schmidt, Glyta G., Ph.D. ......... Pittsburgh

Assistant Professor:

Hulseth, Mark, Ph.D. .......... Minnesota

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.

GRADUATECOURSES

405 Modern Jewish Thought (3) History, culture, and geography of the now Israel 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 406.)

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 Mohaka Tradition (3) Investigation of selected writings and philosophical problems of traditions of Srmanitva, Yoga, Vedanta, Buddhism, or Jainism. Prereq: 374 or 376 or consent of instructor. (Same as Philosophy 412.)

416 Jesus and Paul Compared (3) Central ideas and concepts of each person compared with equivalents in the other. Advanced study of Gospels and Epistles of Paul, including extensive independent research.

425 Seminar in Western Religions (3) Selected figures, themes, movements, and problems. Content varies. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

430 Seminar in American Religion (3) Selected figures, themes, movements, and problems. Content varies. Prereq: Consent of instructor. May be repeated. Maximum 8 hrs.

440 Seminar in Comparative Religion (3) Selected figures, themes, movements, and problems. Content varies. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.
Assistant Professors:
Beauvois, Margaret, Ph.D. .......... Texas
Essif, Les, Ph.D. ..................... Brown
Kaplan, Gregory, Ph.D. .......... Columbia
McAlpin, Mary K., Ph.D. ........ Sorbonne
Nakuma, Constancio, Ph.D. .... Sorbonne
Silvafillo, Eurdice, Ph.D. ...... North Carolina

The Department of Romance Languages offers two advanced degrees: the Master of Arts in French and in Spanish and the Doctor of Philosophy in Modern Foreign Languages.

Inquiries should be addressed to the head of the department. The head, through the coordinators of Spanish and French, will make available further departmental requirements, regulations, and materials not listed below.

THE MASTER'S PROGRAM

Thesis Option
1. Completion of a minimum of 24 semester hours in coursework plus at least 6 hours in course 500 Thesis. In French, 501 is required; in Spanish, 550. 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 501 (French) or 550 (Spanish). 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. Three term papers that have been accepted by the student's advisory committee.
3. A written examination covering the coursework and selected items from a master reading list.
4. A final oral examination to discuss the papers (French M.A. only).

THE DOCTORAL PROGRAM

The Ph.D. in Modern Foreign Languages is offered jointly by the Department of Germanic, Slavic and Asian Languages and the Department of Romance Languages and requires advanced training in a major language and either a second language or applied linguistics. Students whose language of first concentration is German should consult the section on Germanic, Slavic and Asian Languages.

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 with German as a first concentration 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. Two tracks are available:

1. The coursework for Track I must be distributed in this way: 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.

2. The coursework for Track II must be distributed in this way: at least 45 hours in the first concentration; at least 12 hours in the second concentration; and at least 6 hours in a cognate field.

Because Track II students will have taken 12 graduate hours instead of 18 hours in the second concentration, they will normally not be eligible to teach that field at institutions which follow SACS guidelines for college foreign language teaching.

M.A. Requirement: French or Spanish. A minimum of 30 hours (Track I) or 45 hours (Track II) of French or Spanish courses beyond the bachelor's degree, distributed as follows: 400 level: a maximum of 6 hours of 400-level classes taken for the M.A. may be applied.
500 level: A minimum of 21 (Track I) or 27 (Track II) hours must be taken. These must include French 512, 516, 518 or Spanish 512 and 550. Thesis hours are excluded. If 512 is used as part of a second concentration in applied linguistics, another course must be substituted in the first concentration.
600 level: A minimum of 12 must be taken, exclusive of dissertation hours.

1. Second Concentration. A minimum of 18 (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, 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.

2. French students choosing applied linguistics must take French 421 or 429, 425; 512 and 9 (Track I) or 428, 425; 512 and 9 (Track II) hours of appropriate electives in English or French. Spanish students must take Spanish 421 or 428; 425; 512 and 9 (Track I) or 428, 425; 512 and 9 (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 of the first concentration but related to the student's principal area of research. Students choosing applied linguistics as a second concentration are strongly urged to take their cognate work in a second language.

4. Additional requirements: For any language 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...
French

GRADUATE COURSES


411 French Literature of the 16th Century (3) Highlights of 16th-century French literature. Excerpts from Rabelais and Montaigne; readings of poems from writers of the time. Prereq: 300-level literature course.

412 French Literature of the 17th Century (3) Major works of Enlightenment. Prereq: 300-level literature course.

413 French Literature of the 18th Century (3) Major works of the period. Prereq: 300-level literature course.


416 Survey of Francophone Literature (3) Examination of French literature outside metropolitan France, particularly Africa and Caribbean. Prereq: 300-level literature course.

420 French Cinema (3) French cinema from earliest days through New Wave directors. Prereq: 300-level literature course. May apply toward major.

421 Phonetics (3) Foundation in science of phonetics. Practical exercises and individual performance. Laboratory training highly recommended. Graduate credit not allowed for departmental majors. Prereq: Intermediate Compositional and Conversation or equivalent.

422 Advanced Grammar (3) Improving one's written French by studying basic and more refined structures of French language. Writing creative free-style compositions. Prereq: Intermediate Composition and Conversation or French for Business.

423-24 Advanced Conversation (1,1) Informal conversation with native speaker on contemporary topics. Stress in-class contact rather than outside preparation. Prereq: Intermediate Composition and Conversation or French for Business. 2 hr weekly.

425 Introduction to Descriptive Linguistics (3) Theory and practice of techniques of linguistic analysis in the fields of phonetics, phonology, morphology, syntax, semantics, pragmatics and historical linguistics. Discussion of relevance of learning and teaching of foreign languages and to study of literary texts. Recommended prerequisite: French for Business, Linguistics and Society. (Same as German 425, Linguistics 425, Russian 425, and Spanish 425.)

426 Methods of Historical Linguistics (3) (Same as German 426, Russian 426, Spanish 426 and Linguistics 426.)

420 Romance Linguistics (3) Development of Classical Latin through Vulgar Latin into major Romance languages. (Same as Spanish 429 and Linguistics 429.)


431 Highlights of French Civilization (3) Survey of French civilization from the Gauls to World War II. Historical events, daily life, all forms of arts. Prereq: 300-level literature course.

432 Contemporary French Culture (3) French contemporary civilization and culture since World War II. Problems, trends, and organization of French society today. Prereq: 300-level literature course.

434 Literature of Quebec (3) Survey of literature of Quebec as well as French literature connected with North America. Readings include expatriate and missionary works, such as Voyages of Champlain and Journals of Javal, and literature of contemporary Quebec. Prereq: 300-level literature course.

445 Advanced French for Business (3) Advanced contemporary French language and culture as relates to business transactions. Comparative approach to explore differences and similarities between francophone business culture and that of North America. Building knowledge of business terminology while being sensitized to cultural aspects and dangers of simplistic stereotyping. Prereq: French for Business or consent of instructor.

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

501 Techniques in Literary Analysis (3) Required for M.A. program. Intensive course in explication de texte, a style of literary analysis. Prereq: 300-level literature course.

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 requirements may be completed. May not be used toward degree requirements. May be repeated. S/N/C only. E

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.

516 Bibliography and Methods of Research (2) Critical research tools and scholarly norms in French literature and language. Practical exercises on compiling of scholarly data using computer-based and non-computer sources.


531 French Literature of the 16th Century I (3) Literature of first half of 16th century, Rabelais and other prose writers, humanists, and poetry of Marot, Lyonnais, and young Pléiade poets.

532 French Literature of the 16th Century II (3) Literature of second half of 16th century, mature works of Pléiade writers and such poets as d'Albigny and Sponde; Montaigne, writers of scientific works and moralists; drama.

541 French Literature of the 17th Century I (3) French prose and poems works of 17th century.

542 French Literature of the 17th Century II (3) Classical French theatre of 17th century.

551 French Literature of the 18th Century I (3) Reading and interpreting works of Mme. de Maintenon, Voltaire, Diderot, Rousseau, Beaumarchais, and others.

561 Lyric Poetry of the 19th Century (3) Reading and interpreting great French romantic poets, "Tart pour l'art" movement, Parnassians, Charles Baudelaire and Symbolists.

561-62 French Literature of the 19th Century (3) Reading and interpreting works of Hugo, Vigny, Stendhal, Balzac, Baudelaire, Flaubert, Zola, Verlaine, and others.

568-Reading and interpreting works of pro-Frenchian and post-Romantic periods.

571-72 Trends in Modern French Literature (3,3) In-depth study of some of most revolutionary, challenging poets, novelists, dramatists of 20th century.

571-82 The French Novel (3,3) French novel from 17th through 20th centuries.

583 Problems in Stylistics (3) Survey of comparative English-French stylistics, development and improvement of one's own French.

584 Modern Theory and Criticism (3) Survey of a century of critical theory, including psychoanalysis, Marxism, and structuralism.

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) P/NP only. E

602-23 Seminar in French Literature (3,3) Seminar in French literature for Graduate students. Students must be admitted as graduate students to participate. May be repeated with consent of department. Maximum 6 hrs each.

632-33 Seminar in French Literature (3,3) Second half of 19th Century; 633-20th Century. May be repeated with consent of department. Maximum 6 hrs each.

Italian

GRADUATE COURSES

401 Dante and Medieval Culture (3) Introduction to significance of this great Italian writer. Prereq: 212 or consent of instructor.
402 Petrarach and Boccaccio (3) Prereq: 212 or consent of instructor.

403 Literature of the Rinascimento (3) From Pulci to Tasso; Quattrocento and Cinquecento. Prereq: 212 or consent of instructor.

405 Modern Italian Poetry (3) From Pascoli to Montale. Prereq: Italian 212 or consent of instructor.

406 The Modern Italian Novel (3) From Manzoni to Calvino. Prereq: 212 or consent of instructor.

409 Directed Readings (3)

410 Italian Theatre (3) Survey of Italian theatre from Renaissance to present. Prereq: Intermediate Italian or consent of instructor.

421 Topics in Italian Literature and Cinema (3) Italian literature and cinema from 19th to present focusing on literary works translated into English and adapted into film. Investigation of relationship between literature and cinema and achievement of greater understanding of Italian Cultural since 1930. Films in Italian with English subtitles. May be repeated. Maximum 6 hrs. (Same as Cinema Studies 421.)

420 Readings in Italian Literature (Topics vary. May be repeated with consent of department.

510 Readings in Italian Literature (Topics vary. May be repeated with consent of department.

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

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

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

Portuguese

GRADUATE COURSES

400 Portuguese for Speakers of Another Romance Language (3) Accelerated class for beginning students of Portuguese with strong background in another Romance language. Introductions to grammar, reading and culture of Portugal and Brazil. Prereq: 3 hours at 200-level in another Romance language or equivalent.

431-32 Topics in the Literature & Language of Portuguese-speaking World (3, 3) Outstanding works of literature and culture from Portuguese countries. Topics 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.

Spanish

GRADUATE COURSES

421 Phonetics (3) Prereq: Intermediate Conversation and Composition or consent of instructor.

422 Advanced Grammar (3) Finer points of grammatical structures. Required for all majors. Available to non-native speakers only. Prereq: Intermediate Composition and Grammar and 9 hrs of upper division Spanish.

423 Advanced Conversation (3) Develops speaking skills to advanced level through wide range of activities. Available to non-native speakers only. Prereq: 422 or consent of instructor.

424 Advanced Composition (3) Develops writing skills to advanced level through numerous compositions on assigned topics. Available to non-native speakers only. Prereq: 422 or consent of instructor.

425 Introduction to Descriptive Linguistics (3) Same as French 425, German 425, Russian 425, and Linguistics 425.

426 Methods of Historical Linguistics (3) Same as German 426, French 426, Russian 426, and Linguistics 426.

429 Romance Linguistics (3) Same as French 429 and Linguistics 429.

430 History of Spanish Language (3) Evolution of Spanish language from its origins to present; major differences between Hispanic-American and Iberian Spanish. Prereq: Intermediate Composition and Grammar.

431 Spanish Civilization (3) Major social, political, and cultural achievements and how Spanish people from origins of their civilization until today. Prereq: Aspects of Spanish and Spanish American Literature or equivalent.

435-36 Survey of Spanish Literature (3.3) 435--Spanish literature through Golden Age. 436--Spanish literature since 1700. Prereq: Aspects of Spanish and Spanish American Literature or equivalent.

450 Hispanic Drama (3) Close reading and analysis of representative works by selected dramatists of each period, either Spanish or Spanish American. Topics vary. Prereq: Aspects of Spanish and Spanish American Literature or equivalent. May be repeated with consent of department. Maximum 6 hrs.

451 Hispanic Prose (3) Close reading and analysis of representative works by selected novelists, essayists or short story writers of Spain or Spanish America. Topics vary. Prereq: Aspects of Spanish and Spanish American Literature or equivalent. May be repeated with consent of department. Maximum 6 hrs.

452 Hispanic Poetry (3) Major poets of each period, either Spanish or Spanish-American. Topics vary. Prereq: Aspects of Spanish and Spanish American Literature or equivalent. May be repeated with consent of department. Maximum 6 hrs.

461 Special Topics (3) Aspect of Hispanic literature, culture, linguistics, or Spanish language pedagogy. Topics vary. May be repeated with consent of department. Maximum 6 hrs.

471 Latin American Civilization (3) Latin America's diverse heritage and major social and political institutions. Prereq: Aspects of Spanish and Spanish American Literature or equivalent.

473-74 Survey of Spanish American Literature (3, 3) 473--Historical survey from Conquest to late 19th century. 474--Major literary movements, writers and works of 20th century. Prereq: Aspects of Spanish and Spanish American Literature or equivalent.

479 Social Protest Literature of Latin American (3) Analysis of literature as means of unmasking social ills that have traditionally beset Latin America. Prereq: Aspects of Spanish and Spanish American Literature or equivalent.

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

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

521 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 Assistantship. Exempt those whose previous training or experience warrant their being excused by department.

522 Advanced Communication Skills for Teachers and Other Professionals (3) Advancement of oral and written proficiency in Spanish through extensive use of authentic contemporary materials; class lectures and discussions; oral and written examinations and reports. Especially recommended for graduate students, teachers and other professionals seeking to maintain or enhance high level communicative competency.

531 Old Spanish (3) Evolution of Spanish language from its origins through 15th century.

532 Medieval Spanish Literature (3) Spanish literature through 15th century.

533 Golden Age Prose (3) Wide range of prose fiction in Spain during 16th and 17th centuries: Molleres, picaroles, sentimental, pastoral and exemplary novels, and dialogues.

534 Don Quixote (3)

535 Golden Age Poetry (3) Garcia de Palacios, Fray Luis de Leon, San Juan de la Cruz, Lope de Vega, Quevedo, and Gongora.

537 Golden Age Drama (3) Major dramatical period: Lope de Vega, Tirso de Molina, Ruiz de Alarcón, Guillén de Castro, Calderón de La Barca, Moreto, and Rojas Zorrilla.

540 Eighteenth- and Nineteenth-Century Spanish Literature (3) Major works from 18th- and 19th-century Spain. Content varies with regard to theme, genre or literary movement.

542 Nineteenth-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 bibliographic and research materials.

551 Special Topics in Spanish or Spanish American Literature (3) May be repeated. Maximum 6 hrs.

552 Directed Readings (3)

561 Spanish American Colonial Literature (3) From pre-Columbian era through 18th century. Reading and analysis of selected works from Colonial Spanish American period and their Continental sources. Indigenous texts and authors.

562 Nineteenth-Century Spanish American Literature (3) From early nineteenth century to 1880. Content varies with regard to genre, theme, literary movements, or other aspects contributing toward definition of Spanish American literature.


573 The Spanish American Novel: Chile and the River Plate Nations (3) Novels from Chile, Argentina, Uruguay and Paraguay. Modern world.


576 Contemporary Spanish American Poetry (3) Major poets in Spanish American from post-modernismo to present day.

577 Spanish American Drama (3) Major playwrights of 20th-century Spanish America.


579 The Spanish American Short Story (3) Short story by major writers in Spanish America from Romanticism to present day, theory and criticism of genre.

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 only.

600 Doctoral Research and Dissertation (3-15) P/NP only. E
### Small Animal Clinical Sciences

**See College of Veterinary Medicine and Comparative and Experimental Medicine**

### Social Work

**College of Social Work**

<table>
<thead>
<tr>
<th>MAJOR</th>
<th>DEGREES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Work</td>
<td>M.S.S.W., Ph.D.</td>
</tr>
</tbody>
</table>

Karen Sowers, Dean

**Professors:**
- Bloch, M. H. (Emeritus), M.S. Ohio State
- Cetingok, M., Ph.D. Washington (St. Louis)
- Faver, C., Ph.D. Michigan
- Fryer, Gideon W. (Emeritus), Ed.D. Columbia
- Gilsson, C.A., Ph.D. Washington (St. Louis)
- Granger, Ben P. (Emeritus), Ph.D. Brandeis
- Hirayama, H., D.S.W. Pennsylvania
- McLarnan, G. (Emeritus), M.S.W. Tennessee
- Mullins, M. Kate (Emeritus), Ph.D. Chicago
- Nooe, Roger M., D.S.W. Tulane
- Orten, J. D. (Emeritus), D.S.W. Alabama
- Rubenstein, H., Ph.D. Chicago
- Shatz, Eunice (Emeritus), Ph.D. Brandeis
- Sowers, Karen, Ph.D. Florida State

**Associate Professors:**
- Bell, W. J., D.S.W. Tulane
- Combs-Orme, Terri, Ph.D. Washington (St. Louis)
- Cruthirds, C. Thomas, D.S.W. Tulane
- Fiene, Judith, Ph.D. Tennessee
- Nugent, W., Ph.D. Florida State
- Orme, J. Ph.D. Washington (St. Louis)
- Spicuzza, Frank M.S.S.W. Tennessee
- Thompson, J., Ph.D. Rutgers
- Vaughn, H. H., Ed.D. Memphis State

**Assistant Professors:**
- Campbell, P. M., D.S.W. Alabama
- Coller, J. C., M.S.W. Tulane
- Crawford, S., M.S.W. Texas
- Davey, Timothy L., Ph.D. Florida State
- Egan, Marla, Ph.D. Maryland
- Marley, Marsha, D.S.W. Tulane
- Neff, James A., Ph.D. Florida State
- Page, Timothy F., Ph.D. Western Michigan
- Patterson, D., Ph.D. Utah
- Rocha, Cynthia, Ph.D. Washington (St. Louis)
- Rogge, Mary, Ph.D. Washington (St. Louis)

Staudt, Marilyn, Ph.D. Washington (St. Louis)

**Field Practice Coordinators:**
- Allen, Sandra (Memphis), M.S.S.W. Tennessee
- Bailes, Melinda (Nashville), M.S.S.W. 
- Betz, Phyllis (Knoxville), M.S.S.W. 
- Texas (Arlington)

**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 management and community practice.

**Admission Requirements**

Admission to the master's program is based on the following requirements:

1. A Bachelor's degree from an accredited college or university with appropriate preparation in the social sciences. At least three-fourths of the applicant's undergraduate work should be in the social sciences, humanities, physical sciences, and other arts and sciences subjects. Applicants must have a course in 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 failing 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 The Graduate School.

3. Personal qualifications acceptable for entrance into the professional practice of social work.

4. All applicants must submit a statement of the graduate Record Examination (general)

Preference is given to applicants with a GPA of 3.0 or above in their undergraduate preparation with substantial work 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, an overall undergraduate GPA of 3.0 or greater, and (3) personal qualifications acceptable for entrance into the professional practice of social work. Students admitted into advanced standing are required to complete a minimum of 42 hours of study in either of the college's concentrations - clinical social work practice or social work management and community practice. These students will follow the curriculum plan and meet all requirements of the concentration during three semesters of study in the program.

Specific information about the advanced standing program is available from the college.

Application for admission to the advanced standing program is through the regular admission process.

**Extended Study**

Planned part-time programs are available in all three branches of the college. Admission requirements are the same as for full-time study. Coursework can be completed over a three-year period. One year of the student's period of study must be on a full-time basis.

**Financial Aid**

Students may apply directly to the University's Financial Aid Office for assistance as the National Direct Student Loan or the Work-Study Program. Other stipends are administered by the College and awarded on the basis of financial need. Applications for these funds must be made to the Branch of the College the student will attend. A student must first apply for University assistance, since College funds are considered supplementary to those of the University. Additional information about College stipends may be obtained from the College of Social Work.

**General Requirements**

1. A minimum of 60 semester hours including completion of foundation courses and field practice (30 hours); at least five courses (15 hours) and two semesters of field practice (12 hours) in the clinical concentration, or at least five courses (15 hours) in the management and community practice concentration; and one elective (3 hours).

2. Students may select a thesis or nonthesis option. Students pursuing the thesis option receive six credit hours for successful completion.

3. Successful completion of a comprehensive exam or defense.

4. An overall GPA of 3.0 or better on all graded courses and satisfactory performance in field.

**The Professional Foundation Curriculum**

The foundation curriculum consists of 30 semester hours in five basic knowledge and skill areas required of all students before entering either of the concentrations. As the initial phase of the educational program, the foundation curriculum contributes to the process of professional identification and presents a comprehensive and broad base of theory, knowledge, and skills from which to operate in the future as practitioners, supervisors, managers, planners and program developers.

Upon completion of the foundation curriculum (at the end of the second semester), students select a concentration in either clinical social work practice or management and community practice.

**Clinical Social Work Practice:** The clinical social work practice concentration focuses on students' developing expertise in providing services to individuals, couples, families, and small groups who are experiencing, or who are likely to experience, serious threats to their personal and social well-being. The concentration emphasizes students' developing theoretical and empirical knowledge and practice skills in differential assessment and intervention directed towards the prevention and amelioration of complex personal, interpersonal, and environmental problems; understanding of, and ability to practice...
ethically and effectively with, socially and culturally diverse populations; and understanding of, and skills in influencing, the organizational context of practice towards the development of new services that may be needed and improvement in the provision of existing services.

Management and Community Practice:

The 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 to provide knowledge and skills in the development of service intervention strategies to address such related needs, and the organizational and management skills that enable practitioners to work in a variety of challenging and turbulent environments. The concentration emphasizes theory and skills related to leadership and administration, and permits flexibility in tailoring a program to fit the student's individual interests, capabilities, and career goals.

Field Practice

Field instruction is a critical component of the student's first- and second-year programs. Through cooperation with a wide range of social agencies and human service programs throughout Tennessee, the college is able to provide field placements in a variety of social work practice areas. The faculty works closely with the placement agencies and the field instructors to assure that students have quality field practice experiences, meeting the objectives of the core curriculum and the concentration.

The college offers a concurrent class and field plan. Students are in field two days per week during the first year and three days per week in the second year.

First-year agency placements are selected to provide experiences related to the foundation curriculum content. Within the placement, each student's experiences are planned and designed according to educational objectives.

Second-year placements are selected according to the student's area of concentration, individual career interests, and educational needs. The student actively participates with the field practice coordinator and the educational committee in selection of the second-year placement. The second-year field placement experience focuses on the integration of social work knowledge and values, and emphasizes the acquisition and development of practice skills.

Students are responsible for meeting the requirements of their placement agencies in terms of office hours and workload coverage. This responsibility takes precedence over scheduled University breaks and may result in variations in holidays and office hours for the student.

Students receiving a grade of NC in field practice may not repeat the field practice.

Transfer Credits

Coursework equivalent to the first year of the master's program, completed in another accredited graduate social work program, is usually accepted toward degree requirements. Applicants must meet the admission requirements of The Graduate School and the College of Social Work. Transfer courses must be approved as equivalent to required and/ or elective courses taken for graduate credit.

Passed with a grade of B or better. An S (earned on an S/NC system) for the field practicum is also accepted. In addition, transfer courses must be part of an otherwise satisfactory graduate program (B average) and be approved by the dean. This coursework must be completed within the six-year period prior to the receipt of the degree.

A maximum of 30 semester credits from work earned in disciplines other than social work may be transferred as elective credits. The student's academic committee must approve the request and the transfer credit must meet Graduate School requirements.

Proficiency Examination

Students in the master's program may earn a maximum of nine hours by proficiency examination, with the exception of field practicum courses. Students interested in proficiency examinations are referred to The Graduate School statement describing the procedure for applying for examination.

THE DOCTORAL PROGRAM

The College of Social Work offers the Doctor of Philosophy with a major in Social Work.

The focus of social work education at the doctoral level is to foster the development of an attitude of scientific inquiry, knowledge of the scientific method, ability to extend the knowledge base of social work practice, and effective participation in leadership roles in social work education, research, and practice.

The emphasis of the doctoral program is upon:

--The analysis of direct intervention and social administration and of the interrelationships among each of them and their social policy, organizational, and community contexts.

--Research-based knowledge to inform and guide social work practice, social policy, and social welfare program development.

The program consists of foundation courses, elective courses, and dissertation research. The courses are available only in Knoxville. Students and their committees can develop a plan for completing their research in Nashville and Memphis based on the availability of dissertation resources.

Students have the opportunity to work in the Children's Mental Health Services Research Center, a National Institute of Mental Health research center, as part of their training. The Center is one of the three such centers nationwide and focuses on services to children who have experienced mental health problems associated with abuse, neglect, violence, and a variety of psychosocial problems.

Admission Requirements

The Ph.D. program is designed for students who have completed a master's degree in an accredited school of social work and have post-master's social work/social welfare experience. Applicants who do not meet these requirements, but believe they have equivalent credentials should contact the Chair of Ph.D. program for further information regarding admissions criteria.

General Requirements

1. A minimum of 63 hours beyond the master's degree including: a) completion of 24 hours of required coursework, b) completion of 15 credits of advanced electives, at least 12 of which are taken outside the department, 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 course work, electives, and dissertation research. The foundation curriculum consists of 24 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 foundation curriculum is completed and elective coursework begun during the first year of study. The elective requirement is 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 and Statistics 531 and 532 or any two graduate level statistics courses approved by the Doctoral Program Chair.

Examinations

All doctoral students are required to pass a qualifying examination and a comprehensive examination. The qualifying examination covers the foundation curriculum. The comprehensive examination is administered by members of the doctoral committee and is designed for the student to demonstrate comprehensive knowledge of the major and cognate areas and the dissertation topic. In case of failure of either examination, the student may request a retake. The result of the second examination is final.

Financial Aid

Financial aid is available to qualified students in the form of fellowships, scholarships, and teaching and research assistantships. Graduate assistantships and other forms of assistance are awarded on the basis of merit and interest to applicants who are accepted into the Ph.D. program.

MINOR IN GERONTOLOGY

Graduate students in the College of Social Work may pursue a specialized minor in gerontology. This interdepartmental/interdisciplinary minor gives the student an opportunity for combining the knowledge about aging in American society with his/her major concentration. Please refer to Human Ecology for specific requirements.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The M.S.S.W. and Ph.D. programs in
Social Work are available to residents of the state of Arkansas; the Ph.D. to residents of Oklahoma or West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

NOTE: Graduate students majoring in fields other than social work are admitted to certain social work courses with the approval of the College of Social Work and the student's major professor.

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

501 Foundations of Social Work Practice (3) Survey of history, mission, and identity of profession. Basic theory, values, and methods social work practice at various systemic levels. Assessment, planning, communication, intervention, and evaluation skills. Prereq: Admission to College or consent of instructor. F

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

503 Foundations of Social Work Practice II (3) General practice with individuals, families, and small group systems. Emphasis on developing theoretical and practical frame for understanding of such systems and their adaptation to environments. Various social work roles and intervention strategies pertaining to each client system. Prereq: 501 or consent of instructor. F

505 Social Work Practice in the Community (3) Basic theory, methods, problems, and strategies in implementation of planned change among families, groups, and communities. Emphasis on developing theoretical frame for understanding of such systems and their adaptation to environments. Various social work roles and intervention strategies pertaining to each client system. Prereq: 501 or consent of instructor. F

506 Social Work Research (3) Research methodologies with respect to evaluation and application to social work theory and practice. History and philosophy of science; problem formulation; research design; ethics; instrumentation; data collection; analysis and reporting; and evaluation and utilization of research. Prereq: Admission to college or consent of instructor. SP

508 Practicum in Social Work Research (3-6) Supervised practice in application of research methods to social work. Prereq: 506. Fall only. Faculty of course conducting investigation. May be repeated. Maximum 6 hrs. S/NC only. E

509 Graduate Seminar in Public Health (1) Same as Public Health 509, Exercise Science 509, Nutrition 509, and Nursing 509.

514 Human Behavior in the Social Environment I (3) Theories pertaining to individual, family, and group development while emphasizing relationships among biological, psychosocial, and cultural contexts. Dynamics of behavior in context of social structures: race, ethnicity, social class, gender roles. Prereq: Admission to College or consent of instructor. F

515 Human Behavior and Social Environment II (3) Patterns of adaptation and maladaptive behavior, including different theories, models, and criteria. Interactions among individuals, families, organizations, communities in maladaptive behavior: mental illness and abusive behavior. Prereq: 514 or consent of instructor. SP

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-level social change is accomplished. Prereq: 514 or consent of instructor. SP

518 Social Work and Oppression (3) Sources, dynamics, and impact of oppression in U.S. society as manifested in both social/ecological systems and personal experience. Connections among various forms of oppression: racism, sexism, classism, and heterosexism. Forces which perpetuate such conditions. Prereq: Admission to College or consent of Instructor. F

521 Clinical Social Work Practice with Individuals (3) Theories, knowledge, and skills for clinical practice with individuals from various systemic levels. Therapeutic process, treatment strategies, and client quality assessment from psychodynamic and cognitive practice models. Prereq: Foundation or consent of instructor. F

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. Treatment of personal and family problems in terms of application to families with varied system and individual problems and to families from varied social and cultural backgrounds. Prereq: Completion of foundation or consent of instructor. F

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. Prereq: Completion of foundation or consent of instructor. SP

526 Research for Assessment of Social Work Practice (3) History and philosophy of social work research and its application to social work practice. Prereq: ADM 222 or consent of instructor. SP

530 Seminar in Clinical Social Work (3) Topic in theory and practice of social work with various systems, couples, families, and groups. Prereq: Completion of foundation or consent of instructor. F

532 Short-Term Treatment (3) Theory and practice of short-term treatment. Prereq: Completion of foundation or consent of instructor. SP

533 Social Work Treatment with Couples (3) Theories regarding contemporary marriage styles, problem areas in relationships, and application of treatment methods and skills for problem resolution. Prereq: Foundation or consent of instructor. F

534 Social Work Treatment with Children and Adolescents (3) Examination of various treatment modalities for assessing and treating children and adolescents. Prereq: 500 or consent of instructor. F

535 School Social Work (3) Place of school as community institution and resource. Methods, processes, and techniques employed in school social work. Prereq: Foundation or consent of instructor. F

541 Leadership and Management in Human Services (3) Management, leadership, and supervisory skills required in development and management of human service delivery systems. Issues regarding human resource management, resource allocation, strategic planning, and organizational dynamics. Prereq: Completion of foundation or consent of instructor. F

543 Fiscal 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, experience control, fundraising, grant writing, marketing, and evaluation. Prereq: Foundation or consent of instructor. F

547 Evaluation Research (3) History and philosophy of social work research and its application to social work practice. Prereq: ADM 222 or consent of instructor. F

580 Seminar in Gerontology (1) (Same as Human Ecology 585, Counseling Education and Counseling Psychology 585, Exercise Science 585, Nursing 585, Public Health 585, Psychoeducational Studies 585, and Sociology 585.)

593 Independent Study (1-6) Individualized study, student selects, designs, and completes examination of special issue or problem. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. F, SP

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

601 Research for Social Work Practice I (3) Epistemological and methodological considerations for both quantitative and qualitative research for social work practice. F

602 Research for Social Work Practice II (3) Epistemological and methodological considerations for both quantitative and qualitative research for social work practice. SP

604 Research in Social Service Settings (3) Advanced research, under faculty supervision, of practice issues in community agency. Prereq: First year required Ph.D courses or consent of instructor. May be repeated. Maximum 8 hrs. F, SP

608 Evaluative Research for Social Work Practice, Program Evaluation, and Policy (3) Techniques and strategies for quantitative and qualitative analysis for social policy's impact on individuals and groups and for evaluating processes and outcomes of social work practice. F


613 Social Work Practice and Its Social Context II (3) Critical analysis of knowledge bases of major practice modalities in administrative and planning. SP

640 History of American Social Work (3) Social, cultural, economic and political contexts for development of social work profession, development of education for profession, and modern welfare system. F

650 Programs and Legislation for Children and Families (3) Background, purposes, and current issues surrounding major social welfare and health programs servicing...
Sociology

(College of Arts and Sciences)

MAJOR DEGREES

Sociology ............................................. M.A., Ph.D.

Michael L. Benson, Head

Professors:
Betz, D. Michael, Ph.D. .................. Michigan State
Black, James A., Ph.D. .................... Iowa
Gaventa, John P., Ph.D. ................. Oxford
Hastings, Donald W., Ph.D. .......... Massachusetts
Hood, Thomas C., Ph.D. .............. Duke
Perrin, Robert G. (Liaison), Ph.D. ... British Columbia
Shover, Neal, Ph.D. ....................... Illinois
Wallace, Samuel E., Ph.D. ........... Minnesota

Associate Professors:
Benson, Michael L., Ph.D. .......... Illinois
Cable, Sherry, Ph.D. .................. Penn State
Jalata, Asafa, Ph.D. ................. SUNY (Binghamton)
Kurth, Suzanne B., Ph.D. ......... Illinois (Chicago)

Assistant Professor:
Jones, Robert E., Ph.D. ............. Washington State

The Sociology Department offers graduate study leading to the Master of Arts and the Doctor of Philosophy. The M.A. program includes a thesis or non-thesis option. The graduate program has concentrations in criminology; energy, environment, and resource policy; and political economy. The criminology concentration includes 505, 551, 653, and 655. The energy, environment and resource policy concentration includes 560, 563, 661, 662, and 665. The political economy concentration includes 504, 540, 541, 643, 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 Director of Graduate Studies in Sociology. All incoming students will be advised by the Director of Graduate Studies. New students are admitted in fall semester only and applications must be received by the Graduate Admissions and Records Office by February 1.

ADMISSION REQUIREMENTS

1. Acceptable scores on the general Graduate Record Examination (verbal, quantitative, and analytical) are required. GRE scores in the subject area (Sociology) are requested but not 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 6 hours of Thesis 550, is required. Students must complete Sociology 521, 531, Statistics 531, and one foundation course (504, 505, or 560). At or near the end of all coursework, the student must take an oral examination on course material and thesis. The examination will be administered by the student's committee.

Non-Thesis Option
A minimum of 30 hours of coursework is required, including Sociology 521, 531, Statistics 531, and one of the following: 504, 505, or 560. Sociology 534, 622, and Statistics 532 are recommended. Sociology courses at the 400 level may be taken with the approval of the student's committee. A student's plan of study should follow one of the following approaches: Plan 1, 6 hours in one of the department's concentrations and 6 hours in a second area, including areas outside the department, subject to the approval of the student's committee; Plan 2, 12 hours in a special area of study approved by the student's committee and the department's Graduate Program Committee.

THE DOCTORAL PROGRAM

Coursework
Twenty-four hours of coursework beyond the master's degree are required (exclusive of S/N 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, or 566; and Statistics 532 or another approved course in statistics. Completion of 9 hours in each of two concentrations is encouraged. A student who cannot achieve his/her educational goals within the department's concentrations may construct an individualized course of study subject to the approval of the student's doctoral committee and the Graduate Program Committee. Sociology courses at the 400 level may not be taken without the consent of the student's advisor and the Graduate Program Committee.

Six hours may be taken in related fields without petitioning the Graduate Program Committee for approval. The student's program may include a minor or cognate field.

Comprehensive Examinations
Written examinations in four areas are required (sociological theory, research methodology, and two substantive areas). Doctoral students are eligible to take the theory and methodology examinations whenever offered. Substantive examinations may be taken upon completion of theory and methodology examinations. Detailed information on examination and examination options (generalist, specialist, and colateralist) may be obtained from the department.

Dissertation and Final Examination
A dissertation based on original research must be completed (24 hours). The candidate must pass an oral defense of the dissertation, including the theory and methodology related to the research, in accordance with the deadlines specified by The Graduate School.

MINOR IN ENVIRONMENTAL POLICY

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

MINOR IN GERONTOLOGY

Graduate students in the Department of Sociology may pursue a specialized minor in gerontology. This interdisciplinary minor gives the student an opportunity to combine the knowledge about aging in American society with his/her major concentration. Please refer to Human Ecology for specific requirements.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The M.A. program in Sociology is available to residents of the state of Virginia (concentration in criminology only); the Ph.D. to residents of West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

405 Sociology of Sport (3) Social meaning, organization, and process of sport. Prereq: 291 or consent of instructor.

414 Sociology of Health Care (3) Organization of health care facilities, staff-patient relationships, demographic characteristics, and prevalence of disease.

415 Sociology of Aging (3) How roles and statuses change with age in relation to major social institutions; the impact of rising number of elderly people on society, effect of society on older people.


455 Society and Law (3) How laws and legal processes are affected by social change, social impact of legal sanctions, relations between law and social justice.
459 Organizational and Corporate Crime (3) Analysis of crime and deviance committed by organizations, case studies of corporate and organizational crime, organizational dynamics of crime, theories of corporate crime, and organized responses to this type of crime by governmental regulatory agencies.
462 Population (3) Demographic factors and social structure: trends in fertility, mortality, population growth, migration, distribution, and composition; population policy.
464 Urban Ecology (3) Relations of humans to their urban environment: conservation and use of appropriate technology. (Same as Urban Studies 464.)
471 Sociolinguistics (3) (Same as English 471 and Linguistics 471.)
480 Diffusion of Agricultural Technology (3) (Same as Rural Sociology 480.)
500 Thesis (1-15) P/NP only.
502 Registration for Use of Facilities (3-15) Required minimum time before degree is completed. May be used toward degree requirements. May be repeated. S/NC only.
504 Sociological Foundations of Political Economy (3) Survey of contemporary sociological theories of political economy, sources of political and economic power and conflict.
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.
540 Occupations (3) Occupations in relation to individuals and society, technology, economic stratification, and social organizations.
541 Collective Behavior, Social Movements, Social Change (3) Basic theory and research on conditions of social unrest in human collectivities and efforts of collectives to change existing society.
543 Sociology of Development (3) Sociological theories and studies of development: modernization, colonialism, dependency; comparative impact of various development paths upon selected aspects of social structure and change.
551 Delinquency and the Social Structure (3) How study of delinquency and juvenile justice is affected by changing structures of childhood and adolescence, changing demographic and institutional influences, and changing views about responsibility and punishment.
560 Environmental Sociology (3) Systematic treatment of current research in environmental sociology. Social impact analysis and conflict over environmental issues.
563 Demographic Techniques (3) Standard rates and measures of demographic variables, life table analysis, increment-decrement models, and survey techniques of population analysis.
580 Advanced Rural Sociology (3) (Same as Rural Sociology 580.)
591 Foreign Study (1-15) See College of Arts and Sciences.
592 Off-Campus Study (1-15) See College of Arts and Sciences.
593 Independent Study (1-15) See College of Arts and Sciences.
594 Social Theory of Sport (3) (Same as Physical Education 515.)
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 surveys. 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 methodologies. 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.
643 Class Analysis (3) Critical analysis of theories and research on class structure and conflict.
644 Political Sociology (3) Critical examination of theories of state and political processes.
645 Advanced Studies in Political Economy (3) (Same as Sociology 645.) Critical examination of selected topics in sociology of law. Prereq: 504 or consent of instructor. May be repeated. Maximum 6 hrs.
649 Supplementary Readings (3) Prereq: Consent of department. May be repeated. Maximum 6 hrs. S/NC only.
653 Sociology of Law (3) Intensive examination of selected topics in sociology of law. Prereq: 505 or consent of instructor.
655 Advanced Studies in Criminology (3) Intensive examination of selected topics in criminology. Recommended prereq: 505. May be repeated. Maximum 6 hrs.
661 Theory and Methods of Human Ecology (3) Historical and contemporary studies of interaction between humans and their environment. Prereq: Consent of instructor.
662 Urban and Regional Sociology (3) Historical and contemporary studies of urban and regional regions with comparisons to other regions.
665 Advanced Studies in Energy, Environment and Natural Resources Policy (3) Topical seminar covering particular lines of research and theory within area. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.
675 Advanced Studies in Social Psychology (3) Selected contemporary research issues related to social psychological theories. Prereq: 541 or consent of instructor. May be repeated. Maximum 6 hrs.
685 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.
689 Tutorials in Advanced Topics (3) Individual instruction. Prereq: Consent of department. May be repeated. Maximum 6 hrs.

Spanish
See Romance and Asian Languages

Special Programs

GRADUATE COURSES

510 Humanities Perspectives in the Arts and Sciences (3) Seminar on nature of inquiry in humanities. Emphasis on nature and special forms of human experience and its interpretation through study of formative texts and critical figures.
520 Natural Science Perspectives in the Arts and Sciences (3) Seminar on nature of inquiry in physical and biological sciences drawing on history of science, critical figures in shaping of scientific thought, and methodology for observation and experimentation in natural sciences.
530 Social Science Perspectives in the Arts and Sciences (3) Seminar on nature of inquiry in social sciences. Emphasis on methodology for observation and research in study of human beings, their social environments and their behavior.

Speech Communication

(College of Communications)

John Haas, Head

Professors:
Julian, Faye D. (Liaison), Ph.D. ............. Tennessee
Lester, Lorayne W., Ed.D. .................. Tennessee
Yeomans, G. Allan (Emeritus), Ph.D. ........... Louisiana State

Associate Professors:
Ambrester, M. L., Ph.D. ..................... Ohio State
Cook, N. C., M.A. ........................... Alabama
Haas, John W., Ph.D. ..................... Kentucky

Assistant Professors:
Ambler, R. S., Ph.D. ........................ Florida State
Arnold, Christa L., Ph.D. ................... Florida

Graduate courses in Speech Communication provide opportunities for students in a variety of disciplines to investigate how oral language can affect changes in the knowledge, the understanding, the ideas, the attitudes, or the behavior of other human beings.

GRADUATE COURSES

420 Communication and Conflict (3) Communication as significant factor in development, management, and resolution of conflict at interpersonal, small group, organizational or societal levels.
425 Interpersonal Health Communication (3) Interpersonal communication in health care settings: provider-client interactions, social support groups, stigma and discrimination, and contemporary models explaining use of health-related information.
440 Organizational Communication (3) Organizational settings and variables of communication process that affect quality of human interaction both within and outside organization.
465 Studies in Rhetorical History and Criticism (3) May be repeated. Maximum 6 hrs.
468 Rhetoric of the Woman's Rights Movement to 1930 (3) Historical and critical study of public address in campaigns for women's rights in United States from 1830's through 1920's. (Same as Women's Studies 468.)
The following retention policy applies to all graduate students seeking a degree in this unit: 1. Graduate students are required to maintain an overall GPA of 3.0. 2. Any student who falls below this standard will be advised in writing by the unit leader of the need to discuss the matter with his/her advisor. 3. If a student's overall GPA remains below 3.0 for a second semester, the student will have his/her degree status revoked.

GRADUATE ASSISTANTSHIPS

A limited number of graduate assistantships are available for qualified women and men who are graduates of accredited colleges or universities. These assistantships are open to students in the master's program. Students interested in these opportunities should file their applications before February. Letters should be addressed to Graduate Assistantships Coordinator, Sport and Physical Activity unit, The University of Tennessee, Knoxville, TN 37996-2700.

The following retention policy applies to all graduate students seeking a degree in this unit: 1. Graduate students are required to maintain an overall GPA of 3.0. 2. Any student who falls below this standard will be advised in writing by the unit leader 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 COURSES

415 Development and Maintenance of Leisure, Sport, Tourism Services (3) Same as Recreation and Tourism Management 415.

440 Sport Marketing (3) Application of fundamental marketing concepts to sport industry. Marketing research, promotions, fund raising, advertising, and assessment of marketing programs specific to sport. Historical development of sport marketing. Prereq: Marketing or consent of instructor.

500 Thesis (1-15) Only. E

501 Special Project (3) Culminating experience for non-thesis major. Research study suitable for publication, or practice requiring special written work. Prereq: 532.

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities or an activity other than a degree requirement. May be repeated. S/N only. E


511 Administration/Supervision in Sport (3) Development of knowledge and analytic skills desirable for managers/administrators in sport business/organization: organizational, administrative, and supervisory strategies related to sport in profit and non-profit settings. F, Sp

512 Application of Legal Concepts to Sport Settings (3) Application of contract law, breach of contract, and monetary damages within sport settings: risk assessment and development of effective risk management strategies; development of contracts in sports; and analysis of cases involving discrimination based upon gender, race, and age as well as protection of rights at amateur and professional levels of sport. F, Sp

532 Research Techniques in Sport (3) Evaluate, compare, and contrast research techniques in sport with consideration for and experiences in appropriate review, design, analysis procedures, and proposal development. F, Su

535 Ethics in Sport Administration (3) Development of ethical and legal perspectives in sport administration. Prereq: 532.

544 Theories of Leadership and Leader Behavior in Sport (3) Integration of various theoretical approaches to leadership styles in sport administration within cultural contexts, research, and field experiences. Sp

Statistical Analysis

To determine the effectiveness of the intervention, statistical analyses were conducted to compare pre- and post-treatment scores. The t-test was used to assess differences in mean scores between the intervention and control groups. The results indicated a significant improvement in physical activity levels post-intervention for the intervention group compared to the control group. These findings support the hypothesis that the intervention program was effective in increasing physical activity participation among school-aged children.

Analysis of Variance

An ANOVA was conducted to evaluate the impact of the intervention on the study participants. The results showed a significant main effect for the intervention group, indicating a statistically significant difference in physical activity levels between the groups post-intervention. This suggests that the intervention program played a role in increasing physical activity participation.

Conclusion

The intervention program was effective in increasing physical activity levels among school-aged children. The results support the importance of implementing evidence-based programs in schools to promote physical activity participation and healthy lifestyles. Further research is recommended to explore the long-term effects of such interventions and to identify effective strategies for sustaining increased physical activity levels.
Additional Intergovernmental Program Faculty:
Bunting, Dewey, Arts and Sciences; Chatterjee, Arun, Engineering; Dessart, Don, Education; Dyer, Carl, Human Ecology; Fitzpatrick, Ben, Arts and Sciences; Frifout, Henry, Agricultural Sciences and Natural Resources; Gant, Michael, Arts and Sciences; Glisson, Charles, Social Work; Gross, Louis, Arts and Sciences; Huck, Schuyler, Education; Ladd, R. T., Business Administration; Lounsbury, John, Arts and Sciences; Livesay, Carl, Human Ecology; Lounsbury, John, Arts and Sciences; Miller, Mark, Communications; Orme, John, Social Work; Ploch, Don, Arts and Sciences; Rajpet, Balram, Arts and Sciences; Richardson, Jr., Lillard, Arts and Sciences; Rosing, Jan, Arts and Sciences; Saxton, Arnold, Agricultural Sciences and Natural Resources; Singletary, Michael, Communications; Smith, Julius, Arts and Sciences; Wagner, Carl, Arts and Sciences.

THE MASTER'S PROGRAM

The M.S. program in Statistics provides students with the foundations in theory and practice required for careers in applied statistics. In addition to the education traditionally offered in such a program, the department offers a concentration in industrial statistics, which provides unique opportunities for students with the foundations in theory and the practical applications of statistics. Through involvement in The University of Tennessee Institute for Productivity Through Quality 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 and hold joint appointments with the College of Agriculture, the Computing Center and the Medical College. Intercollegiate 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 weaknesses in which they may prepare themselves for the program by taking coursework as non-degree students. Requests for application forms and further information may be sent to the Director of Graduate Studies, Department of Statistics, Stokely Management Center, University of Tennessee, Knoxville, TN 37996-0532 or e-mail: wsker@utk.edu or http://funnelweb.utk.edu/~stat/programs.html.

Admission Requirements

General admission requirements for The Graduate School are stated beginning on page 12. Applicants for Statistics must submit results of the Graduate Record Examination (GRE) general portion, although GMAT exam scores may be substituted. Applicants for the statistics program must have completed at least two year's college-level mathematics, including the calculus of several variables and matrix algebra, and be proficient in a computer language. Applicants whose native language is other than English must submit results of the Test of English as a Foreign Language (TOEFL).

Curriculum

A minimum of 33 credit hours must be completed for the master's degree. Required of all students are 6 hours in statistical methods, 6 hours in statistical theory, 1 hour in statistical computing, and 3 hours in either supervised consulting or internship. 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 full 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

<table>
<thead>
<tr>
<th>Degree Program</th>
<th>Hours in Approved IGSP Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master's in home department, minor in Statistics</td>
<td>9</td>
</tr>
<tr>
<td>Master's in home department, M.S. in Statistics</td>
<td>24</td>
</tr>
<tr>
<td>Doctorate in home department, minor in Statistics</td>
<td>15</td>
</tr>
<tr>
<td>Doctorate in home department, M.S. in Statistics</td>
<td>24</td>
</tr>
</tbody>
</table>

*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. 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 faculty member from the Department of Statistics at the rank of Assistant Professor or above.

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.

This degree provides students with a broad knowledge of the field of statistics, the ability to apply statistics in practical situations to problems of business and industry and the ability to develop new statistical methods; all of which takes place while students are exposed to coursework in the basic functional areas of business.

Minimum course requirements are: 673, 666, 691, and 592.

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. E

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


531 Survey of Statistical Methods I (3) Univariate and bivariate data collection and organization, statistical estimation and hypothesis testing. Analysis of relationships for categorical and numerical data, including Chi-square tests and simple linear and quadratic regression. Use of computing facilities. Coreq: not given for both 531 and 537. Prereq: 1 yr. college mathematics. E

532 Survey of Statistical Methods II (3) Multiple linear regression, including use of dummy variables; simple and multiple factor analysis of variance and covariance, issues in experimental design and analysis. Use of computing facilities required. Prereq: 531. E

537 Statistics for Research I (3) Principles and application of statistical methodology, integrated with consideration of use of major statistical computer systems. Probability and probability distributions, combining and testing hypotheses using parametric and nonparametric inference methods. Matrix-based computer regression and correlation. Credit not given for both 531 and 537. Prereq: 1 yr. undergraduate mathematics and 1 undergraduate statistics course. F

539 Statistics for Research II (3) General linear model as applied to multivariate analysis of variance. Diagnostic and influence techniques. One-way, factorial, blocking, and nested designs, planned versus posthoc contrasts. Random factors and repeated measures. Prereq: 537 or 532. Sp

561 Introduction to Computing for Data Management and Analysis (1) UTK computing environment for beginning statistics graduate students. Use of operating system commands, system editor, utility programs and SAS statistical package for data entry and output handling. Requirements and statistical analysis. Use of UTCC computing facilities required. Coreq: 531, 537 or 531, or consent of instructor.


564 Theory of Statistical Inference (3) Introductory theory underlying common statistical procedures of hypothesis testing and estimation. Prereq: 563.

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 tolerance intervals and evaluation of variance components, problems of measurement, special industrial applications. Prereq: 571 or equivalent.


572 Applied Linear Models (3) Simple and multiple linear regression using algebra and general linear model: polynomial regression, weighted least squares regression, variable selection techniques, multilinearly, regression diagnosis and linear model approach to analysis of data from designed experiments. Use of standard computer packages. Prereq: 571 and matrix algebra.

573 Design of Experiments (3) One-way ANOVA, multiple range tests, equal and unequal variances, transformations; factorial experiments, complete and incomplete designs, analysis of covariance, split-block and nested designs, fractional factorials, sequential designs. Prereq: 571.

575 Applied Time Series (3) Fundamental conceptual and 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.


583 Special Topics in Applied Statistics (1-3) May be repeated. Maximum 9 hrs.

586 Principles of Statistical Process Management (1-3) Statistical and other techniques applied to management of organizational processes. Prereq: Consent of department head.

587 Graduate Seminar in Applied Statistics (3) Presentation of specialized topics in probability or statistics. Writtent report and presentation required. Prereq: Consent of department head.

589 Statistical Consulting Practice (1-6) Supervised experience helping off-campus researchers plan, manage data, and develop and perform analyses specific to designs and hypotheses. Discussion of activities in regular seminar meetings. Final written reports and final oral presentations. Prereq: 572 or 538. May be repeated. Maximum 9 hrs. S/N or letter grade.

598 Statistical Simulation (1-6) Simulation experience helping off-campus researchers plan, manage data, and develop and perform analyses specific to designs and hypotheses. Discussion of activities in regular seminar meetings. Final written reports and final oral presentations. Prereq: 572 or 538. May be repeated. Maximum 9 hrs. S/N or letter grade.

599 Statistical Simulation (1-6) Supervised experience helping off-campus researchers plan, manage data, and develop and perform analyses specific to designs and hypotheses. Discussion of activities in regular seminar meetings. Final written reports and final oral presentations. Prereq: 572 or 538. May be repeated. Maximum 9 hrs. S/N or letter grade.

664 Advanced Statistical Process Control (3) Development of advanced SPC concepts; theory governing properties of Shewhart-type control charts. Comparisons with competing methodologies. Readings and discussion based on current literature. Prereq: 564 and 566.

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.

675 Categorical Data Analysis (3) Log-linear analysis of multidimensional contingency tables. Logistic regression. Topics include application and use of statistical software. Prereq: 1 yr. graduate-level statistics, regression analysis and analysis of variance and familiarity with UNIX or consent of instructor.

677 Statistical Modeling (3) Modern techniques of 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 computer tools. Prereq: 564 and 572 or 538, or consent of instructor.

681 Special Topics in Probability (1-3) Presentation of specialized topics in probability and stochastic processes. May be repeated. Maximum 6 hrs.

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 or letter grade.

Theatre (College of Arts and Sciences)

MAJOR

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

Tom Cooke, Head

Professors:

Cooke, Tom, Ph.D. .....................................Florida State
Cotrnan, R. M. ........................................Catholic
Custer, M., M.F.A. .....................................Wisconsin
Field, R. C., M.A. ......................................Miami (Ohio)
Mashburn, Robert R., Ph.D. .........................Florida State
Soper, Paul L. (Emeritus), Ph.D. .....................Cornell

Associate Professors:

Black, W., M.F.A. .....................................Illinois
Craven, E. H., M.A. ...................................Tennessee
Croakley, R. J., M.F.S. .........................Southern Methodist
DeCuir, L. J. (Liaison), M.F.A. ....................Tulane
Gould, B. K., M.F.A. .................................Catholic

Assistant Professor:

Van den Berg, Klaus, Ph.D. .........................Indiana
Weber, T., M.F.A. ......................................Alabama

The Department of Theatre offers the Master of Fine Arts degree with a major in
Theatre, concentrations in acting, scene design, costume design, lighting design and theatre technology. Not all areas of concentration accept applicants every year. Applicants must have completed undergraduate degrees approximately equivalent in requirements to those specified for degrees conferred by The University of Tennessee, Knoxville.

Three letters of recommendation and interviews with appropriate faculty are required of all applicants. Applicants for admission to the M.F.A. design/technical theatre programs must submit samples of their work. Auditions are required of M.F.A. degree acting applicants. For detailed information about the graduate program, contact the Director of Graduate Studies, Department of Theatre.

THE MASTER OF FINE ARTS PROGRAM

At least 60 semester hours, 40 of which must be at the 500 level or above, are required for the degree of Master of Fine Arts with a major in Theatre, which is normally to be completed in three consecutive years of full time residence. Theatre 501 is required the first year of residence. Theatre 510 and 512 are also required of all students. 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 committees for the M.F.A. degree program. Theatre 599, Projects in Lieu of Thesis, and an oral defense of the project must be completed satisfactorily before the degree is conferred.

In addition to the core requirements listed above, each area of concentration has specific requirements:

**Design/Technical Production**

Required courses are at least 12 hours of Theatre 580, Design and Technical Production Seminar, and at least 6 hours in the projects courses. Theatre 401, Principles of Design is required in the first year of residence.

**Acting**

Theatre 520-21-22-23-24-25 Master Class are required, along with one course in directing and two hours each in voice and dance.

**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 M.F.A. degree with approval of the student's committee, the Dean of the College of Arts and Sciences, and the Dean of The Graduate School.

Any such credits applied from a previous graduate program would be from courses that are directly relevant to the student's MFA curriculum and must have been earned within the time limit (6 years) established for completion of the MFA degree.

**GRADUATE COURSES**

401 Principles of Theatrical Design (3) Fundamental principles of design; visual and structural relationships. Projects assigned to develop understanding and perception.

409 Stage Make-up (3) Study and problems in make-up design and application: character analysis. Prereq: Introduction to Theatre.

420 Special Studies in Acting (3) Content varies. Experiences in selected concentrated areas such as style, techniques, approaches, e.g., Shakespeare, movement, humor. Prereq: Advanced Acting and consent of instructor. May be repeated. Maximum 8 hrs.

423 Period Movement and Dance (2) Movement styles and dances from Renaissance to 20th century. Prereq: Stage Movement or consent of instructor.

424 Theatre Dance II (2) Advanced dance technique incorporating elements of musical theatre. Prereq: Theatre Dance or consent of instructor. May be repeated. Maximum 6 hrs.

425 Selected Musical Theatre Technique (3) Study and practice of musical theatre material; dance and vocal work. Prereq: Theatre Dance or consent of instructor. May be repeated. Maximum 4 hrs.

426 Applied Phonetics (3) Development of skills in transcription and reproduction of principal varieties of English Language in North America and Great Britain and selected foreign dialects in North America. Prereq: Consent of instructor.


445 Advanced Costume Construction (3) Advanced studies in costume construction technique, tailoring, vacuum forming, plastic molding, and coutiling. Prereq: 345 or consent of instructor.

446 Costume Patternning (3) Draping patterns for period costumes. Coserity and study of historical patterns 1500-1900. Prereq: 345 or consent of instructor.

450 Advaneced Scenery Technology I (3) Study and practice of theatre woodwork and 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 (3) Introduction to materials, techniques, and principles of craft. Gaining skill and understanding through studio experience. Prereq: Consent of instructor.


466 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 problems in lighting design theory and practice. Lighting musical theatre, opera, and dance. Prereq: 362 or consent of instructor.

464 Computer Assisted Design for Theatre (3) Advanced techniques in computer assisted design for theatre. Work with CAD, Computer Drawing, Graphics, etc. 3D Modeling software for preparation of theatrical designs. Specfict content varies with semester. Admission by consent of instructor only. May be repeated. Maximum 9 hrs.

470-71 Playwriting (3,3) Advanced instruction in writing of plays. Prereq: Consent of instructor.

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

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

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

501 Introduction to Graduate Research in Theatre (3) Research tools and methods for research and scholar.

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. Maximum 8 hrs.

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 a variety of analyti- cal approaches from Aristotelian to Structuralist.

520-21-22-23-24-25 Master Classes in Acting (6,6,6,6,6,6) Master classes in acting techniques, voice, and movement. Theatre MFA students only.

536 Projects in Play Directing (3) Practical work in play direction involving various lengths and kinds of scripts. May be repeated. Maximum 9 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 (2) Fibers, dyes and dye processes; color matching and distracting.

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.


553 Projects in Scene Design (1-3) Conception and completion of major projects, both theoretical and practical, in scene design. May be repeated. Maximum 9 hrs.

554 Studies in Scene Design (3) Advanced scene design techniques and approaches to design for complex dramas and varied dramatic forms. May be repeated. Maximum 9 hrs.

555 Advanced Scenery Painting (2) Advanced instruction in materials, techniques, and principles of scene painting: studio experience in dimensional simulation, full-scale design and three-dimensional design. Prereq: 454 or consent on instructor.

560 Projects in Lighting Design (1-3) Conception and completion of major projects, both theoretical and practical, in lighting design. Prereq: Consent of Instructor. May be repeated. Maximum 9 hrs.

562 Special Problems in Lighting Design (3) Advanced problems in lighting design and theory, problems in Broadway production and touring. Prereq: 462 or consent of instructor.

570 Dramaturgy: Theory and Practice (3) Methods and materials. Prereq: Consent of instructor.

580 and Technical Production Seminar (1-6) Selected aspects of design and technical production. Prereq: Consent of instructor. May be repeated. Maximum 16 hrs.

585 Production Workshops (1-6) Directed experience in production collaborations. Prereq: Consent of instructor. May be repeated. Maximum 12 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.
Transportation
See Marketing, Logistics and Transportation.

Veterinary Medicine
(College of Veterinary Medicine)

MAJOR DEGREE
Veterinary Medicine .................. D.V.M.
Comparative and Experimental Medicine .......... M.S., Ph.D.

THE PROFESSIONAL PROGRAM

Admission Requirements
To qualify for admission to the professional program of the College of Veterinary Medicine, a candidate must have completed at least the minimum 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, Knoxville. Pre-veterinary course requirements must be completed by the end of the spring term of the year in which the student intends to enroll. Biochemistry requirements must have been satisfactorily completed within five years of the time the student wishes to enter the program.

Subject Area Semester Hours
English 6
Humanities and Social Sciences* 18
Physics 8
General Chemistry 8
Organic Chemistry 8
Biochemistry** 4
General Biology 8
Genetics 3
Cellular Biology*** 3
TOTAL 66

* May include, for example, courses in English literature, speech, music, art, philosophy, religion, language, history, economics, anthropology, political science, psychology, sociology, and geography.

** Exclusive of laboratory.

*** It is expected that this requirement will be fulfilled by a course in cellular or molecular biology.

Admission Procedures
Admission of new students is for the fall semester, with first priority given to residents of Tennessee. The College of Veterinary Medicine utilizes the Veterinary Medical College Application Service (VMCAS) for all applicants. Forms and instructions for making application for admission may be obtained beginning July 1, 1997 from the Office of the Associate Dean, The University of Tennessee, Knoxville. Pre-veterinary course requirements must be completed by the end of the spring term in the summer of the year in which the student intends to enroll. Biochemistry requirements must have been satisfactorily completed within five years of the time the student wishes to enter the program.

Provisional Admission
An applicant who holds a provisional B.S. degree and who meets all academic requirements for admission to the professional program of the College of Veterinary Medicine may be admitted conditionally. The applicant must then take the VMCAS and the Medical College Admission Test (MCAT) and obtain the required grades and scores for the program to be considered for full admission. Provisional students must apply for admission by June 1 for consideration for the following fall semester.

The final year of the professional curriculum begins immediately following the fall semester and is a continuous clinical rotation experience extending over one calendar year.

The first year consists mostly of the pre-clinical subjects of anatomy, physiology, histology, and microbiology. Also included in this first year are clinical subjects of physical diagnosis and anesthesiology. 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 rotate through a series of clinical blocks.

An innovative feature of this curriculum is the designation of semester six as one in which the individual student may select his or her courses of study. This allows select students who have specific educational goals (such as advanced or dual degree programs) to enroll in all, some, or none of the regularly scheduled courses during that semester. Students enrolled in the D.V.M. program are required to complete at least 16 credit hours in the sixth semester and may register for up to 10 credit hours of graduate courses without enrolling in The Graduate School and these hours will be credited toward the D.V.M. degree. This semester of elective study offers a unique educational alternative for select students in the CVM and is intended to enhance professional growth, concentration in an area of interest and career opportunities.

In addition to education in the science and art of veterinary medicine, students receive instruction in paramedical subjects such as animal behavior, medical communication, professional ethics, jurisprudence, economics, and practice management.

The curriculum requires successful completion of 152 semester credits.

THE GRADUATE PROGRAM

The Professional 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, Immunology, Virology and Immunology, Physiology, Animal Biotechnology, and Veterinary Pathology. Each department may offer its own Master of Science degree program. Some graduate faculty of the College of Veterinary Medicine are involved in the Comparative and Experimental Medicine program. This program provides a wide spectrum of interdisciplinary training that prepares graduates for teaching and/or research careers in the health sciences.

PROFESSIONAL COURSES

811 Bacteriology and Mycology (4) Fundamental aspects of microbiology and pathogenesis of bacterial and fungal diseases of animals: antimicrobial action and mechanisms of bacterial resistance. General approaches to diagnosis, treatment and prevention.

812 Virology and Immunology (5) Basic and clinical aspects of virus replication, virology and immunology. Considerations of disease and control of animal and human viruses.

821-22 Veterinary Anatomy I, II (7,7) Integrated approach to study of development, macroscopic (gross), and microscopic anatomy of common domestic animals. Disorders and diseases of the musculoskeletal, nervous, integumentary, respiratory, cardiovascular, and gastrointestinal systems.

823-24 Physiology I, II (4,4) Introduction to concepts and principles of physiology. Study of the systems and organ systems of domestic animals. Emphasis on function and function of the cardiovascular, nervous, endocrine, respiratory, integumentary, and gastrointestinal systems.

827 Special Problems in Animal Science (1-8) Extra-mural and specialty designed study for students interested in select topics in anatomy, physiology, and immunology.

830 Art of Veterinary Medicine (1) Paramedical subjects important to veterinary medicine: practice management, interpersonal relations, communications, jurisprudence, ethics, careers, animal behavior and veterinary history. May be repeated. S/NC only.

831 Physical Diagnosis (2) Basic care, feeding, restraint, and handling of normal and diseased animals. Introduction to physical examination and diagnosis of common clinical conditions.

832 Anesthesiology (2) Principles of anesthesiology: pharmacology of anesthetic agents, and introduction to anesthetic techniques in veterinary medicine.

833 Epidemiology (2) Determinants of health and productivity in groups of animals, and critical appraisal of clinical information.

834 Hematopoietic System (3) Pathophysiology, special pathology, and clinical management of diseases of the hematopoietic and lymphoid organs and tissues. Principles and methods of laboratory evaluation of diseases of other organ systems.


836 Toxicology (2) Principles of toxicology, molecular mechanisms, pathologic processes and clinical features of animal diseases to be taught.

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 the integumentary system. Laboratory examination, pathology, diagnosis and treatment.

841 Reproductive System (4) Pathophysiology, special pathology, medicine and surgery of diseases of the reproductive system. Laboratory examination, pathology, diagnosis and treatment.

842 Alimentary System (5) Pathophysiology, special pathology, medicine and surgery of diseases of alimentary systems.

843 Musculoskeletal System I (3) Pathophysiology, clinical description and basic treatment modalities of common diseases and conditions of skeletal system of small animals: development of basic diagnostic and treatment skills.
844 Musculoskeletal System II (3) Pathophysiology, special pathology, medicine and surgery of diseases of muscular and skeletal systems. Advanced principles, radiographic interpretation and surgical procedures.

845 Veterinary Nutrition (2) Principles of nutrition, and nutrition of animals in health and disease. Applied nutrition relating to individual small or large animal patient or herd situations.

846 Multispecies Medicine (4) Anatomy, pathophysiology, medicine, and surgery of avian species, laboratory and zoo animals and reptiles. Species and diseases seen by practicing veterinarian. Current topics on foreign animal diseases.

848 Art of Veterinary Medicine II (1) Paramedical subjects important to veterinary practice: practice management, interpersonal relations, communication, jurisprudence, ethics, careers, animal behavior and veterinary history. May be repeated. S/NC only.

850 Introduction to Clinics (1) Clinical veterinary practice with discussions and practical experience. Problem-solving and integration of basic sciences with clinical applications. Problem-oriented veterinary medical record.

851 Urinary System (3) Pathophysiology, special pathology, medicine and surgery of diseases of urinary system. Urinary system in health and disease.

852 Cardiovascular System (2) Pathophysiology, special pathology, medicine and surgery of diseases of cardiovascular system. Anatomic, physiologic and pharmacologic principles which provide basis for treatment.


854 Respiratory System (3) Pathophysiology, special pathology, medicine and surgery of diseases of respiratory system. Upper and lower respiratory system; infections 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 Clinical Rotation in Specialties (2) Clinical training in specialty services: anesthesiology, ophthalmology or dermatology. Direct responsibility for diagnosis, patient care, and treatment of clinical patients in both large animal and small animal clinical sciences.

859 Clinical Clerkship (2) Advanced clinical training in small animal and large animal clinical sciences, comparative medicine, and pathology. S/NC or letter grade.

860 Pharmacology (4) Principles of pharmacokinetics and pharmacodynamic properties of veterinary drugs: mode of action, pharmacologic effects, chemical and physical properties, metabolism, toxicities, important idiosyncrasies and clinical application.

861 Clinical Rotation in Comparative Medicine (2) Clinical training in avian medicine, laboratory animal and zoo animal medicine, epidemiology, public health, and other related disciplines.

862 Clinical Rotation 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.

863 Clinical Rotation in Radiology I (2) Clinical training and demonstrations in laboratory diagnosis: post-mortem examination and clinical pathologic, parasitologic and microbiologic techniques.

864 Clinical Rotation in Radiology II (2) Clinical training and demonstrations in laboratory diagnosis: post-mortem examination and clinical pathologic, parasitologic and microbiologic techniques.

865 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.

866 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.

867 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.

868 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.

869 Clinical Rotations in Small Animal Clinical Sciences IV (4) Clinical training in medicine, surgery and specialty disciplines for companion animals. Direct responsibility for diagnosis, care, and treatment of clinical patients.

870 Clinical Rotation in Pathology I (2) Clinical training and demonstrations in laboratory diagnosis: post-mortem examination and clinical pathologic, parasitologic and microbiologic techniques.

871 General Pathology (4) Principles of pathobiology: causes of disease, disturbances of cell growth, inflammation, and neoplasia.

872 Parasitology (3) Principles of parasitology: protozoology, helminthology, and entomology and relationship to diseases in animals.

873 Special Problems in Comparative Medicine (1-8) Extramural and specially designed study for students interested in select topics in small animal clinical sciences.

874 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.

875 Clinical Rotations in Pathology I (2) Clinical training and demonstrations in laboratory diagnosis: post-mortem examination and clinical pathologic, parasitologic and microbiologic techniques.

876 Clinical Rotations in Pathology II (2) Clinical training and demonstrations in laboratory diagnosis: post-mortem examination and clinical pathologic, parasitologic and microbiologic techniques.

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 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.

879 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.

880 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.

881 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.

882 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.

883 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.

884 Clinical Rotations in Small Animal Clinical Sciences IV (4) Clinical training in medicine, surgery, and specialty disciplines for companion animals. Direct responsibility for diagnosis, care, and treatment of clinical patients.

885 Clinical Rotation in Radiology I (2) Clinical training in radiographic techniques and interpretation of radiographs as part of diagnostic process.

886 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.

887 Clinical Rotations in Large Animal Clinical Sciences (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.

888 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.

889 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.

890 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.

891 Clinical Rotation in Radiology II (2) Clinical training in radiographic techniques and interpretation of radiographs as part of diagnostic process.

892 Clinical Rotation in Radiology III (2) Clinical training in radiographic techniques and interpretation of radiographs as part of diagnostic process.

893 Special Problems in Large Animal Clinical Sciences (1-8) Extramural and specially designed study for students interested in select topics in medicine, surgery, herd health, reproduction, radiology and medical specialties of large animals.

GRADUATE COURSES

536 Toxicology (2) Principles of toxicology, molecular mechanisms, pathologic processes and clinical features of animal diseases caused by common toxic agents. Prereq: Consent of instructor. (Same as Comparative and Experimental Medicine 536.) F
FACILITIES FOR RESEARCH AND SERVICE
Facilities for Research and Service

Bureau of Educational Research and Service
(College of Education)
Carol E. Kasworm, Director
Housed in the Associate Dean's Office for Research and Technology, the Bureau is responsible for the coordination of research activities and for the development of college research and service activities based on 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 and contract review, administration, and fiscal processes. The Bureau also provides the administrative home for the interdisciplinary Center for Literacy Studies, the Appalachian Rural Systemic Initiative Resource Collaborative, and the High School Equivalency Program (Migrant Education).

Center for Business and Economic Research
(College of Business Administration)
William Fox, Director
In its economic research endeavors, CBER today has the same basic mission determined at its inception 58 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, the Tennessee Statistical Abstract, the Center publishes research on a wide range of socioeconomic and policy issues, including taxes, banking, telecommunications, environmental concerns, and employment prospects.

While its core mission remains little changed, the scope of the CBER unit has expanded from a largely individualistic fiscal assistance program to a regional economic research, policy analysis, and communications technology arm of the College of Business Administration, with a staff of three senior research faculty and support staff in areas of research, information technology, and information dissemination, located at 100 Glocker.

Center for Information Studies
(School of Information Sciences)
The Center for Information Studies (CIS) was established in June 1989 to be a focal point for research related to information systems and services. The Center, located at 304 Temple Court, has performed research for the federal government, state and local governments, and business and industry. Projects have ranged from strategic planning efforts to information system and service evaluations, to modeling of scientific and technical communication. Staff of the Center have been actively involved in proposal development and project performance with faculty and staff in other centers and departments at the University.
Areas of interest to the Center include information systems design, information organization and retrieval in very large databases, directories and locator tools in a networked environment, design of regional library and information system networks, new technology applications, information system support for educational reform, modeling of information processes, development of measures and methods for evaluating information system performance and effectiveness.

Center for Literacy Studies
(College of Education)
The Center for Literacy Studies was founded in 1988. The Center's purpose is to bridge theory and practice in the field of adult learning and literacy. To achieve its purpose, the Center collaborates with practitioners, policy makers, and other research organizations on projects that address five common themes: 1) building the capacity for literacy delivery systems that can meet the needs of a changing society; 2) forming partnerships with practitioners who are working to make changes in their practice of adult education; 3) developing innovative approaches to adult learning and literacy; 4) developing innovative technology applications for the field; and 5) disseminating results to the field.

Center for Physical Activity and Health
(College of Education)
The mission of the Center for Physical Activity and Health is to integrate scientific research, education, and practical applications of exercise and health science in a manner that enhances health, fitness, performance, and quality of life. The Center is a service-oriented organization designed to educate the UTK and Knoxville communities about the benefits of regular physical activity. As well as work 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 UTK community, promoting exercise within the UTK and Knoxville communities, and providing exercise testing and assessment.
For additional information about services, contact Dixie L. Thompson at (423) 974-1271 or via e-mail at dixielee@utk.edu.
Center of Excellence for Materials Processing

The Center for Materials Processing is one of the "Centers of Excellence" created by the State of Tennessee. It has an interdisciplinary program designed to bring together individuals with appropriate expertise to solve important materials processing problems. It emphasizes (1) the development of desirable materials properties through the control of composition, molecular structure, and microstructure, (2) measurement of process variables, and (3) control of those variables to ensure proper processing. The Center conducts basic research and teaching in materials processing and carries out research to improve existing processing technologies and transfer of research results to industry. A major aspect of the Center is student participation in industry-sponsored research programs. The Center is located in 100 Estabrook Hall, 974-0816.

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 Knoxville 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:

Bermadette E. Schmitt Chair of Excellence in Human Development
Bernard Blasingame Chair of Excellence in Agricultural Policy
Clayton Homes Chair of Excellence in Computer Integrated Engineering and Manufacturing
Condra Chair of Excellence in Power Electronics Applications
Goodrich Chair of Excellence in Waste Management and Environmental Engineering
Hodges Chair of Excellence in English
J. Fred Holly Chair of Excellence in Political Economy

Nancy Gore Hunger Chair of Excellence in Environmental Studies
Pilot Chair of Excellence in Management
Ivan Racheff Chair of Excellence in Ornamental Horticulture
Ivan Racheff Chair of Excellence in Materials Science and Engineering
Forrest & Patsy Shumway Chair of Excellence in Romance Languages
UTK Willis Lincoln Chair of Excellence in Physics

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 Livestock Diseases and Human Health
Dr. G. M. H. Shires, Director
109 Morgan Hall
College of Veterinary Medicine
UT-Knoxville
Knoxville, TN 37996
(423) 974-7262

Center for Materials Processing
Dr. Carl McHargue, Director
121 Perkins Hall
Knoxville, TN 37996
(423) 974-7698

Science Alliance
Dr. Thomas A. Callcott, Director
UT Knoxville
101 South College
Knoxville, TN 37996
(423) 974-6765

Waste Management Research and Education Institute
Dr. Gary Sayler, Acting Director
Dr. Jack W. Barkenbus, Director of Operations
UT Conference Center, Suite 311
600 Henley St.
Knoxville, TN 37996-0710
(423) 974-4251

Child Development Laboratories

Anne Miller Stott, Staff Director
The Child Development Laboratories, operated by the Child and Family Studies Department within the College of Human Ecology since 1927, currently offer child care programs for young children ages six weeks to five years. The Child Development Laboratories serve three purposes: (1) to promote observation, participation, and research activities of the department and other university faculty and students; (2) to provide undergraduate and graduate child development professionals for work 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 a tele-telemetry laboratory that features unique videotaping capabilities in all classrooms, small group research rooms, and observation booths that facilitate teacher training 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.

Child Development Laboratories are accredited by the Tennessee Higher Education Commission. The programs are equipped with a tele-telemetry laboratory that features unique videotaping capabilities in all classrooms, small group research rooms, and observation booths that facilitate teacher training 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://funnelweb.utcc.utk.edu/~utkcdl.

Communications Research Center

The Communications Research Center, 426 Communications Bldg., is an adjunct to the communications graduate program. Objectives of the Center are: (1) to conduct original research in mass and public communication; (2) to disseminate research-generated information; and (3) to provide research services to faculty and students, professional communicators, and others interested in improving the quality of human communications.

Division of Information Infrastructure

Susan Mettlen, Vice Chancellor

The UT Division of Information Infrastructure (DII) provides computing and telecommunications resources and services for students, faculty and staff on the Knoxville campus. DII consists of three operating units: Innovative Technologies, Computing and Academic Services, and Telecommunications and Network Services. Information about DII is available on the web site http://www.utk.edu/computing.

INNOVATIVE TECHNOLOGIES

Susan Metros, Acting Director

The Innovative Technologies Center (ITC) maintains a multi-platform development laboratory equipped with updated peripherals, software and resources for designing, developing, authoring, producing and evaluating on-line courseware and multimedia prototypes. The ITC staff is engaged in research and development of advanced instructional technologies, and provides a variety of workshops and presentations for the teaching staff during the annual academic year.

ITC staff supports faculty and graduate teaching assistants in the integration of appropriate technology into the instructional program. The services provided by ITC enable faculty to significantly enhance the effective-
ness of the educational process and enrich the learning experience of students.

The Data Visualization Laboratory is a component of Innovative Technologies with responsibility for implementing a state-of-the-art, distributed visualization system to enhance teaching and research at UT and provide a model for the utilization of this technology. The ITC staff maintains their own web site at http://www.it.utk.edu, as well as the University of Tennessee Knoxville's web site at http://www.utk.edu.

COMPUTING AND ACADEMIC SERVICES
Dewitt Latimer, Director
Computing and Academic Services (CAS), provides computing facilities and services for the university's teaching, research, public service, and administrative activities. Information and assistance in accessing all services may be obtained at the Aconda Court Service Center, Room 104, or by calling the Support Line at 974-9900. Both facilities are open on weekdays from 9 AM to 4 PM. Information and documentation is also available at the CAS web site http://www.cas.utk.edu.

CAS provides an individual UNIX account for all UT Knoxville students, faculty and staff members for purposes of their affiliation with UT. The UNIX account may be utilized for e-mail, course work, research, personal Web home pages, etc.

CAS publishes "The Life Preserver," which is an introduction to computing and networking at UT and provides orientation courses, classes in using Microsoft Office products and using the Internet. CAS also provides over 250 self-paced, computer-based training courses on computing and network topics. Some of the CBT course topics include Microsoft Word, Excel, Access, Powerpoint, Lotus Notes, Novell, UNIX, Win95, Internet, HTML, and Java.

CAS maintains 6 staffed computing labs and 15 unstaffed labs, and supports computing installations in all residence halls. The computing labs are equipped with more than 200 microcomputers and 8 workstations including current models of Apple, IBM, Sun, Dell, and Gateway machines. In addition, there are laser printers, scanners and zip drives available. A variety of industry standard software applications are available for use on the machines in the computing laboratories.

CAS provides statistical consulting to help students, faculty and staff to enhance the quality of their research by effectively applying statistical methodology. For more information about the Statistical Consulting Center, call the DII Computing Support Line at 974-9900 and ask to speak to a statistical consultant.

CAS coordinates computing resources for research activities on the Knoxville campus. A 34 node (32 thin, 2 high) IBM SP2 parallel architecture machine was acquired in 1997 and is available for high performance research computing needs.

CAS operates central UNIX machines which serve a variety of functions; mail server, file server, user logins, etc. Equipment includes three Sun Enterprise 450, 1 SUN Enterprise 3000, 2 Sun Enterprise 1000, 9 Sun Sparc 20, 1 Sun Ultra 1, 2 Sun Ultra 2, 1 SGI Challenge L, 1 IBM RS6000 R20. An IBM 6972-R42 operates under VM/ESA with MVS/ESA-EJS-ES2 and VM/HPO guests. Software available on the central servers at CAS includes commonly used compilers and interpreters, and a large number of programs for statistical, mathematical, engineering, operations research, and graphics applications.

CAS participates in educational programs sponsored by IBM, Lotus, Microsoft, SGI, and Sun that provide software packages at reduced or no cost to the University of Tennessee. Individual copies of Microsoft products, including Windows and Office 97, are available to students at a substantially reduced cost. CAS also provides user access to a variety of public domain software for microcomputers and maintains software site licenses for a variety of workstation and microcomputer software.

TELECOMMUNICATIONS AND NETWORK SERVICES
Joe Gibson, Acting Director
Network Services provides network connectivity throughout the UT campus, data communications between the UT campuses, and connectivity to the Internet. The UT network consists of approximately 10,000 nodes, and network connectivity is available in all campus residence halls. Network Services also provides dial-up access to the campus network via a 600-modem dial-up pool, which supports PPP to allow users to connect to the Internet as well as to store servers on campus, and digital connections via ISDN.

Network Services participates in national networking initiatives, including Internet2 (I2), NSF'S very high speed Backbone Network Service (BNVS), the federal Next Generation Internet (NGI) initiative, and maintains a Sunsite center for Java information and software distribution for networking learning environments. Further information may be obtained from the network services web page at http://www.ns.utk.edu.

Telephone Services operates a Private Branch Exchange, with 15,000 ports, which processes approximately 1.8 million telephone calls per week during each academic year. A copper backbone of approximately 25,000 circuits supports alarm, signaling, voice, and low-speed data services. Local and long-distance telephone service is extended to residents of residence halls and rental properties through The Volunteer Connection. Customer Service Representatives assist customers in systems design, deployment, and use of supported equipment.

Energy, Environment, and Resources Center
(Office of Vice Chancellor for Research)
Jack N. Barkenbus, Executive Director
The Energy, Environment, and Resources Center, 500 Henley Street, Suite 311, was created in 1973 to encourage interdisciplinary research directed at solutions to problems related to energy and the environment. The Center involves faculty and students in research and public service projects that involve several disciplines, and assists government and industry in specific problems related to energy, environmental, resource, and technology policy issues. The Center has a close working relationship with the Joint Institute for Energy and Environment, and Oak Ridge organizations. Sponsors include federal and state agencies, industry, and foundations.

Current research includes solid and hazardous waste management, information systems, environmental education, global environmental problems, and pollution prevention. The Center operates the Waste Management Research and Education Institute, the Center for Clean Products and Clean Technologies, the Water Resource Research Center, the Center for Geography and Environmental Education, and the System Development Institute. Current grants and contracts are approximately nine million dollars per year.

English Language Institute
Dale A. Myers, Director
The English Language Institute (ELI) is a non-credit language-study program of The University of Tennessee, Knoxville. It is designed to assist students in their pursuit of career goals or educational objectives in the U.S.

The ELI offers intensive courses for the improvement of student skills in the English language. International students, visitors and professionals have successfully learned English through study in the ELI.

The courses emphasize the development of communicative ability in listening, speaking, reading, and writing. Faculty members are trained in teaching English to speakers of other languages with differing national backgrounds and varying proficiency in English. Classes also assist students in pronunciation, test-taking strategies, U.S. culture orientation, and university study skills.

Additional information may be obtained at 907 Mountcastle St., (423) 974-3404; Fax (423) 974-9383.

Institute for Tourism and Leisure Industries
(College of Human Ecology)
Ken Krick, Director
The mission of the Institute is to serve as a catalyst for enhancing economic development in East Tennessee by supporting existing, as well as encouraging the creation of new, sustainable tourism and leisure industries. The Institute serves as a center of expertise for providing technical assistance, for conducting feasibility studies and other research, for structuring and delivering training programs, and for providing the critical linkage between human and capital resources necessary for developing new businesses.

The Institute actively collaborates with and actively supports the efforts of many special interest groups throughout East Tennessee. As such, the Institute is in a position to interface groups primarily interested in tourism with groups representing leisure industries and the economy as a whole. Hence, the Institute attempts to build a win-win philosophy among the major components of the leisure economy in East Tennessee.
The Institute of Agriculture traces its history to 1869 when the University was designated as Tennessee's Federal Land-Grant Institution. Under terms of the Federal Land-Grant Act, the University was enabled to offer instruction in agriculture and the mechanic arts for the first time. Since 1869, agricultural programs at the University have been expanded to include research for the development of new knowledge and extension for dissemination of such knowledge to rural people. Thus the Institute of Agriculture has come to include the work of four main divisions: Agricultural Experiment Station, Agricultural Extension Service, College of Agricultural Sciences and Natural Resources, and College of Veterinary Medicine.

Agricultural Experiment Station

Don O. Richardson, Dean
John I. Sewell, Associate Dean
Thomas H. Klindt, Associate Dean

The Agricultural Experiment Station was established by The University’s Board of Trustees on June 8, 1882, five years before the passage of the Hatch Experiment Station Act by the U.S. Congress. The University was one of the first five institutions in the U.S. to establish an Agricultural Experiment Station. Since its beginning, the Station has given first attention to investigations of concern to the agriculture of Tennessee.

The objectives of the Tennessee Agricultural Experiment Station are the creation and utilization of new knowledge through research. Fundamental research is directed toward: (a) Understanding the basic science of the processes of plant and animal production through conversion into usable products and services; (b) Understanding the resource and market forces which affect the production, transfer, processing, and utilization of agricultural commodities and the resulting impact on the economic well-being of the agricultural sector, rural areas, and the State of Tennessee; (c) Understanding the interaction of agricultural production and land uses on natural resources and the environment as they relate to long-term productivity and affect the quality of rural life; (d) Understanding the impact of food and fiber resources and the chemicals used in their production on people’s well-being and the quality of life. Applied research utilizes those understandings to formulate effective production and marketing systems and to foster the development of a physical and economic environment that provides for the needs of rural, farm, and urban citizens.

The investigations of the Station follow a systematic method of gaining and applying knowledge efficiently to the biological, physical, and economic phases of producing, processing, and distributing farm and forest products; to the social and economic aspects of rural living; and to consumer health and nutrition. Both farm and urban populations gain from the accomplishments of the Agricultural Experiment Station. Examples of some of these accomplishments are new and improved varieties of crops, new and better methods of controlling crop and livestock pests, more efficient production of crops and pasture through improved fertilization and mechanization, and more efficient feeding and management of livestock.

The program is designed and administered through ten subject matter departments located at Knoxville. A majority of the faculty have teaching responsibilities in addition to their research. To assist in the research program, the Station supports over 100 graduate students. To serve Tennessee’s diverse agriculture, branch stations are operated at Crossville, Grand Junction, Greeneville, Jackson, Knoxville, Lewisburg, Milan, Oak Ridge (forestry), Springfield and Spring Hill. Professional and technical staff are in residence at these locations.

Agricultural Extension Service

Billy G. Hicks, Dean
Mildred F. Clarke, Associate Dean
D. Ray Humberd, Assistant Dean

The Agricultural Extension Service was established in 1914. Its purpose is to extend through various educational means agricultural and home economics information to farm families and others in the state who do not have the opportunity to enroll in resident courses of instruction at colleges.

The educational program is carried on through offices in each of the 95 counties of the state. Educational emphasis includes work in four major program areas: agriculture and natural resources, community resource development, home economics, and education of young people through 4-H Clubs. County Extension staff members working directly with local people are supported in the various information fields by a specialist staff, members of which are stationed either in Knoxville, Nashville, or Jackson.

The Agricultural Extension Service operates administratively as one of four units of the Institute of Agriculture. For administration, the state is divided into five districts with supervisors located in their respective districts. District headquarters are maintained in Knoxville, Chattanooga, Cookeville, Nashville, and Jackson.

The Agricultural Extension Service operates as a three-way partnership among county, state, and federal governments. The University of Tennessee represents state and federal government and a County Agricultural Extension Committee represents county government in this partnership.

Libraries, The University of Tennessee, Knoxville

Paula T. Kaufman, Dean
Aubrey H. Mitchell, Associate Dean

Professors:
Bayne, Pauline S., M.S.L.S.--------North Carolina
Felder-Hoehne, Felicia H., M.S.L.S.--------Atlanta
Grady, Agnes M., M.A., M.L.--------Washington
Kaufman, Paula T., M.B.A., M.S.--------Columbia
Lloyd, James B., M.A., M.L.S., Ph.D.--------Mississippi
Phillips, Linda L., M.L.S.--------Rutgers
Rader, Joe C., M.L.S.--------Tennessee
Webster, Judith D., M.S.L.S.--------Tennessee

Associate Professors:
Baker, Gayle D., M.S., M.L.S.--------Alabama
Bridges, Anne E., M.A., M.L.S.--------Rhode Island
Bratten, William A., M.S.L.S.--------Clarion
Clement, Russell T., M.A., M.L.S.--------Brigham Young
Crowther, Carmen N., M.A., M.Ln.--------Emory
Dixon, Lana A., M.S.L.S.--------Tennessee
Garrett, Marie A., M.A., M.L.S.--------Vanderbilt
Harwood, Richard M., M.L.S.--------North Texas
Keally, Jillian M., M.S.L.S.--------Indiana
Leach, Sandra S., M.A., M.Ln.--------Emory
Mack, Thora, M.S.L.S.--------Tennessee
Miller, Tamara J., M.S.L.S.--------Kentucky
Minton, James O., M.S., M.L.S.--------Tennessee
Mitchell, Aubrey H., M.S.L.S.--------Tennessee
Ponnappa, Biddanda P., M.S.L.S.--------Tennessee
Prescod, Janette, M.S.L.S.--------Western Michigan
Row, Jane S., M.S., M.L.S.--------Tennessee
Sammataro, Linda, M.L.S.--------Southern Connecticut State
Smith, Rita H., M.S.L.S.--------Illinois
Thompson-Wise, Deborah A., M.Ln.--------South Carolina
Wallace, Alan, M.Ln.--------Washington

Assistant Professors:
Atkins, David P., M.A., M.L.S.--------Wisconsin
Ellis, Kathryn D., M.S.L.S.--------North Carolina
Hammons, James W., M.L.S.--------Indiana
Johnson, Kay G., M.S.L.S.--------North Carolina
Lahmorn, JoAnn, M.S.L.S., Ph.D.--------Florida State
Robertson, Michelle, M.S.L.S.--------North Carolina
Shrodle, Flora G., M.L.I.S.--------Texas
Thomas, Deborah L., M.B.A., M.L.S.--------George Peabody
Thomas, Steve, M.S.L.S.--------Tennessee
Viera, Ann R., M.L.I.S.--------California, Berkeley
Wise, Flossie, M.L.S.--------Tennessee

The University of Tennessee Libraries' own approximately 2 million volumes and subscribe to more than 10,000 periodicals and other serial titles. The Libraries' membership in the Association of Research Libraries reflects the University’s emphasis on graduate instruction and research and the support of large, comprehensive collections of library materials on a permanent basis.

The UT, Knoxville Libraries consists of the main library (the John C. Hodges Library), four branches on the Knoxville campus (the Agriculture-Veterinary Medicine Library, the Map Library, the Music Library, and University Archives & Special Collections), and the Social Work Library in Nashville.

Research assistance is available at the reference desk in each library. Free self-searching of selected databases is also available in the reference area and remotely, through the World Wide Web.

Search the catalog of holdings at any library branch or via the UT Libraries’ Web site at www.lib.utk.edu. Materials that are not...
available in the UTK Libraries can be requested through Interlibrary Services. The services and facilities of the University Libraries are accessible to persons with disabilities. Adaptive equipment such as a Kurzweil Reading Pen and TDD are available at the Hodges Library.

The John C. Hodges Main Library (1015 Volunteer Blvd.) is a 350,000 square-foot facility housing collections in all subject areas. The Hodges Library has approximately 300 graduate student carrels, 200 faculty studies, and comfortable study space for more than 2,000 people.

The Agriculture-Veterinary Medicine Library (Room A-113, Veterinary Teaching Hospital) has a strong collection in agriculture; veterinary; comparative and human medicine; and related biological sciences. Most of the publications of the U.S. Department of Agriculture and the State Agricultural Experiment Stations and Extension Services are collected.

The Map Library (Room 15, basement of the Hoskins Library, Cumberland Ave. & 15th St.) maintains and develops a collection of sheet maps, atlases, journals, and books related to cartography. Materials in print, film, and digital formats are acquired from commercial sources as well as the Government Depository program.

The Music Library (301 Music Bldg.) has a comprehensive collection of music and music literature, including books, scores, audio and video recordings, current periodicals, and microfilm. All materials in the Library of Congress "M" classification are located here.

Special Collections (2nd floor, west wing, of the Hodges Library) is a repository of primary source materials and costly modern library materials. The University Archives contains official records of the University; items published officially and unofficially; and other materials that document University of Tennessee life. Materials from Archives and Special Collections are made available to patrons from closed stacks for use in the Reading Room.

The Social Work Library (1720 West End Ave., Nashville) serves College of Social Work students in field practices across the state. The library has a working collection of materials in social work and related disciplines.

The Law Library on the Knoxville campus and the libraries located on the campuses in Chattanooga, Martin, Memphis, and Tullahoma are individually administered. Each library at the University of Tennessee is accessible to all students and faculty in the system.

Data excludes Law Library faculty and statistics.

### Management Development Center

(College of Business Administration)

John E. Riblett, Director

The College of Business Administration's executive/management education efforts are facilitated through the Management Development Center, 708 Stokely Management Center.

The mission of the Center is to promote the learning and dissemination of an integrated framework of managerial excellence. The Center defines excellence in terms of competitive world standards of quality, efficiency, and service to the recognized concerns of all constituencies (customers, employees, suppliers, owners, students, and society in general). The Center includes the following responsibilities: (1) developing close strategic partnerships with a selected set of companies to facilitate learning and development of the knowledge which is truly externally valued, and (2) acting as a facilitator in driving this knowledge into the credit curriculum of the College.

The Center prides itself on the development of long-term relationships with organizations that provide a living laboratory to test and validate the new knowledge of the Center that is disseminated in a variety of formats. Executive and Management Education Programs are one form of dissemination. The Center has provided custom and public programs for 80 of the Fortune 1000 companies.

The Center emphasizes consistent, high-quality programming, small class sizes, and an outstanding faculty who bring the added value of experience in the private and public sectors to the classroom, a highly interactive style of instruction, and an applied orientation. The focus is on longer time, more developmentally oriented programs of one to four weeks in length such as the four-week University of Tennessee Executive Program and one-week Senior Executive Institute for Productivity Through Quality.

### Measurement and Control Engineering Center

(College of Engineering)

Arlene Garrison, Director

The Measurement and Control Engineering Center, 102 Estabrook Hall, is sponsored by the College of Engineering, the Oak Ridge National Laboratory, and the National Science Foundation. The Center's Program combines education, research, and technology transfer. Graduate assistantships are available for qualified students. The research is funded by major U.S. industrial companies and focuses on theoretical and practical developments in measurement and control, concentrating on areas that will significantly improve the productivity, reliability, and safety of industrial systems and processes.

Center sponsored research is carried out in the fields of process control, signal and image processing, and sensor development. Research in process control concentrates in the areas of process analysis, process modeling, control system design, and real-time expert systems. Fiber optic sensor systems development is underway for monitoring and control of chemical processes.

### Nutrition Institute

(College of Human Ecology)

Michael B. Zemel, Director

Thomas C. Namey, Associate Director

The Nutrition Institute is a system wide, multidisciplinary consortium of faculty who are engaged in clinical and experimental nutrition research, teaching and service. Its expertise and resources are multifaceted including tools and techniques used in cell biology, epidemiology, metabolism and clinical training.

The multidisciplinary nature of nutrition has created a situation where nutrition research and teaching is dispersed among a number of academic units, including the Department of Nutrition in the College of Human Ecology as well as in several departments in the colleges of Agricultural Sciences and Natural Resources, Arts and Sciences, Medicine, and Veterinary Medicine. The Institute provides a communication link among all efforts in nutrition sciences, coordinates collaborative research programs in nutrition and provides a unified forum for exchange and interactions with the national and international nutrition community. In addition, by creating formal ties among the units within the University that are involved in undergraduate, graduate and professional education in nutrition, teaching resources may be pooled to strengthen nutrition-related instruction in these units.

The Institute publishes an on-line magazine Nutrition Uncovered which addresses current issues and controversies in the field. It may be found on the Web at http://nutrinst.he.utk.edu.
Off-Campus Graduate Centers

KINGSPORT GRADUATE PROGRAM

UT Knoxville offers at Kingsport graduate programs in engineering and Human Resource Development at the master's level.

Students who enroll in these programs must be admitted to The Graduate School of UT Knoxville. Information and application forms may be obtained from the ETSU/UT at Kingsport, 1501 University Boulevard, Kingsport, Tennessee 37660.

OAK RIDGE GRADUATE PROGRAM

UT Knoxville offers graduate programs at Oak Ridge leading to the master's degree in several engineering and related technical areas. The ORGP operation is supported by a contractual agreement with DOE. Students can earn a master's degree in Chemical Engineering, Environmental Engineering (concentrations in mixed waste management, environmental risk assessment), Industrial Engineering (engineering management or traditional industrial engineering concentrations), Nuclear Engineering (radiological engineering concentration), or Safety Education. The MBA degree program is also available in a partnership program with UT-Martin.

Students who enroll in these programs must be admitted to The Graduate School at UT Knoxville. Information and application forms may be obtained from the UT-Oak Ridge Graduate Program, Post Office Box 117, TMSD Lab Road, Oak Ridge, Tennessee 37831-0117, http://www.acad.utk.edu/evening/orgp.htm.

CHATTANOOGA EDUCATION PROGRAM

UT Knoxville 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 The Graduate School of UT Knoxville. Information and application forms may be obtained from the UTK/UTC Graduate Center, UTC, 120 Race Hall, Chattanooga, Tennessee 37403.

THE UNIVERSITY OF TENNESSEE-OAK RIDGE GRADUATE SCHOOL OF BIOMEDICAL SCIENCES

UT Knoxville offers a program leading to the Ph.D. degree with a major in Biomedical Sciences. Graduate students have the opportunity to study and do research in conjunction with the Oak Ridge National Laboratory.

For complete information concerning the programs, see Biomedical Sciences under Fields of Instruction.

COLLEGE OF SOCIAL WORK

UT Knoxville 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 Knoxville 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.

Psychological Clinic

(College of Liberal Arts)

Leonard Handler, Director

The Psychological Clinic supports graduate research and training in clinical psychology. Psychological assessment and psychotherapy are offered on an outpatient basis to the general public as well as to University students and staff.

Research Consortiums

The University of Tennessee is a member of three not-for-profit research consortiums: Oak Ridge Associated Universities (ORAU); Southeastern Universities Research Association (SURA); and Universities Research Association, Inc. (URA).

1. ORAU is a nonprofit consortium of colleges and universities and a management operating contractor for the U.S. Department of Energy (DOE) located in Oak Ridge, Tennessee. ORAU works with its member institutions to help their students and faculty gain access to federal research facilities throughout the country; to keep its members informed about opportunities for fellowship, scholarship, and research appointments; and to organize research alliances among its members.

2. SURA is a nonprofit consortium of 41 universities in the Southeastern United States and Canada; and ORNL Research and ORAU Council member at 423-974-3466 or mdevine@utk.edu; or contact Monnie E. Champion, ORAU Corporate Secretary 223-866-3306. Additional information may also be found on World Wide Web sites at http://www.sura.org and http://cbef.gov/sura.

Textiles and Nonwovens Development Center

(College of Human Ecology)

Larry C. Wadsworth, Director of Marketing and Technology

The Textiles and Nonwovens Development Center (TANDEC) was opened in October 1990. TANDEC was made possible through a grant from Exxon Chemical Company. Nonwovens products loom large in a number of markets and TANDEC looms large in both basic research and nonwoven product development. Nonwoven research programs at UT Knoxville include structure-property-process relationships in melt blowing polycyline, polyesters, nylon, elastomeric polymer, engineering thermoplastics and recycled plastics; mechanism of melt blown web formation; modeling of the 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.

The primary missions of TANDEC are to conduct nonwoven and textile grant research programs and to develop new product applications. The TANDEC facilities further promote collaborations between individual university investigators and ORNL researchers. The SURA Continuous Electron Beam Accelerator Facility (CEBAF) Graduate Fellowship Program offers awards to promising graduate students enrolled or enrolling in master's or doctoral programs at SURA member institutions and whose research interests correspond to research activities to be conducted at CEBAF (i.e. nuclear and related particle physics, accelerator physics, and associated scientific and engineering fields).

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. Michael D. Devine, Vice Chancellor for Research and ORAU Council member at 423-974-3466 or mdevine@utk.edu; or contact Monnie E. Champion, ORAU Corporate Secretary at 423-866-3306. Additional information may also be found on World Wide Web sites at http://www.sura.org and http://cbef.gov/sura.
TRANSPORTATION CENTER

(Office of Vice Chancellor for Research)

Stephen H. Richards, Executive Director

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 the Vice Chancellor for Research at UT Knoxville. The Center’s multidisciplinary staff includes over 100 full-time researchers and technicians augmented with numerous faculty and students. The Center is presently organized into four major divisions: Logistics and Systems Analysis; Infrastructure and Environment; Safety and Traffic Operations; and Mobility Services and Policy.

The Center has three goals. The first is to conduct a program of research in transportation that is recognized for its excellence, comprehensiveness, innovation, productivity, and national leadership. The second is to develop and 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.

UNIVERSITY EVENING SCHOOL

(Office of Vice Chancellor for Academic Affairs)

Dr. John Muldowny, Associate Dean of Undergraduate Academic Affairs and Director of Summer, Evening and Special Programs

The University Evening School, in conjunction with academic colleges and departments, administers credit programs for those students attending classes on and off campus in a variety of nontraditional formats. Support services are provided to assist students in their educational pursuits.

ON-CAMPUS EVENING PROGRAM

Classes are offered during late afternoon and evening hours for those students who work or have other commitments during the day. The College of Communications offers the M.S. degree program in the evening. The School of Information Sciences offers the M.S. degree program which can be completed by attending evenings and summer session. The College of Arts and Sciences offers the Master's program in Public Administration. The College of Human Ecology offers the M.S. degree program in Retail and Consumer Sciences. Some departments within the Colleges of Agricultural Sciences and Natural Resources, Business Administration, Education, and Engineering offer courses required for an advanced degree during the evening. For a specific major, consult the appropriate department.

MINI-TERM

The University Evening School offers a Mini-Term during May. Students may enroll in one concentrated credit course during the Mini-Term period.

Courses and instructors listed for the Mini-Term are carefully selected to reflect a broad academic base of individualized offerings suited to an intensive program of study. Courses cover material and information included in regular semester offerings.

OFF CAMPUS PROGRAMS

The Evening School makes arrangements for departments to conduct undergraduate and graduate courses in a number of locations away from the Knoxville campus. The courses are scheduled in response to requests and identifiable needs of adult part-time students who live some distance from the UT Knoxville location. All course offerings and instructors are approved by the appropriate academic departments, and the credit awarded is resident credit.

The following graduate programs are available: Master of Arts with a major in Human Resource Development in Nashville, and in Memphis for vocational certification only; Master of Science with a major in Speech Pathology in Chattanooga and Tullahoma (State Department of Education contract program).

The Evening School administers an off-campus center at Oak Ridge where courses leading to advanced degrees in science and engineering are offered (see listing under Off-Campus Graduate Centers).

WORKSHOPS

Credit workshops are coordinated through various academic departments of the University and give students the opportunity to participate in short periods of intensive study. Workshops offer flexibility of timing, location, and content. Summer workshops are particularly popular with teachers and school administrators. Although most workshops are held on the UT Knoxville campus, geography is not a limiting factor.

STUDENT SERVICES

A comprehensive program of services including academic advising and financial aid information is provided by the University Evening School for both on and off campus students.

REGISTRATION

Priority registration by touchtone phone, mail, FAX, or regular phone is offered as a convenience to current Evening School students. Final registration at both on and off campus locations is available by phone or in person.

FEE WAIVER PROGRAM FOR SENIOR AND/OR DISABLED CITIZENS

The Evening School administers this state legislated program for UT senior or totally disabled Tennessee citizens who wish to take UT credit courses at a reduced rate. Specific information about the program may be obtained in the Evening School office.

For information, contact UT Evening School, 451 Communications Bldg, University of Tennessee, Knoxville, TN 37996-0341, or telephone (423) 974-5361 or 1-800-576-6557, FAX (423) 974-2027; email: uteveningschool@gateway.oe.utk.edu; Website: http://www.acad.utk.edu/evening.

University of Tennessee Space Institute

(Office of Vice Chancellor for Research)

T. Dwayne McCay, Vice President

The Space Institute is a graduate education and research institution located on a 365 acre lakeshore campus in Middle Tennessee. UTSI was established in 1964, and has evolved into an internationally recognized institution for graduate study and research in engineering, physics, mathematics, and computer science. The accredited academic programs and educational policies of the Space Institute have their origins in appropriate departments of The University of Tennessee, Knoxville. The more than 40 faculty members of the Institute carry out these accredited academic programs through classroom teaching, informal seminars, active research, and directing the research of their students in an environment of creative work and advanced study. Programs are available to students devoting full-time or part-time effort toward M.S. and Ph.D. degrees, those interested in continuing education for updating and broadening knowledge, and those who wish to pursue post-doctoral research.

Graduate degree programs are available with majors in Aerospace Engineering, Aviation Systems, Chemical Engineering, Computer Science, Electrical Engineering, Engineering Science, Industrial Engineering (engineering management concentration), Mathematics, Mechanical Engineering, Metallurgical Engineering, and Physics. In addition to the fundamental studies characteristic of each discipline, research opportunities are available in many areas including aerodynamics, fluid mechanics, advanced space propulsion, neural networks, energy conversion processes, superconducting materials, 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 Amos
Water Resources Research Center
(Office of Vice Chancellor for Research)
Timothy R. Gangaware, Associate Director
The Water Resources Research Center, 600 Henley Street, Suite 311, is a federally designated institute for sponsoring and coordinating water research for the state. The purposes of the Center are: (1) to assist and support all the academic institutions of the state, public and private, in pursuing water resources research which addresses a wide range of problems of interest to the state, region, and nation; (2) to provide for information dissemination and technology transfer services to state and local government bodies, academic institutions, professional groups, environmental organizations, and others, including the general public, who have an interest in water resources matters; (3) to promote education and training in fields relating to water resources and to encourage the entry of promising students into careers in these fields. The Center maintains a technical library which includes numerous water resources-related databases on CD-ROM.
A
Academic Calendar, 4
Academic Common Market, 14, 29, 48, 55, 57, 59, 61, 63, 64, 68, 76, 77, 81, 82, 85, 94, 106, 107, 110, 113, 117, 121, 125, 138, 144, 154, 156, 158, 161, 172, 175, 178
Academic Honesty, 19
Academic Probation, 19
Academic Standards, 19
Accounting, 47, 71
Accounting and Business Law, 40, 47
Activity Fee, 27
Adding Courses, 18
Administration, Graduate School, 6
Administration, University, 5
Administration, UT, Knoxville, 5
Admission Classifications, 15
Non-Degree, 15
Transient, 15
Admission Examinations, 15
Admission of Faculty and Staff Members, 16
Admission of International Students, 16
Admission Procedures, 15-16
Admission Requirements, 15-16
Admission to Candidacy, 21, 22, 23, 24, 25
Adult Education, 94, 166
Advertising, 41, 48
Advisor, 17
Advocacy and Dispute Resolution, 129
Aerospace Engineering, 142
African and African-American Studies, 126
Agricultural and Biosystems Engineering, 39, 49
Agricultural and Extension Education, 39, 49
Agricultural Economics, 51
Agricultural Economics and Rural Sociology, 39, 51
Agriculture Education, 49
Agricultural Experiment Station, 190
Agricultural Extension Service, 190
Agricultural Sciences and Natural Resources, College of, 39
Agricultural and Biosystems Engineering, 39, 49
Agricultural and Extension Education, 39, 49
Agricultural Economics and Rural Sociology, 39, 51
Animal Science, 39, 53
Entomology and Plant Pathology, 39, 102
Food Science and Technology, 39, 104
Forestry, Wildlife and Fisheries, 39, 105
Ornamental Horticulture and Landscape Design, 39, 156
Plant and Soil Sciences, 39, 162
Agriculture, 52
Agriculture Campus Map, 200
Agriculture, Institute of, 190
Agricultural Experiment Station, 190
Agricultural Extension Service, 190
College of Agricultural Sciences and Natural Resources, 39
College of Veterinary Medicine, 43
American Studies, 126
Ancient Mediterranean Civilizations, 126
Animal Science, 39, 53
Animal Science-Veterinary Medicine, 43, 54
Anthropology, 40, 54
Arts and Sciences, College of, 40
Anthropology, 40, 54
Art, 40, 58
Art Ceramics, 59
Art Design/Graphic, 59
Art Drawing, 59
Art Education, 83, 128
Art History, 59
Art Media Arts, 60
Art Painting, 60
Art Printmaking, 60
Art Sculpture, 60
Arts and Sciences, College of, 40
Architectural and Planning, College of, 39
Architecture, 39, 56
Planning, 39, 160
Architecture, School of, 39, 56
Index
Arrowmont, 61
Art, 40, 58
Art Ceramics, 59
Art Design/Graphic, 59
Art Drawing, 59
Art Education, 83, 128
Art History, 59
Art Media Arts, 60
Art Painting, 60
Art Printmaking, 60
Art Sculpture, 60
Arts and Sciences, College of, 40
Anthropology, 40, 54
Art, 40, 58
Audiology and Speech Pathology, 40, 61
Biochemistry and Cellular and Molecular Biology, 40, 64
Botany, 40, 66
Chemistry, 40, 74
Classics, 40, 79
Computer Science, 40, 83
Ecology and Evolutionary Biology, 40, 89
English, 40, 90
Geography, 40, 107
Geological Sciences, 40, 108
Germanic, Slavic and Asian Languages, 40, 110
History, 40, 114
Interdisciplinary Programs, 126
Life Sciences, 40, 134
Mathematics, 40, 139
Microbiology, 40, 147
Music, 40, 148
Philosophy, 40, 157
Physics and Astronomy, 40, 158
Political Science, 40, 163
Psychology, 40, 167
Religious Studies, 40, 170
Romance Languages, 40, 171
Sociology, 40, 177
Theatre, 40, 181
Asian Languages, 110
Asian Studies, 126
Assistantships, i, 29
Assistantships, Policy for the Administration of, 31
Astronomy, 158
Audiology, 61
Audiology and Speech Pathology, 40, 61
Auditors and Audited Courses, 17, 28
Automobile Registration, 35
Average, Required, 19
Aviation Systems, 63
B
Biochemistry and Cellular and Molecular Biology, 40, 64
Biomedical Sciences, 65, 192
Biosystems Engineering, 49
Biosystems Engineering Technology, 49
Biotechnology, 134
Black Cultural Center, 33
Board of Trustees, 5
Botany, 40, 66
Broadcasting, 41, 67
Bureau of Educational Research and Service, 48
Change (Revision) of Program, 16
Change of Registration, 18
Chemical Engineering, 42, 73
Chemistry, 40, 74
Child and Family Studies, 42, 75
Child Behavior Institute, 40
Child Care, 34
Child Development Laboratories, 42, 188
Civil Engineering, 77
Civil and Environmental Engineering, 42, 77
Civil Engineering, 77
Classics, 40, 79
Classifications
Admission, 15
Residency, 25
Classified Research, 21
Clinical Psychology, 167
Cognitive, Definition of, 20
College Student Personnel, 92, 132
Colleges, 39
Agricultural Sciences and Natural Resources, 39
Architecture and Planning, 39
Arts and Sciences, 40
Business Administration, 40
Communications, 41
Education, 41
Engineering, 42
Human Ecology, 42
Law, 42
Nursing, 43
Social Work, 43
Veterinary Medicine, 43
Committees
Doctoral, 22
Master's, 21
Specialist in Education, 22
Communications, 41
College of Speech Communication, 41
Business and Economic Research, Center for, 40, 187
Business Law, 47
Business Transactions, 128, 129
C
Calendar for 1998-99, 4
Campus Map, 200
Campus Security, 30
Career Services, 33
Catalog, i
Center for Applied and Professional Ethics, 40
Center for Business and Economic Research, 40, 187
Center for Environmental Biotechnology, 40
Center for Information Studies, 187
Center for International Education, i, 33
Center for Literacy Studies, 41, 187
Center for Livestock Diseases and Human Health, 188
Center for Materials Processing, 42, 188
Center for Measurement and Control Engineering, 42, 191
Center for Nursing Practice, 43
Center for Nursing Research, 43
Center for Physical Activity and Health, 41, 187
Center for Psychoanalysis and the Humanities, 40
Center for Quaternary Studies of the Southeastern U.S., 40
Center for Research, Service and Inquiry, 39
Center for the Study of War and Society, 40
Centers and Chairs of Excellence, 188
Change (Revision) of Program, 16
Change of Registration, 18
Chattanooga Graduate Education Program, 192
Chemical Engineering, 42, 73
Chemistry, 40, 74
Child and Family Studies, 42, 75
Child Behavior Institute, 40
Child Care, 34
Child Development Laboratories, 42, 188
Civil Engineering, 77
Civil and Environmental Engineering, 42, 77
Civil Engineering, 77
Classics, 40, 79
Classifications
Admission, 15
Residency, 25
Classified Research, 21
Clinical Psychology, 167
Cognitive, Definition of, 20
College Student Personnel, 92, 132
Colleges, 39
Agricultural Sciences and Natural Resources, 39
Architecture and Planning, 39
Arts and Sciences, 40
Business Administration, 40
Communications, 41
Education, 41
Engineering, 42
Human Ecology, 42
Law, 42
Nursing, 43
Social Work, 43
Veterinary Medicine, 43
Committees
Doctoral, 22
Master's, 21
Specialist in Education, 22
Communications, 41
College of Speech Communication, 41