### University Calendar For 1984-85

#### Winter Quarter, 1984

- **January 3-4** (Tuesday-Wednesday)  
  Registration  
  Classes Begin  
- **January 5** (Thursday)  
- **January 30-February 3** (Monday-Friday)  
  Advance Registration for Spring 1984  
- **February 8** (Wednesday)  
  Change of Registration Deadline  
- **March 14** (Wednesday)  
  Classes End  
- **March 16** (Friday)  
  Commencement

#### Spring Quarter, 1984

- **March 22-23** (Thursday-Friday)  
  Registration  
  Classes Begin  
- **March 26** (Monday)  
  Easter (No Classes)  
- **April 20-21** (Friday-Saturday)  
  Change of Registration Deadline  
- **April 30** (Monday)  
  Advance Registration for Summer 1984  
- **May 21-25** (Monday-Friday)  
  Advance Registration for Fall 1984  
- **June 5** (Tuesday)  
  Classes End  
- **June 8** (Friday)  
  Commencement

#### Summer Quarter, 1984

- **June 14-15** (Thursday-Friday)  
  Registration, First or Both Terms  
  Classes Begin  
- **June 18** (Monday)  
  Independence Day (No Classes)  
- **July 4** (Wednesday)  
  Change of Registration Deadline, First Term  
- **July 5** (Thursday)  
  Registration, Second Term  
- **July 18-19** (Wednesday-Thursday)  
  Classes End, First Term  
- **July 23** (Monday)  
  Change of Registration Deadline, Full Term  
- **July 27-29** (Monday-Friday)  
  Advance Registration for Fall 1984  
- **August 6** (Monday)  
  Change of Registration Deadline, Second Term  
- **August 22** (Wednesday)  
  Classes End  
- **August 25** (Saturday)  
  Commencement

#### Fall Quarter, 1984

- **September 17-19** (Monday-Wednesday)  
  Registration  
  Classes Begin  
- **September 20** (Thursday)  
  Advance Registration for Fall 1984  
- **October 24** (Wednesday)  
  Change of Registration Deadline, Full Term  
- **October 26** (Friday)  
  Classes End  
- **November 2** (Monday)  
  Advance Registration for Winter 1985  
- **November 10** (Saturday)  
  Homecoming (No Classes)  
- **November 22-24** (Thursday-Saturday)  
  Thanksgiving (No Classes)  
- **December 8** (Thursday)  
  Classes End  
- **December 10** (Monday)  
  Commencement

#### Winter Quarter, 1985

- **January 3-4** (Thursday-Friday)  
  Registration  
  Classes Begin  
- **January 5** (Saturday)  
  Advance Registration for Spring 1985  
- **February 8** (Friday)  
  Change of Registration Deadline  
- **March 16** (Saturday)  
  Classes End  
- **March 18** (Tuesday)  
  Commencement

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NOTE: Deadlines for degree requirements described on pp. 21-22.
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10 Introduction

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10 Types of Admissions
11 Admission Procedures
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Course Listings

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

Graduate Admissions and Records
Diana C. Lopez, Director of Graduate
Admissions and Records
Clea J. Greenawalt, Assistant Director of
Graduate Admissions and Records
218 Student Services Building

Regulations Subject To
Change
Any and all course offerings, academic requirements and other information contained in this publication are subject to change and/or revocation
without notice. Anyone interested in the precise course offering, academic requirement at a given time, or other special information should make
inquiry in advance.

Financial Assistance
Assistantships—Head of department
or program in which you plan to major
Fellowships and Scholarships—Assistant
Director, Graduate Admissions and Records
Loans, Work-Study—Director of Scholarships
and Financial Aid, 115 Student Services
Building

Housing
Married students—Office of Rental
Properties, 107 S. Stadium Hall
Single students—Office of Residence
Halls, 405 Student Services Building

Handicap Student Services
Counseling Services,
900 Volunteer Boulevard

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International Student Affairs
Director, 201 Alumni Hall
Registrar
Bob L. Cochran, 215 Student Services
Building

Timetable of Classes
Supervisor of Registration,
Registrar's Office

Veterans' Benefits
209 Student Services Building

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UTK does not discriminate on the basis of sex or handicap in the education programs and activities which it operates, pursuant to the requirements of Title IX of the Education Amendments of 1972, Pub. L. 92-318; and Section 504 of the Rehabilitation Act of 1973, Pub. L. 93-112; respectively. This policy extends to both employment by and admission to the University.

Inquiries concerning Title IX and Section 504 should be directed to the Office of the Vice Chancellor, 525 Andy Holt Tower, 974-4391. Charges of violation of the above policy should also be directed to the Office of the Vice Chancellor.
The University of Tennessee, Knoxville

Main Campus

Administration Parking Garage (APG) G-9
Alumni Hall (AH) J-8
Alumni Memorial Auditorium-Gymnasium (GYM) D-10
Andy Holt Avenue Apartments (AD) E-2
Andy Holt Tower (AHT) F-10
Army Reserve Training Center (RA) G-7
Art & Architecture (AA) E-7
Arts & Crafts (Laurel House) (ACH) A-7
Aquatic Center (AQC) F-2
Ayres Hall (A) C-11
Berry Hall (BH) E-12
Black Cultural Center (BCC) C-8
Tom Black Track & Recreation Area (BT) E-5
Clarence Brown Theatre (CBT) D-7
Buehler Hall (BU) C-11
Carousel Theatre (CT) E-7
Carrick Hall (CAH) D-4
Claxton Education Building (C) D-9
Clement Hall (CLH) B-7
Communications & University Extension Bldg. (COM) F-10
Conferences & Non-Credit Programs (CO) C-3
Craft House (CR) B-9
Credit Union (CU) D-6
Dabney Hall (DAB) C-11
Design House (DES) C-7
Dougherty Engineering Bldg. (DO) C-12
Dunford Hall (DUH) C-8
East Stadium Hall (ESH) D-11
Employment Office (EMP) C-4
Estabrook Hall (EST) D-11
Family Life Center (FLC) B-11
Ferris Hall (FH) D-12
Fraternity House (F)

Agricultural Campus

Agricultural Engineering Bldgs. (AE) K-3
C.E. Brehm Animal Science Lab (ASB) K-1
Corn-Cotton Bldg. (CC) J-2
Dairy Products Bldg. (DP) J-1
Fiber Research Laboratory (FL) L-4
Tennessee Division of Forestry (FOR) M-4
J.H. McLeod Food Technology Bldg. (FT) J-1
Greenhouses (GH) I-2
McCord Hall (MC) I-1
Morgan Hall (MH) J-2
Plot Barn (PB) K-4
Poultry Diagnostic Laboratory (PO) L-4
Power Plant (PPL) 1-3
Printing and Supply (PR) M-4
Plant Sciences (Ellington Hall) (PS) K-3
Plant Sciences Annex (PSX) L-3
Spinning Lab (SL) L-4
College of Veterinary Medicine (Clyde York Bldg.) (V) M-2

Geology and Geography Bldg. (G&G) C-11
Gibbs Hall (GIB) F-7
Glocker Business Administration Bldg. (G) C-8
Greve Hall (GRH) C-7
Harris Home Economics Bldg. (HE) B-11
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Hearing & Speech Center (HSC) E-10
Henson Hall (H) D-8
Hesler Biology Bldg. (H) C-10
Hess Hall (HEH) D-8
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Hoskins (Main) Library (LIB) B-10
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Agricultural Campus

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C.E. Brehm Animal Science Lab (ASB) K-1
Corn-Cotton Bldg. (CC) J-2
Dairy Products Bldg. (DP) J-1
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Tennessee Division of Forestry (FOR) M-4
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Morgan Hall (MH) J-2
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Plant Sciences (Ellington Hall) (PS) K-3
Plant Sciences Annex (PSX) L-3
Spinning Lab (SL) L-4
College of Veterinary Medicine (Clyde York Bldg.) (V) M-2
# The Graduate Council

## Membership July 1, 1983

### Ex Officio Members
- Clarence W. Minkel, Vice Provost and Dean
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- Mary P. Richards, Associate Dean
- Thomas H. Klindt, Assistant Dean
- Dr. Robert S. Garfinkel
- Dr. Malcolm McInnis
- Dr. Kenneth B. Kenney
- Dr. Richard J. Courtney

### Appointed Members
- Dec. 31, 1984
- Dec. 31, 1984
- Dec. 31, 1983
- Dec. 31, 1983

### Elected Members

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<td>Dr. Luther Wilhelm</td>
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<td>Dr. Curtis Melton</td>
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<td>Dr. David J. Barnaby</td>
<td>Dec. 31, 1984</td>
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<td>Dr. Robert B. Woodruff</td>
<td>Dec. 31, 1985</td>
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<td>Dr. Mark Miller</td>
<td>Dec. 31, 1985</td>
<td>Dr. Michael Singletary</td>
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<td>Col. of Communications</td>
<td>Dr. Don B. Franks</td>
<td>Dec. 31, 1984</td>
<td>Dr. Donald J. Dickinson</td>
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<td>Dr. Paul A. Wishart</td>
<td>Dec. 31, 1984</td>
<td>Dr. David Craig</td>
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<td>Dr. William A. Poppen</td>
<td>Dec. 31, 1985</td>
<td>Dr. James A. Miller</td>
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<td>Dr. Lester Knight</td>
<td>Dec. 31, 1983</td>
<td>Dr. Gerald Ubben</td>
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<td>Dr. John Lovell</td>
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<td>Dr. Charles F. Moore</td>
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<td>Dr. Mancil Milligan</td>
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<td>Dr. Imogene Ford</td>
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<td>Dr. John T. Smith</td>
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<td>Dr. Raymond W. Holton</td>
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<td>Dr. Percy G. Adams</td>
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<td>Dr. Patrick J. Carney</td>
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<td>Dr. Arthur Echternacht</td>
<td>Dec. 31, 1984</td>
<td>Dr. Suzeanne B. Kurth</td>
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<td>Dr. Allan G. Yeomans</td>
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<td>Graduate Student Council</td>
<td>Ms. Jhan Erwin</td>
<td>Apr. 30, 1984</td>
<td>Dr. Mildred Fenske</td>
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<td>Ms. Debbie Steuber</td>
<td>Apr. 30, 1984</td>
<td>Dr. Robert Bonovich</td>
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<td>Dr. J. B. Young</td>
<td>Dec. 31, 1985</td>
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The University of Tennessee

Board of Trustees

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

From Congressional Districts

Buford Goldstein, Elizabethon
A. B. Long, Jr., Knoxville
Scott Probasco, Jr., Lookout Mountain
William M. Johnson, Sparta
Marcia A. Echols, Nashville
Ben S. Kimbrough, Clarksville
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Tom Elam, Union City
R. Lee Winchester, Memphis

TERM EXPIRES
June 1, 1984
June 1, 1986
June 1, 1987
June 1, 1988
June 1, 1991
July 1, 1990
June 1, 1988
June 1, 1986
June 1, 1984

From Anderson, Bedford, Coffee, Franklin, Lincoln, Moore, and Warren Counties
Charlotte Parish
TERM EXPIRES
June 1, 1988

From Davidson County
Elaine McReynolds
June 1, 1984

From Hamilton County
Paul J. Kinser
June 1, 1987

From Knox County
Ann Baker Furrow
June 1, 1989
James A. Haslam, III
June 1, 1989

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Sam Cooper
June 1, 1990
Jack Craddock
June 1, 1990

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A. David Martin, B.S., M.B.A., C.P.A., Treasurer

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Jack E. Reese, A.B., A.M., Ph.D., Chancellor
Luke Ebersole, A.B., A.M., Ph.D., Vice Chancellor for Planning and Administration
Walter R. Herndon, B.S., M.S., Ph.D., Acting Provost
L. Evans Roth, A.B., A.M., Ph.D., Vice Chancellor for Research
Homer F. Fisher, B.S., M.B.A., Executive Vice Chancellor for Business and Finance
Howard F. Aldmon, B.S., A.M., Ed.D., Vice Chancellor for Student Affairs
C. W. Minkel, B.A., M.A., Ph.D., Vice Provost and Dean of The Graduate School
Marla P. Peterson, B.A., M.A., Ph.D., Dean for Research
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Kenneth L. Penegar, A.B., J.D., LL.M., Dean of the College of Law
Robert G. Landen, A.B., A.M., Ph.D., Dean of the College of Liberal Arts
Sylvia E. Hart, B.S.N., M.S.N., Ph.D., Dean of the College of Nursing
Hyram Kitchen, M.S., D.V.M., Ph.D., Dean of the College of Veterinary Medicine
Joseph P. Goddard, B.S., M.S., Ed.D., Dean of the Division of Continuing Education
Gerald D. Bowker, B.A., M.A., Dean of Admissions (Undergraduate) and Records

From Weakley County
James F. Harrison
TERM EXPIRES
June 1, 1990

Student Member
John Craig
July 1, 1984

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Governor Lamar Alexander, Chairman
T. O. Lashlee, Vice Chairman
Edward J. Boling, President
A. David Martin, Treasurer
Beauchamp Brogan, Secretary
Linda Logan, Assistant Secretary
**Majors and Degree Programs**

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<tr>
<th>MAJOR</th>
<th>DEGREE</th>
<th>ADMISSION TEST REQUIRED</th>
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<td>3 G.S. Rating Forms^11</td>
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<td>Child and Family Studies</td>
<td>MS</td>
<td>X</td>
<td>All MS &amp; PhD applicants</td>
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<td>X</td>
<td>3 G.S. Rating Forms &amp; Dept. Application from Associate Dean, College of Home Economics</td>
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<td>*Nutrition</td>
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<td>*English</td>
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<td>French</td>
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<td>Geography</td>
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<td>*Microbiology</td>
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<td>*Music</td>
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<td>Spanish</td>
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<td>*Speech and Hearing Science</td>
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<td>*Speech Pathology</td>
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<td>Speech and Theatre</td>
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<td>*Theatre</td>
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<td>Zoology</td>
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<td>College of Nursing</td>
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<td>1 G.S. Rating Form &amp; Dept. Application</td>
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<td>School of Biomedical Sciences</td>
<td>MS, PhD</td>
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<td>*Biomedical Sciences</td>
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<td>3 Rating Forms &amp; Dept. Application</td>
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<td>School of Library and Information Science</td>
<td>MSLS</td>
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<td>School of Planning</td>
<td>MSP</td>
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<td>2 Letters of Recommendation &amp; Personal Statement</td>
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<tr>
<td>School of Social Work</td>
<td>MSSW, PhD</td>
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<td>*Social Work (Knoxville, Memphis, Nashville)</td>
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<td>3 Rating Forms &amp; Dept. Application</td>
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</table>

*Non-degree and provisional students must obtain permission from the department/program head in order to register for courses in these fields.

1American applicants only.
2International applicants only.
3EdS applicants only.
4EdD applicants only.
5Doctoral applicants only.
6Department doctoral option offered under the major of home economics.
7Department interdisciplinary option offered in each department.
8Offered at UT Space Institute.
9G.S. Rating Form submitted to Office of Graduate Admissions and Records.
10G.S. Rating Form submitted to Department.
11Forms obtained from & returned to Department.
12For Financial Assistance only.
The Graduate School

Clarence W. Minkel, Vice Provost and Dean of The Graduate School
Mary P. Richards, Associate Dean of The Graduate School
Thomas H. Klint, Assistant Dean of The Graduate School
Diana Lopez, Director, Graduate Admissions and Records
Clea Greenawalt, Assistant Director, Graduate Admissions and Records

The University of Tennessee, Knoxville is the official land-grant institution for the State of Tennessee. It is a comprehensive institution offering a wide range of graduate programs leading to the Master's and doctoral degrees. The University offers Master's programs in 112 fields of specialization and doctoral work in 52. Approximately 6,000 graduate students are enrolled both on and off campus. Administration of graduate student policies and procedures, and associated record keeping, is the responsibility of the Dean of The Graduate School. 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 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 students desiring full-time work toward the Master's and doctoral degrees or professional certification, those interested in continuing education for updating and broadening knowledge, and those pursuing postdoctoral research. Traditionally, universities have provided graduate programs primarily for full-time, degree-oriented students. Serving the needs of students engaged full-time in intensive study and pursuit of a degree continues to be a major emphasis of UT's graduate effort. At the same time, the University employs a variety of modes, traditional and non-traditional, in offering quality programs designed to serve students. The policies of The Graduate School are developed by the Graduate Council, a body composed of elected representatives from each college, the School of Social Work, the Space Institute, the Graduate Student Council, and five appointed members. Ex-officio members include the Dean, Associate Dean, and Assistant Dean of The Graduate School, and the Chair of the Research Council. The Graduate Office develops procedures to carry out the policies formulated by the Council, and has primary responsibility for Graduate School admissions and records.

A graduate student must assume full responsibility for knowledge of rules and regulations of The Graduate School and departmental requirements for the chosen degree program. Individual colleges and departments may have requirements beyond the minimum established by The Graduate School. The Graduate School News, published quarterly, includes a calendar of deadlines, new policies and procedures of The Graduate School, and changes in degree programs. The News contains the latest information on Graduate School matters, some of which may supersede this catalog. Copies of the News are available at the Office of Graduate Admissions and Records during the registration period at the beginning of each quarter. A statement on graduate students' rights and responsibilities is printed on the back of the student's admission status form. Additional copies are available at the Office of Graduate Admissions and Records.

Admission and Registration

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. Admission to The Graduate School does not ensure acceptance into a specific degree program or admission to candidacy for the degree desired. When a student is admitted to The Graduate School prior to having received the baccalaureate degree, that degree must be awarded prior to the date of first registration in The Graduate School. If a student does not enroll within one year after the requested admission, the application process must be repeated.

Types of Admissions

Admission to a Graduate Degree Program: To earn graduate credit, a student must be enrolled in one of the categories listed below. Course work taken in any other status is unacceptable for graduate credit and cannot be changed to graduate credit.

Admission to a degree program requires a minimum grade point average of 2.5 out of a possible 4.0, or a 3.0 during the senior year. However, many departments require a higher average. The equivalent of a minimum B average is required for international students.

In addition to meeting the minimum requirements for admission to 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 admission tests for graduate studies, letters of recommendation from professors familiar with the applicant's capabilities, and similar evidence of scholarly achievement.

Refer to pages 8-9 and to descriptions of programs for specific requirements for admission.

Non-Degree Admission: Applicants may apply for non-degree status who, for example:
1. do not desire to pursue a degree program;
2. have already received an advanced degree;
3. need additional time to fulfill application requirements for a degree program.

There is no specific limit on the number of courses that a student may take in non-degree status. However, within 18 hours of graduate course work in this status, the student must either:
1. apply and be admitted to a specific degree program (see Change of Program, p. 16, for instructions); or
2. file a Plan of Study form with the Office of Graduate Admissions and Records 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 18 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.
The graduate application, $10 application fee, and two (2) official transcripts from each institution previously attended are required for consideration to a graduate student. The minimum requirements are a Bachelor's degree with a 2.5 grade point average on a 4.0 scale (or a 3.0 the senior year) from a college or university accredited by the appropriate regional accrediting agency.
A major area need not be declared, but some departments do not permit non-degree students to register for graduate courses. (See pages 8-9 for information on restricted courses unrestricted may be obtained from the department or from The Graduate School.
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.
Students must maintain a 3.0 grade point average to continue enrollment in this status.
An international student on a non-immigrant visa may not enroll in the non-degree status. Provisional Admission: Applicants may be admitted as provisional students for one quarter (or, for one course in each of two quarters) who, for example:
1. desire graduate credit for a limited number of courses;
2. do not meet the minimum grade point average requirements;
3. wish to register for graduate courses while meeting any additional requirements for non-degree.
Admission of International Students: The University will not enroll any student whose native language is not English unless the student can demonstrate proficiency in English. (Notarized copies are not acceptable.)
Eligibility of Seniors: Subject to approval by The Graduate School, a senior at UTK who needs fewer than 45 quarter hours to complete the 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 course work does not exceed 15 credit hours per quarter. Approval must be obtained each quarter from the Office of Graduate Admissions and Records.
Enrollment of Veterinary Medicine Students in Graduate Courses: A student in good standing in the College of Veterinary Medicine may enroll in UTK 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 15 quarter hours of graduate courses during the D.V.M. program.
3. Approval must be obtained each quarter at registration through the Office of Graduate Admissions and Records. The student's progress is subject to review and approval each quarter by the Associate Dean, College of Veterinary Medicine.
Admission of Faculty Members: Faculty members of UTK or the Institute of Agriculture at the rank of assistant professor or above, and employees of the administrative staff at UTK, the UT Central Administration, and the Institute of Agriculture will not normally be admitted to candidacy for a doctoral degree at UTK. Exception is on an individual basis. Further information is provided in the Faculty Handbook. Possible conflict of interest will be a major factor considered in the review of any request.
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 completed. 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 Graduate Catalog).
2. A $10 application fee.
3. Two copies of official transcripts from all colleges and universities attended.
4. Reference letters or rating forms (pages 8-9). Forms obtained from the college or department should be returned to the same source.
5. Scores from examinations which may be required for admission.

Graduate programs which require scores from the Graduate Record Examination or the Graduate Management Admission Test are shown on pages 8-9. The TOEFL is required of all students whose native language is not English, unless they have graduated from a regionally accredited U.S. institution.

Application forms for the above tests can be obtained by writing:
Educational Testing Service
Princeton, NJ 08540

UTK is an approved testing center for all tests. Notice of the categories to be contained in a report of student records. This act provides for confidentiality of such 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, degree 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.

Family Educational Rights and Privacy Act
This act provides for confidentiality of student records. However, it also provides for basic identification of persons at UTK 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, degree 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.

Student Identification Number
UTK 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 January 1, 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 purposes of reporting and accurate retrieval of records and for conducting business about their own records, students and alumni must give their student identification number. Student identification numbers, whether social security numbers or assigned numbers, are used administratively within the University only and are not given to third parties without expressed consent of the student.

Fees, Residency, Classification, and Financial Aid
University Fees
University fees are determined by the Board of Trustees and are subject to change without notice. The general fees in effect for graduate students are as follows:

APPLICATION FEE: $10
Each graduate application for admission must be accompanied by a fee of $10 before it will be processed. (Fee not required if: (1) former UTK graduate student; or (2) previously paid to UTK Graduate School within past 12 months.)

If a student applies but does not enter graduate school within twelve months after date of requested admission it will be necessary to resubmit the $10 application fee and application. This fee is not refundable.

MAINTENANCE FEE (all students):

| PER QUARTER | $309 |
| PER QUARTER | $587 |

NOTE: In lieu of the above charge for tuition and/or maintenance fee, part-time students may elect to pay fees computed by the quarter hour credit (or audit) as follows:

In-State:
$44 per quarter hour or fraction thereof; minimum charge $132.

Out-of-State:
$132 per quarter hour or fraction thereof; minimum charge $306.

UNIVERSITY PROGRAMS AND SERVICES FEE:

| PER QUARTER | $46 |

The fee for the summer quarter is $35.
Part-time students taking fewer than 9 quarter hours will be assessed at the rate of $3 per quarter hour or fraction thereof; minimum charge $9.

Graduate and teaching assistants, as well as fellowship students who may have waiver of fees (tuition and/or maintenance), must pay the appropriate University Programs and Services Fee.

Knoxville campus day students taking a course load of 6-8 hours may elect to pay the full programs and services fee. Knoxville campus day students taking a course load of 3-5 hours may elect to pay the $13 student health fee plus the appropriate part-time programs and services fee. The student health fee is included in the full $46 programs and services fee.

This fee is not refundable.

LATE REGISTRATION FEE:
All students are required to have a validated fee receipt to complete the registration procedure. This includes students whose fees are billed, prepaid, or waived. Students who do not complete registration on the regular dates scheduled for this purpose will be charged a late registration fee of $2 up to $60. See the University General Catalog for application of this fee. Doctoral students who must register retroactively for dissertation credit will be charged a late fee of $35 for each
quarter of retroactive registration. The payment of fees with a check which is not honored by the bank will incur a service charge of $10 to $45, depending on the date the check is redeemed.

**MUSIC FEE:**
- One half-hour lesson per week, per quarter: $20
- One-hour lesson per week, per quarter: $40

Payable at registration by students receiving individual instruction in music.

**GRADUATION FEE:**
- Master's degree candidates: $16
- Doctoral degree candidates: $51

There is no additional charge for diploma, binding, or microfilming. The graduation fee is non-refundable and is valid for three quarters after the quarter in which it is paid.

**DEFERRED PAYMENT SERVICE FEE:** $5

This fee is applicable when the payment of any part of a student's account is deferred, including accounts which must be billed to outside agencies, organizations, and institutions. This fee is also applicable when any additional charge (out-of-state tuition, music fee, room and board adjustment) is not paid within five regular business days after the date it was incurred.

It is the student's responsibility to take the initiative to pay all University obligations promptly.

**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.

**REFUND OF FEES FOR WITHDRAWAL:**
- Once a schedule has been received by the student, withdrawal from school for the quarter must be by official notification to the Withdrawal Office, Student Counseling Services Center, 900 Volunteer Boulevard, whether or not fees have been paid, classes have been attended, or the schedule is incomplete. Failure to attend class does not automatically withdraw or drop a student from school or class.

The effective date of withdrawal is the date the Withdrawal Office is notified by completion of the official withdrawal request form. The appropriate percentage of fees will be charged unless this action is completed by the close of the last day designated for regular registration and before the first official day of classes for the quarter. Failure to notify the Withdrawal Office promptly when withdrawing could result in a larger fee assessment. Withdrawal does not cancel fees and charges already incurred.

Drop/add procedures must not be used to withdraw from school for the quarter. For a regular academic quarter, withdrawal within 7 calendar days beginning with the first day following regular registration permits a 90 percent fee refund. Withdrawal between 8 and 14 calendar days following regular registration permits a 70 percent fee refund. Withdrawal between 15 and 21 calendar days following regular registration permits a 50 percent fee refund. Withdrawal between 22 and 28 calendar days following regular registration permits a 25 percent fee refund. The above withdrawal refund policy does not apply to the

*Residency Classification for Tuition Purposes*

When a prospective student applies to The Graduate School, they are notified of residency classification (in-state or out-of-state) for tuition purposes.

Classification is based on information supplied in the Graduate Application for Admission. A student does not acquire in-state residency status while enrolled full-time at a higher educational institution in Tennessee. Proof of in-state residence is the responsibility of the individual.

A student who is classified out-of-state and (1) resides in Tennessee, (2) works full-time in the state or at Fort Campbell, Kentucky, and (3) desires to attend UTK on a part-time basis (maximum 6 hours of course work per quarter), is eligible for a waiver of out-of-state tuition. The student must apply for the waiver prior to the date of registration each quarter.

Forms are available from the Residency Clerk in the Office of Graduate Admissions and Records.

A student wishing to appeal a residency classification should contact the Residency Clerk, who will provide an application for reconsideration and a copy of the State regulations. The application must be submitted on or before the last day of registration for a given quarter, if the student is to be considered for reconsideration that quarter.

*Academic Common Market*

The Academic Common Market is an interstate agreement among Southern states for sharing unique programs. Participating states are able to make arrangements for their residents who are fully admitted to specific programs at UTK on an in-state tuition basis, where 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, South Carolina, Tennessee, Texas, Virginia and West Virginia. Twenty doctoral, one Specialist in Education, and sixteen Master’s programs at UTK are approved by the Academic Common Market for residents of these states to enroll at in-state tuition rates.

Residents of one of the member states who seek further information should contact the Residency Clerk in the Office of Graduate Admissions and Records or the Southern Regional Educational Board, 130 Sixth Street, N.W., Atlanta, GA 30313.

*Financial Aid*

UTK offers several types of financial assistance for which graduate students may apply:

**Assistantships and Fellowships:** Graduate assistantships, scholarships, and traineeships are offered through many departments. Information concerning these types of assistance can be obtained from the department in which the student plans to study.
The Hilton A. Smith Graduate Fellowships for full-time study at UTK are awarded on the basis of scholarly performance as evidenced by grades and faculty recommendations. Candidates from any field of study are invited to apply if they have a 3.4 grade point average or above in all previous academic work. The fellowships include monthly stipends, tuition, and living expenses. These fellowships are available from the Office of Graduate Admissions and Records after November.

Completed applications, including all supporting materials, must be submitted to the Assistant Director of Graduate Admissions by February 15. Offers of awards are announced by March 15.

Employment: Three sources of student employment are coordinated by the Office of Scholarships and Financial Aid: (1) The federally-sponsored College Work-Study Program provides part-time jobs for U.S. citizens or permanent residents who have demonstrated financial need by the Financial Aid Form or Family Financial Statement. (2) Job Location and Development Office lists off-campus, part-time, and full-time job opportunities with agencies and companies throughout the Knoxville area. Job interviews and minimal processing are required. Off-campus jobs are limited to U.S. citizens or permanent residents. (3) On-campus, part-time job opportunities are listed by the Student Employment Service. This listing of part-time jobs is based upon requests from on-campus agencies. Referrals are made in accordance with a student's skills and interests.

Students needing either part-time or full-time employment are urged to contact the Job Location and Development Office. The Office of Scholarships and Financial Aid will endeavor to obtain job opportunities for all interested students.

Loans: Three types of loans are administered by the Office of Scholarships and Financial Aid: (1) National Direct Student Loans (FAF or FFS must be filed); (2) The University of Tennessee Student Loans; (3) Guaranteed Student Loans, financed by certain lending institutions. The student should allow for three months' total processing time when applying for a loan.

Students must apply through the Office of Scholarships and Financial Aid for all loan programs. Loans are limited to U.S. citizens or permanent residents.

Financial aid programs, policies and procedures are subject to change. Students receiving financial aid are expected to maintain satisfactory financial aid progress standards. Information and applications can be obtained from the Office of Scholarships and Financial Aid.

Veterans' Benefits: Veterans, and widows or children of certain deceased or disabled veterans, who have been admitted to a degree program, can 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 quarter.

## General Regulations of The Graduate School

### 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 before each registration and any changes in it. 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 candidate's promise as a scholar. As early as appropriate the student requests the professor in the major department to serve as the major professor. The major professor and student together select a graduate committee.

### 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 undergraduates are examined and evaluated by the appropriate department before admission to a degree program. Questions about program prerequisites should be addressed to the advisor.

### Course Listings

Each course listing in the Graduate Catalog contains information on a course.

Primary Department: The course number indicates the level at which the course is taught. All 5000-6000 level courses are graduate courses. The 3000-4000 level courses are upper division courses available for graduate credit if listed in the Graduate Catalog, unless noted otherwise. To receive graduate credit for these, a student must so indicate on the registration material.

Official title: The official course title appears in the catalog. The course title indicates the level at which the course is taught. All 5000-6000 level courses are graduate courses. The 3000-4000 level courses are upper division courses available for graduate credit if listed in the Graduate Catalog, unless noted otherwise. To receive graduate credit for these, a student must so indicate on the registration material.

Course description: The course description indicates the level at which the course is taught. This number is a guide for students and for advisors. The course description is given only under the primary department. It is the responsibility of the student to research courses offered in other departments.

Course loads: The maximum load for a graduate student is 15 hours. Students who have been admitted to a degree program may be cross-listed with two or more departments, an arrangement indicated by a prefix of a supplementary department (e.g. Psychology 5432). The course description is given only under the primary department.

The course description is a symbol indicating the quarter of frequency that the course normally is offered:

- F—Fall
- S—Summer
- W—Winter
- E—Every quarter
- Sp—Spring
- A—Alternate years
- Su—Summer
- S/NC only indicates that the course may be taken only for Satisfactory/No Credit grading. Refer to section on Grading System.

At the end of most course descriptions is a symbol indicating the quarter or frequency that the course normally is offered:

- F—Fall
- S—Summer
- W—Winter
- E—Every quarter
- 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 several weeks prior to each quarter, is the official notification of courses offered for a specific quarter. Students should contact the appropriate department/program head concerning courses to be offered in future quarters.

### 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 5 consecutive instructional days after the beginning of classes.

Students who fail to attend the first class meeting will 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.

The deadline for change of registration (e.g. from graduate to undergraduate, undergraduate to graduate, withdrawal) is set at mid-term, approximately 35 calendar days after the first day of classes each quarter. A student may change registration for a course at any time prior to and including this date by executing a change of registration form and submitting it to the Office of Graduate Admissions and Records. The signature of the advisor or department head is required on the form for all changes. The instructor's signature is required if the course is closed and/or after the first two weeks of classes. If the student withdraws from a course or from the University after the first 5 days of classes and before the change of registration deadline, he/she will receive a grade of W on the permanent record.
Course registration may not be changed from credit to audit after the first five days of classes. 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 in any way after the deadline, a student must present the request, together with documentary evidence of the 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 also as evidence of their knowledge of the request. If the request is approved, the Office of Graduate Admissions and Records will notify the Office of Admissions. The student must enter the change on the student’s permanent record.

## Grading System

An average of B (3.0) on course work taken at UTK is required to receive any graduate degree from the University. Grades in The Graduate School have the following meanings:

- A (4 quality points per quarter hour), superior performance.
- B+ (3.5 quality points per quarter hour), better than satisfactory performance.
- B (3 quality points per quarter hour), satisfactory performance.
- C+ (2.5 quality points per quarter hour), less than satisfactory performance.
- C (2 quality points per quarter hour), performance below the standard expected of graduate students.
- D (1 quality point per quarter 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), temporary grade. (no quality points), temporary grade. A student who 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 two quarters, excluding the summer quarter. If a supplementary grade report has not been received in the Office of Graduate Admissions and Records at the end of the second quarter, the I will be changed to an F.

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 in any way after the deadline, a student must present the request, together with documentary evidence of the 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 also as evidence of their knowledge of the request. If the request is approved, the Office of Graduate Admissions and Records will notify the Office of Admissions. The student must enter the change on the student’s permanent record.

### Proficiency Examinations

A proficiency examination may be given in academic examinations taken 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 dean of the department offering the course. Students applying for this privilege must present evidence to the knowledge and abilities expected of graduate students who have taken the same course. Upon passing such an examination with a minimum grade of B, the student will receive graduate credit. A student who wishes to change one-fourth of the total credit hours into a Master's degree program may be approved by this method, subject to the approval of the student's graduate committee. A fee of $10 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

Any student whose native language is not English must present a TOEFL score of at least 525 unless he or she has received a Bachelor's or Master's degree from an accredited institution in the United States. Some departments require a higher minimum TOEFL score. The student must also 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 1221—Written and Oral English for Foreign Students. If the student is not prepared to enter English 1221, he or she must take a proficiency examination with the Office of Graduate Admissions and Records.

### Correspondence Study

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

### Transfer Credits

Official transcripts must be sent directly to the Office of Graduate Admissions and Records from all institutions previously attended. No credit will be counted in determining the student's grade point average.Credits transferred cannot be used toward meeting degree requirements. Credit for extension courses taken at other institutions is not transferable.

### Law Courses

A graduate student may take up to six 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 C or better, an S will be recorded on the transcript. Below a B, 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 GPA (law or graduate). Grades earned in law courses do not carry graduate credit.

Different rules apply to students enrolled in the Dual J.D.-MBA program. 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 p. 38 for grades acceptable to meet degree requirements. Only one cumulative GPA (law or graduate) will be used in the student's transcript until graduation, at which time both the graduate and law cumulative will be added to the permanent record.

A student enrolled in the DBA program may use 8 semester hours or more of law courses for the supporting area under the arrangement described on p. 37.

### Auditors and Audited Courses

Persons who wish to attend certain classes regularly, without taking examinations or receiving grades of credit, may do so by completing a graduate application, paying the appropriate 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 credit of audited coursework will appear on the permanent record.

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A student enrolled in the DBA program may use 8 semester hours or more of law courses for the supporting area under the arrangement described on p. 37.
Presentation of Theses and Dissertations

If a thesis or dissertation is not accepted, the student must make corrections and resubmit the materials.

The student and major professor together should submit the correct format for theses or dissertations. A Thesis Workshop is held each fall to assist students with writing theses and dissertations. The date for each Workshop is announced in the Graduate School News.

Academic Termination

Graduate education requires continuous evaluation of the student. This evaluation includes not only periodic objective evaluations but also subjective appraisal by the faculty of the student's progress and potential. Continuation in a program is determined by the consideration of all these factors by the faculty and the department head.

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

Appeals Procedure

The student handbook, Hill Topics, published and distributed annually, contains statements of UTK standards of conduct and of all disciplinary regulations and procedures. Normal grievances should be handled at the departmental level through the student's advisor or the department or program head. Further appeal may be made to the Dean of the Graduate School, the Graduate Council, and the Chancellor. The By-Laws of the University (Article V, section 7) provide that any individual may ultimately appeal to the Board of Trustees, through the President. A copy of the Appeals Procedure is available in the Office of Graduate Admissions and Records.

Facilities and Services

Housing

Single Men and Women: Single graduate students are provided accommodations in facilities conducive to academic achievement and personal development. Single graduate students have the same priority as other single students and may request individual halls or residence halls. The assistant head resident aids the residence hall advisor in coordinating residence life. Graduate students have tended to prefer accommodations offered in Melrose and the Apartment Residence Halls. Melrose Hall offers community living units for groups of six to ten students with personal responsibility emphasized. The HoT Haven Apartments Residence Hall accommodates students in groups of four. It is the responsibility of each resident to maintain the apartment to University standards. Further information can be obtained from the Office of Residence Halls, 495 Student Services Building.

Married Students: The University provides excellence in student facilities in several locations for married students. Information and application for these facilities may be obtained from the Office of Residence Halls, 405 Student Services Building.

Off-Campus Housing: Information and assistance in locating off-campus housing are available in the Off-Campus Housing Office, 336 University Center.

Vehicle Operation

And Parking

The University of Tennessee endeavors to provide adequate facilities for vehicles operated by students and staff. However, areas available for parking are necessarily limited. To reduce traffic congestion within the campus area, large student parking areas are located on the perimeter of the campus. Presently, FREE bus service is provided from the Main Campus to the Agricultural Campus. Also, bus service is provided to Married Student Housing Units at a nominal fee.

Each person who operates a motor vehicle in connection with attendance or employment at the University, is responsible for obtaining a license and registering it with the traffic section of the Security Department. A University Traffic and Parking Authority determines the 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 Security Building, 1115 UT Drive, and at the Campus Information Center at Circle Park.

Services to the Physically Disabled

Services for students with physical disabilities, whether permanent or temporary, are coordinated by the Office of the Dean of Admissions and Records, 305 Student Services Building. In conjunction with the Physical Plant Office, the UT Bookstore, the Student Activities Office, and academic departments, the office seeks to assure that attendance at UT is as convenient as possible for students with physical disabilities. These services include assistance during registration (pre-registration; collection of class schedules, payments on account, residence hall accommodations), acquisition of special parking permits, elevator keys, tickets for special events, and similar...
efforts to relieve the special mobility problems of the students. The Physical Plant Office coordinates efforts to eliminate physical barriers to the extent possible, with priority being given to academic buildings.

The Office of the Dean of Admissions and Records assists students in the scheduling of special class sections to respond to the particular needs of the physically handicapped.

The Office of Handicapped Student Services, 900 Volunteer Boulevard (Ground Floor—Student Counseling Center Building) offers a memnol support for the Association and functions in an advocacy capacity for disabled students. The services include counseling for all disabled students, interpreters for hearing-impaired students, Braille or large print course materials and auditory aids for sight and other print-impaired students. Also, the office assists with ordering recorded textbooks. As the needs of disabled students vary, the office seeks to individualize assistance to accommodate them. Further information is available in the Handicapped Student Services brochure.

The University Library

The University of Tennessee, Knoxville

The University Library owns approximately 1,450,000 volumes, more than 2,200,000 manuscripts, 62,000 microfilm reels and 1,400,000 items of other microtext, plus recordings, tapes, United States and United Nations documents, and more than 20,000 periodicals and other serial titles, which are received annually. The library provides bibliographic services offered by other services. Reference provides access to materials are of particular interest to scholars. Tennesseana, and other specialities, including legislative papers and mementoes of many Tennessee political figures. The Radiation Biology Archives comprises the files of a group of internationally renowned scientists. Special Collections materials are of particular interest to scholars in the fields of history, political science, social sciences, biological sciences, and the arts.

Library research holdings for faculty and graduate students are augmented by the Reference Department and by Interlibrary Services. Reference provides access to bibliographic services offered by other institutions, such as computer-based data services and information retrieval, while Interlibrary Services borrows monographs and obtains copies of other material.

The Law Library on the Knoxville campus and the libraries located on the campuses in Chattanooga, Martin, Memphis, and Tullahoma are individually administered; each library of The University of Tennessee is accessible to all students and faculty in the system.

Computing Center

The University of Tennessee Computing Center (UTCC) provides computing facilities and services for the University's teaching, research, public service, and administrative activities. UTCC offices and principal computing facilities are located on the first two floors of the Stokely Management Center (SMC) and on the P2 level and first floor of Andy Holt Tower. The computers at SMC include two IBM 370/3031's, an IBM 4341/2, a DECSystem-10 with dual KL-10 processors in a symmetrical multi-processor (SMP) configuration, and a DEC PDP 11/55. (Installation of an IBM 3081 to replace the IBM 3031's is scheduled for December 1983.) An IBM 360/40 located in Andy Holt Tower is used exclusively for administrative work. Data entry services are provided with two Nixdorf 600/55 key-to-disk systems also located in Andy Holt Tower.

Each IBM 3031's operate under MVS/SP with JES2, the IBM 4341 operates under VM/SP and the IBM 360/40 operates under DOS with POWER II. The DECSystem-10 operates under TOPS-10 with Galaxy.

Time sharing features on the IBM computers include Coursewriter III and VM/CMS, with FORTRAN, P/L, COBOL, Pascal, and SAS/GRAPH. The DECSystem-10 time sharing system provides APL, FORTRAN, BASIC, COBOL, MACRO, and other special purpose application programs, including extensive graphics software support. Each IBM 3031 has six million bytes of memory, the IBM 4341/2 has eight million bytes of memory, and the DECSystem-10 has 1.25 million words of memory.

UTCC maintains eight remote job entry stations for batch work and 15 sites for interactive computer work on the Knoxville campus and supplies computing services to the other campuses in the UT system through remote job entry facilities.

A graphics center with two Tektronix graphics terminals, five storage and five refresh, two digitizing tablets, and a graphics plotter is located in Ferris Hall. Additional graphics equipment, including three terminals, a large digitizing tablet, and a plotter, is located in the user work area in the Art and Architecture Building. A Calcomp 1051 plotter is used to produce graphics output from jobs run on both the IBM and DECSystem-10 computers.

UTCC publishes a User's Guide which describes the use of the IBM computers and the DECSystem-10 User's Guide which describes the use of the DECSystem-10. The guides are available at the UT Book and Supply Store. UTCC also publishes a monthly Newsletter which announces systems, equipment and procedural changes and contains other items of interest to users. Program writeups and special user's guides are also available.

UTCC periodically offers intensive training seminars on the utilization of the IBM and DECSystem-10 computers for faculty, staff and graduate students. UTCC also offers non-credit short courses each quarter in topics such as programming languages and special purpose programs. These courses are announced in the UTCC Newsletter, the "Campus Capsule" section of the UT Daily Beacon, and "this week on campus", a publication announcing campus events.

Computing services can be requested via the request for services form available from the receptionist, 200 Stokely Management Center. All users of UTCC facilities are assigned a consultant to provide user assistance.

Center for International Education

This office, located at 201 Alumni Hall, assists students from other countries with the many matters that are of particular concern during their stay at UTK. The Center serves as the official University representative in all matters involving immigration authorities, international educational organizations, and foreign governments.

The office maintains the student's official immigration records and handles questions regarding immigration regulations. It coordinates such projects as a community volunteer program for international students, a Friendship Family program, and activities for student spouses. To aid the international student's understanding of American life, the office staff serves as advisors on personal and related problems. Orientation programs are held at the beginning of each term, and international students are urged to attend.

The International House is located on campus, at 1515 Cumberland Ave. Provided by UTK and operated by the staff of the Center for International Education, the House is a social and recreational center where domestic and international students meet to relax and discuss matters of mutual interest. The small library at "H" House contains books and periodicals from all over the world. This University facility is open 365 days of the year. International students applying for admission should write to The Graduate School.

Ombudsman Office

Personnel of the Ombudsman Office in the University Center assist students in the resolution of problems encountered with any aspect of the University. The office is open during the regular working day and students are welcome to drop in at their convenience. Problems are treated confidentially and are dealt with expeditiously. The office does not replace existing structures but helps to ensure their responsiveness to student needs.

Graduate Research Centers and Institutes

Energy, Environment, and Resources Center

Director: E. W. Colglazier, Jr., Ph.D. California Institute of Technology

Associate Directors:
R. A. Bohn, Ph.D. Washington; L. A. Cimard, Ph.D. Tennessee.
The Energy, Environment, and Resources Center was created to encourage interdisciplinary studies at UTK, directed at solutions to problems related to energy and the environment. The Center provides assistance to faculty interested in developing research and public service projects, manages research and development projects that involve several disciplines, and assists Tennessee industries and university in specific problems related to energy and environment. It also participates in the Statewide Consumer Education Program, especially in developing materials for the program.

Current research includes environmental and human costs of coal production, utilization of energy, solar energy, energy conservation in buildings and industry, regional solid waste management, resource recovery, and energy education and information.

Transportation Center

Director: J. D. Beeson, B.S.; Emporia D. H. Jones, M. S.
Tennessee, P.E.

The Transportation Center, utilizing an interdisciplinary approach to transportation research, brings together University faculty and students in a setting conducive to the solution of problems associated with the transportation of goods and people. The Center provides support for undergraduates and graduate students, as well as faculty, in projects associated with research in the field of transportation. Such support, while providing needed financial assistance to students, enables the Transportation Center to undertake research that ultimately contributes to the solution of the nation's transportation problems.

The Center's contributions to the field and its success in meeting the challenges of contemporary transportation research are predicated on the philosophy that education and research, go hand-in-hand. In addition to education and research, the Transportation Center has played a leadership role in workshops, seminars, and short courses concerning such topics as rail and inland waterway operations, planning, engineering, and management; transportation safety, noise assessment, remote sensing, transportation planning and management; ride-sharing, transportation brokerage, traffic engineering, and operations, and other areas.

The University of Tennessee
Space Institute

Kenneth E. Harwell, Dean, Ph.D. California Institute of Technology
A. A. Mason, Associate Dean, Ph.D. Tennessee

The Space Institute is an interdisciplinary institute of graduate study and research offering academic programs leading to M.S. and Ph.D. degrees in selected areas of engineering and the aerospace and physical sciences. The Institute occupies a 365-acre lakeshore campus near Tullahoma, Tennessee, conducive to the concentrated effort needed in advanced studies. Graduate degree programs are available with majors in Aerospace Engineering, Aviation Systems, Computer Science, Electrical Engineering, Engineering Science, Industrial Engineering (engineering management option), Mathematics, Mechanical Engineering, Metallurgical Engineering, and Physics. In addition to the fundamental studies characteristic of each discipline, research opportunities are available in many aspects of atmospheric and space flight such as aerodynamics, atmospheric engineering, propulsion, flight performance, materials and structures, gas diagnostics including spectroscopic and electro-optic techniques, thermal sciences, energy conversion, remote sensing, computational fluid dynamics, microprocessors, and computer graphics. The Institute was established in part to increase the research and engineering resources of Tennessee through education and practice in relevant scientific and technical areas and in part to interface University faculty and student research with the Air Force Arnold Engineering Development Center.

The faculty, research activities, and facilities of the Institute and those available at Arnold Center through appropriate contractual arrangements provide students an unusual opportunity for significant research in these areas. Students who enroll at UTSI are admitted to The Graduate School, The University of Tennessee, Knoxville. Graduate research assistantships are available for qualified students. Further information may be obtained from the Dean, The University of Tennessee Space Institute, Tullahoma, Tennessee 37388.

Water Resources Research Center

W. F. Brandes, Director, M.S. Illinois, P. E.

The Water Resources Research Center is a federally-designated institute for the conduct of 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 programs needed by the state; (2) to promote education in fields relating to water resources and to encourage the entry of promising students into careers in these fields.

Off-campus Graduate Centers

Kingsport University Center: UTK offers at Kingsport resident graduate programs in science and engineering at both the Master's and doctoral levels. The program is operated within the policies formulated by the Graduate Council of UTK and is coordinated with the graduate and undergraduate offerings of East Tennessee State University. Students who enroll in this program must be admitted to The Graduate School of UTK.

Information and application forms may be obtained from Marvin K. Goodman, Director, Kingsport University Center, The University of Tennessee, University Boulevard, Kingsport, Tennessee 37660.

Oak Ridge Resident Graduate Program: UTK offers graduate study programs at Oak Ridge, with work leading to Master's degrees in Business Administration with a concentration in management, Industrial Education, and Statistics. The Master's and doctoral degrees are available in engineering, mathematics, and physical and biological sciences. Courses are given in the late afternoons, evenings, and Saturdays, with research facilities provided by and used in cooperation with the Oak Ridge Associated Universities (ORAU) and the Union Carbide Corporation, Nuclear Division.

This program is supported under a subcontract with ORAU with principal support coming from Union Carbide Nuclear Division. UT is one of the forty-three colleges and universities which sponsor ORAU, a nonprofit education and research management corporation.

Information and applications to the Graduate School may be obtained by writing to Director, UT-Oak Ridge Graduate School, Post Office Box 117, Oak Ridge, Tennessee 37830.

Nashville Graduate Engineering Program: Opportunities for graduate study leading to the degree of Master of Science in Industrial Engineering and other disciplines, as the need and resources permit, are offered by UTK. Students who enroll in these programs must be admitted to The Graduate School of UTK.

Information and appropriate forms may be obtained from Jerry Westbrook, Director, Nashville Graduate Engineering Program, Ninth and Charlotte, Nashville, Tennessee 37203.

Chattanooga Graduate Education Program: UTK offers a graduate program in education leading to the Specialist in Education and the Doctor of Education degrees with a major in Educational Administration and Supervision. Students who enroll in this program must be admitted to The Graduate School of UTK.

Information and appropriate forms may be obtained from the Director, c/o Dean, College of Education, UTC, Chattanooga, Tennessee 37403.

The University of Tennessee-Oak Ridge Graduate School of Biomedical Sciences: The University provides programs leading to the M.S. and Ph.D. degrees in various areas of biomedical sciences. Graduate students have the opportunity to study and do research in conjunction with the Biology Division of the Oak Ridge National Laboratory. For complete information concerning the program see page 146.

School of Social Work: UTK offers a fully accredited two-year program leading to the degree of Master of Science in Social Work through the School of Social Work, with programs in Knoxville, Nashville, and Memphis.

For complete information concerning the program see page 158.
Requirements for Advanced Degrees

Master's Degrees

Master's degree programs are available with thesis and non-thesis options. These programs require 45 or more graduate hours of course work, in addition to the M.A., and M.S. degrees, a number of other degrees are offered, including the M.A.C.T., the MBA, and the M.S.W. A complete listing is found under "Major and Degrees Available," on pages 8-9. For specific degree requirements, consult individual program descriptions listed by college and department in this Catalog. See also the chart, page 21, for a summary of procedures for the degrees.

Course Requirements: A candidate for a Master's degree must complete a minimum of 45 hours of graduate credit in courses approved by the student's Master's committee. At least one-third of the total hours in a Master's degree program must be taken at UTK in courses numbered at or above the 5000 level. Hours can be counted toward this requirement.

Master's Committee: A committee composed of the major professor and at least two faculty members at the rank of assistant professor or above should be formed as early as possible in a student's program, and must be formed by the time a student applies for admission to candidacy (refer to Advisor/Major Professor, page 14). The responsibility of this committee is to assist the student in planning a course 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: Application for admission to candidacy for the Master's degree is made as soon as possible after the student has completed any required prerequisite courses and 15 hours of graduate course work with a 3.0 average or higher in all graduate work. The student must submit the Admission to Candidacy form, with appropriate signatures, to the Office of Graduate Admissions and Records no later than commencement day of the quarter preceding the quarter in which the student plans to graduate.

Thesis Registration: A student must be registered for course 5000 each quarter during the work on the thesis, including a minimum of 3 hours the quarter in which the thesis is accepted by The Graduate School. At least 9 hours of 5000 are required for the thesis option. After receiving the Master's degree, a student is no longer permitted to register for Thesis 5000.

Final Examination for Thesis Students: A candidate presenting a thesis must pass a final oral (or oral and written) examination on all work offered for the degree. The examination, which is concerned with course work and the thesis, measures the candidate's ability to integrate material in the major and related fields, including the work presented in the thesis. This examination, scheduled through the Office of Graduate Admissions and Records, must be held at least three weeks before the date of approval and acceptance of theses by The Graduate School. Final examinations not properly scheduled must be repeated. 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. In case of failure, the candidate may not apply for reexamination until the following quarter. The result of the second examination is final. This examination represents the culmination of an original research project completed by the student. It must be prepared according to the UTK Guide to the Preparation of Theses and Dissertations. Two copies of the thesis must be approved by The Graduate School on or before the deadline specified each quarter in the Graduate School News. Each copy must include an approval sheet, signed by the members of the Master's committee, certifying that they have examined the final copy of the thesis and judged it to be satisfactory.

Non-Thesis Registration: All non-thesis students under University facilities must be registered for course 5002 if not registered for other courses. This applies to students removing incompletes from their records.

Final Examination for Non-Thesis Students: A non-thesis student must pass a final written examination on all work offered for the degree. A department may require an additional oral examination. The examination is not merely a test over course work, but a measure of the student's ability to integrate material in the major and related fields. 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 University facilities may pay a fee of $50 instead of registering. Students finishing incomplete courses, however, must register for a minimum of 3 quarter hours. In case of failure, the candidate may not apply for reexamination until the following quarter. 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 be taken within six calendar years of graduation.

Specialist in Education Degree

The Specialist in Education (Ed.S.) degree is offered in Curriculum and Instruction, Educational Administration and Supervision, Educational Psychology and Guidance, Safety Education and Service, and Vocational-Technical Education.

Admission to the Ed.S. program requires acceptance by The Graduate School, and review and acceptance by the department or area in which the student is majoring. It is recommended that students who apply for the Ed.S. have at least one year of regular work experience. Additional information on admission requirements can be obtained from the departments offering the degree. Also see the chart, page 21, for a summary of procedures for this degree. All deadlines are published quarterly in the Graduate School News.

Ed.S. Committee: A committee of at least three faculty members is designated for each student. A minimum of two members of this committee must represent the department or area of specialization. Its responsibilities include formulating the student's program of courses and work, recommending admission to candidacy, directing research, and coordinating the qualifying and final examinations.

Course Requirements: The student's program involves a minimum of 60 hours of study totaling not fewer than 90 quarter hours of graduate credit beyond the baccalaureate degree. A minimum of 9 hours is required outside the major department or area. A student admitted to the program as a Master's, or with acceptable work beyond the Master's degree, may have program requirements modified upon recommendation of the student's committee. However, no more than six hours may be permitted in examination and research requirements, nor in the minimum 9 graduate hours required outside the major. All prior course work accepted toward the degree must be related to the student's program objectives. A maximum of 9 hours beyond the Master's degree may be transferred from another institution to an Ed.S. program. See Transfer Credits, page 15.

Courses numbered at or above the 3000 and 4000 levels required for certification through UTK may not be taken for graduate credit and used as part of the course work in the major. At least one-half of the last 45 quarter hours of work (exclusive of graduate deficiencies), must be in 5000- or 6000-level courses.

Admission to Candidacy: The Admission to Candidacy form, signed by the student's committee, is submitted to the Office of Graduate Admissions and Records no later than the week before the student has completed 18 hours of course work 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.


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

b. In the thesis program, problems in lieu of thesis, or in lieu of a thesis, 9 hours of research credit (5180-90, and 5200) must be earned in the preparation of an acceptable piece of work. The student must continue to register for 5200 while working on the project, including the quarter it is accepted by The Graduate School.
thesis must be prepared according to instructions in the UTK Guide to the Preparation of Theses and Dissertations, 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 a thesis, must pass a final oral examination. The examination is not merely a test 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 date of the comprehensive examination. The request must be signed 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 quarter. The request for the examination is final.

Time Limit: Candidates have six calendar years from the time of entry into the last 45 hours of their degree programs to complete the Ed.S. degree.

Doctoral Degrees

Three doctoral degree programs are available: Doctor of Philosophy (Ph.D.), Doctor of Education (Ed.D.), and Doctor of Business Administration (DBA). Programs are listed under "Majors and Degrees Available," pages 6-9. For specific degree requirements, consult the College and Department Catalogs. The University of Tennessee Catalog contains information for all graduate degrees. The catalog is available online at graduate.utk.edu.

Doctoral programs include a major field area of specialization and, frequently, one or more collateral fields. The latter are defined as a minimum of 9 quarter hours of graduate course work in a given area outside the student's major field.

Course Requirements: Each doctoral student must take an appropriate number of courses to complete the major and related fields. Each examination is required and oral examination is final.

Time Limit: Candidates have six calendar years from the time of entry into the last 45 hours of their degree programs to complete the Ed.S. degree.

Doctoral Examination: The comprehensive examination is the last examination. It is designed to aid in the selection of courses and to determine the student's preparation to continue doctoral studies at UTK.

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

The comprehensive examination must be passed prior to admission to candidacy. 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 different times to the student. Oral examinations are required and oral examination is encouraged. Students should review carefully the written statement from each doctoral degree program which details the timing, areas covered, examination content, and procedures for repeating a failed examination.

4. A final oral examination (oral, oral and written) on the dissertation, major field, and such other fields as the student's doctoral committee may specify, 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 three weeks before the date of acceptance and approval of the dissertation by The Graduate School. The examination must be scheduled through the Graduate Office. Final examinations not properly scheduled must be repeated. The dissertation, in the form approved by the major professor, must be distributed to the department's committee at least two weeks before the examination. The examination is announced publicly and is open to all faculty members.

Language Requirements: Candidates for the Ph.D. degree may meet the language requirements by demonstrating a reading knowledge of at least one foreign language in which there exists a significant body of literature relevant to their major field of study. Refer to the descriptions of individual degrees for further details. The doctoral student will determine the specific language (or languages) required. Language requirements must be met at UTK and cannot be transferred from another institution. When the student is prepared to take A language examination, he/she should complete an Application for Doctoral Language Examination at the Office of Graduate Admissions and Records in accordance with the dates and times for the examinations printed in the Graduate School Catalog.

Satisfactory completion (grade of B or better) of a 3030 course in a language department may be substituted for a language examination.

Admission to Candidacy: A student may be admitted to candidacy for the doctoral degree after passing the comprehensive examination, fulfilling all other degree requirements (for Ph.D.), and maintaining at least a B average in all graduate course work. Admission to candidacy must be applied for and approved at least two full quarters prior to the date the dissertation is to be defended. The student's department is responsible for filing the admission to candidacy, which must be signed by the doctoral committee and approved by The Graduate School.

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 reported to the student in its final form, and must be distributed to the professor, must be approved by The Graduate School. Final examinations not approved by the Major Professor may be repeated.

Preparation of Theses and Dissertations, and instructions in the UTK Guide to the Preparation of Theses and Dissertations must be submitted to The Graduate School for final approval and acceptance. Two copies of the dissertation (prepared according to the regulations in the UTK Guide to the Preparation of Theses and Dissertations) 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 the student has examined the final copy and found that it form and content demonstrate scholarly excellence. Doctoral forms and a thesis card should be completed by the student prior to graduation.

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

### PROCEDURES

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Under Direction Of</th>
<th>Date</th>
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</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 18 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 quarter 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>
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</thead>
<tbody>
<tr>
<td>Placement of name on graduation list</td>
<td>Student</td>
<td>Indicate on registration materials</td>
</tr>
<tr>
<td>Application for diploma</td>
<td>Office of Graduate Admissions and Records</td>
<td>Deadline available at registration*</td>
</tr>
<tr>
<td>Scheduling of final examination</td>
<td>Office of Graduate Admissions and Records</td>
<td>Not later than one week prior to final examination*</td>
</tr>
<tr>
<td>Final examination(s)</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 OPTION

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Under Direction Of</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Placement of name on graduation list</td>
<td>Student</td>
<td>Indicate on registration materials</td>
</tr>
<tr>
<td>Application for diploma</td>
<td>Office of Graduate Admissions and Records</td>
<td>Deadline available at registration*</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>Office of Graduate Admissions and Records</td>
<td>Not later than one week prior to final examination*</td>
</tr>
<tr>
<td>Final examination(s)</td>
<td>Master's/Ed.S. Committee</td>
<td>Not later than three weeks prior to thesis deadline*</td>
</tr>
<tr>
<td>Approval and acceptance of thesis and thesis card</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>

*Deadlines are printed in the Graduate School News quarterly.*
# Summary of Procedures for Doctoral Degrees

## 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 16 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 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>Foreign 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 three quarters prior to graduation***</td>
</tr>
</tbody>
</table>

## GRADUATION REQUIREMENTS

<table>
<thead>
<tr>
<th>PROCEDURE</th>
<th>UNDER DIRECTION OF</th>
<th>DATE</th>
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</thead>
<tbody>
<tr>
<td>Placement of name on graduation list</td>
<td>Student</td>
<td>Indicate on registration materials</td>
</tr>
<tr>
<td>Application for diploma</td>
<td>Office of Graduate Admissions and Records</td>
<td>Deadline available at registration***</td>
</tr>
<tr>
<td>Submission of dissertation to doctoral committee</td>
<td>Student</td>
<td>At least two weeks prior to final examination</td>
</tr>
<tr>
<td>Scheduling of final examination</td>
<td>Office of Graduate Admissions and Records</td>
<td>Not later than one week prior to final examination***</td>
</tr>
<tr>
<td>Final examination(s)</td>
<td>Doctoral committee</td>
<td>Not later than three weeks prior to dissertation deadline***</td>
</tr>
<tr>
<td>Approval and acceptance of final copy of dissertation, doctoral forms, and thesis card</td>
<td>Doctoral 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>

*The order of these items varies with individual programs.

**Not required in some programs.

***Deadlines are printed in the Graduate School News quarterly.
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 three main divisions: Agricultural Experiment Station, Agricultural Extension Service, and College of Agriculture.

In 1974 the College of Veterinary Medicine was established within the Institute. The college is developing research and graduate programs in veterinary medical sciences in addition to the professional curriculum leading to the degree, Doctor of Veterinary Medicine.

Agricultural Experiment Station

D. M. Gossett, Dean
T. J. Whatley, Associate Dean
J. I. Sewell, Assistant 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 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 sixteen subject matter departments located at Knoxville. A number of the staff have teaching responsibilities in addition to their research. To assist in the research program the Station supports a large number of graduate students. To serve Tennessee's diverse agriculture, branch stations are operated at Jackson, Milan, Grand Junction, Spring Hill, Springfield, Lewisburg, Crossville, Greeneville, Martin and a forestry branch station at Oak Ridge. Professional and technical staff are in residence at these locations.

Agricultural Extension Service

M. L. Downen, Dean
T. W. Hinton, Associate Dean
M. F. Clarke, Assistant Dean
B. G. Hicks, 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 areas of activity 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.

College of Agriculture

O. Glen Hall, Dean

Graduate programs of the College of Agriculture 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. More importantly, emphasis is given to intellectual growth and to the development of scholarly habits of study, reasoning and analysis to the end 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 Agriculture. The general rules of The Graduate School apply to all graduate work in the college. 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 Engineering, Agricultural Extension, Agricultural Mechanization, Animal Science, Entomology and Plant Pathology, Food Technology and Science, 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 18 hours of course work. A complete listing of majors is shown on pages 8-9.
For admission to a graduate degree program, the student must have a satisfactory academic average and have completed the substantial requirements for an undergraduate major in his/her field of study or have completed sufficient undergraduate work in related areas to satisfy the department that he/she can successfully pursue graduate study in the chosen field. Prerequisite courses may be required when the student’s preparation does not appear to be adequate.

Each program of course work and thesis research is planned by the major professor and Master’s committee in consultation with the student and will depend upon the student’s background, interests, and professional objectives. For example, a student majoring in Entomology and Plant Pathology may pursue work with an emphasis either in the area of plant pathology or economic entomology.

Normally, graduate programs will include the thesis requirement. There is, however, a non-thesis option in the Department of Agricultural Economics and Rural Sociology and the Department of Forestry, Wildlife and Fisheries.

The non-thesis option with a major in Agricultural Economics has the following minimum requirements:

1. 48 hours of course work of which 32 hours must be at the 5000-level or above.
2. 18 hours in agricultural economics.
3. 9 hours of economic theory.
4. 6 hours in quantitative methods in agricultural economics, statistics, or mathematical economics.

5. Final comprehensive written and oral examination.

Requirements of the non-thesis option for the Master of Science degree with a major in Forestry are as follows:

1. 50 hours of course work of which 34 hours must be at the 5000 level or above.
2. An advisory committee of not less than 3 faculty members will be selected. At least one member in addition to the major professor will be from the Department of Forestry, Wildlife and Fisheries. The committee will meet and schedule the student’s program during the first quarter in residence.
3. Forestry 5011 (3).
4. 12 hours of course work in the Department of Forestry, Wildlife and Fisheries at the 5000 level or above, exclusive of Forestry 5011.
5. Final comprehensive written and oral examination.

DOCTORAL PROGRAMS

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

General Graduate School requirements relative to admission, faculty advisory committees, residence, grades, research, and admission to candidacy for degree apply to all doctoral programs. In addition, the College of Agriculture requires:

1. Minimum of 108 quarter hours credit beyond the Bachelor’s degree, exclusive of the credit for the Master’s thesis. Of this number, students are required to complete a minimum of 36 quarter hours in 6000 Doctoral Research and Dissertation.
2. A minimum of 30 quarter hours credit will be in courses numbered 5000 and 6000, exclusive of Doctoral Research and Dissertation.

The specific program of a candidate for the Doctor of Philosophy degree in the College of Agriculture will depend upon the interest and previous training of the candidate. Each candidate will be under the immediate supervision of a faculty advisory committee in planning his/her program. The major professor will serve as chairperson of the faculty advisory committee and will direct the research and preparation of the dissertation. Special departmental requirements are listed in the following paragraphs.

Agricultural Economics and Rural Sociology

Subject Area Requirements: All candidates pursuing the Doctor of Philosophy degree will be required to demonstrate competence in examinations in the following areas:

A. Major area of concentration to be selected from the following:
1. Agricultural policy
2. Agricultural marketing and price analysis
3. Farm management and production economics
4. Natural resource economics
5. Rural development

B. The core areas:
1. Agricultural economics
2. Economic theory
3. Mathematical and quantitative methods in agricultural economics

Additional Course Requirements: At least 30 hours of course work shall be in agricultural economics and 15 hours in economics. Excluding the dissertation, a minimum of 21 hours in agricultural economics and 36 hours in agricultural economics and economics combined must be in courses numbered 5000 and above.

Agricultural Engineering

Concentrations:
1. Agricultural power and machinery
2. Soil and water conservation engineering
3. Agricultural structures
4. Electric power and processing

Supporting studies are required in related biological, physical, and engineering sciences and mathematics fundamental to the training of the candidate.

Additional Course Requirements: The program of each candidate shall consist of a major and supporting studies in one or more additional areas. The major shall consist of a minimum of 24 quarter hours exclusive of research and dissertation. A minimum of 24 quarter hours shall be taken in departments outside of the Department of Agricultural Engineering.

Animal Science

Concentrations:
1. Animal nutrition
2. Animal breeding
3. Animal physiology

Supporting studies are required in related biological and physical sciences fundamental to the training of the candidate.

Additional Course Requirements: A minimum of 24 quarter hours credit must be completed in related fields outside of animal science.

2. At least 36 quarter hours credit in courses at the 5000 and 6000 level, exclusive of Doctoral Research and Dissertation. At least 9 of the 36 hours must be in 6000-level courses.

Food Technology and Science

Concentrations:
1. Food products
2. Food chemistry
3. Food microbiology

Supporting studies will be required to provide fundamental training in sciences related to the student’s specialized area. Various commodity interests can be emphasized in all three areas by judicious selection of courses and dissertation topics.

Additional Course Requirements:
1. At least 36 quarter hours credit in courses at the 5000 and 6000 level, exclusive of Doctoral Research and Dissertation. At least 9 of the 36 hours must be in 6000-level courses.
2. A minimum of 9 hours of courses for graduate credit outside of the Department of Food Technology and Science.

Plant and Soil Science

Concentrations:
1. Soils
2. Plant breeding and genetics
3. Crop physiology and ecology

Supporting studies are required in related sciences fundamental to the training of the candidate.

Additional Course Requirements: A minimum of 30 quarter hours credit must be completed in courses numbered above 5000 exclusive of Doctoral Research and Dissertation, of which 9 must be in courses numbered above 6000.

Departments of Instruction

Agricultural Economics and Rural Sociology

MAJOR DEGREES

Agricultural Economics

M.S., Ph.D.

Professors:
J. A. Martin (Head), Ph.D. Minnesota; M. B. Badenhop, Ph.D. Purdue; J. R. Brooker, Ph.D. Florida; C. L. Gieland, Ph.D. Wisconsin; S. Dubov, Ph.D. California (Berkeley); L. H. Keller, Ph.D. Kentucky; T. H. Klimsch, Ph.D. Kentucky; F. O. Leuthold, Ph.D. Wisconsin; D. L. McMenemy, Ph.D. Clemson, B. R. McManus, Ph.D. Purdue; S. D. Mundy, Ph.D. Tennessee; C. B. Sappington, Ph.D. Illinois.

Associate Professors:

Assistant Professors:
W. M. Park, Ph.D. Virginia Polytechnic Institute; G. D. Whipple, Ph.D. Washington State.

The Department has programs for the Doctor of Philosophy degree and the Master of Science degree with a thesis or non-thesis option.
Agricultural Economics

4120 Farm Management (3) Principles of farm organization and operation; nature of managerial processes; economic aspects of crop, livestock, labor, and machinery planning; use of budgeting techniques. Prerequisites: Agriculture 1110 and Economics 2120. 2 hrs and 1 lab. F, W

4140 Agricultural Production Economics I (3) Application of microeconomic theory to problems of resource allocation, product selection, scale of operation of agricultural firms; economic interpretation of technical agricultural production relationships. Prerequisites: Agriculture 1110 and Economics 2120. W

4240 World Agriculture and Trade (3) Economic bases of world agricultural production and trade; resource location, land tenure systems, international trade and commercial policy. Prerequisite: Agriculture 1110 and Economics 2120, or consent of instructor. F

4250 Agricultural and Rural Planning (3) Decision-making concepts applied to design and implementation of local action programs. Case examples from the U.S. and other countries. Prerequisite: Agriculture 1110 and Economics 2120, or consent of instructor. Su

4310 Agricultural Finance (3) Nature and source of capital; credit problems of farmers; kinds and sources of farm credit. Agricultural insurance and taxation. Prerequisite: Agriculture 1110 and Economics 2120. W

4320 Agricultural Policy (3) Meaning of agricultural policy in democratic society; relationship of farm groups to government organizations giving to policy; agricultural policy and appraisal of results; policy problems. Prerequisite: Agriculture 1110 and Economics 2120. W

4330 Land Economics (3) Problems and policies of land use, conservation, tenure, taxation, tenure, population growth and demand for land; principles and theories of rent, property value, and income. Prerequisite: Agriculture 1110 and Economics 2120. Sp

4610 Management of Farm Supply and Marketing Firms (3) Operations of firms selling farm supplies and merchandising agricultural products. Emphasis on accounting data and economic theories for decision making. Prerequisite: Agriculture 1110 and Economics 2120. F

4630 Advanced Agricultural Marketing (3) Economic analysis of market location and pricing; perfect market model; spatial equilibrium analysis; production and market location and transfer costs; processing and storage factors, institutional and market flows; measuring efficiency. Prerequisite: 3120 or 3320 or consent of instructor. W

5000 Thesis (1-15) P/NP only. E

5002 Non-Thesis Graduation Completion (3-15) Required for the non-thesis student not otherwise registered during any quarter when such a 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

5130 Agricultural Production Economics II (3) Theoretical and empirical concepts of agricultural allocation problems under various knowledge situations with emphasis on uncertainty. Aggregate external effects of decisions by made by individual agriculture firms. Decision theory with application to agriculture. Prerequisite: 4140 or equivalent. F

5210 Seminar: Agricultural Policy (3) Sp

5220 Research Methodology (3) Nature of scientific food, logic, philosophy, assumptions, potential and limitations of science; methodological problems of social sciences. Establishing research problems in agricultural economics. Prerequisite: 4130. F

5310 Research (3) Special research problems in agricultural economics and rural sociology. Gathering, tabulating and interpreting data and report writing. May be repeated, Maximum 9 hrs. S/N only. E

5410 Agricultural Marketing Analysis (3) Analysis of structure, conduct, and performance of agricultural marketing system; application of price theory concepts to marketing situations; methods used to examine industry conduct and performance. Prerequisite: Economics 3110 or consent of instructor.

5420 Advanced Land and Natural Resource Economics (3) Economic efficiency in natural resource allocation with land. Use of economic theory for evaluation. Prerequisite: 4330 and Economics 5110, or consent of instructor.

5440 Economics of Agricultural Development (3) Role of agriculture in overall economic development; impacts of world food situation on people, environment, development; natural and human resources for food production; environmental change and national and international food policy. Prerequisite: 4240 or consent of instructor. W

5610 Quantitative Methods in Agricultural Economics (3) Analytical techniques useful in estimation of functions—supply, demand and production and prediction of economic variables. Emphasis on application of multiple regression; model specification, estimation technique using computer and interpretation of results. Prerequisite: Statistics 4310 or Economics 5510 or consent of instructor. W

5710 Linear Programming (3) Techniques with applications. Solution of systems of linear equations; maximizing, minimizing, profit, minimizing costs, transfer, transportation, allocation over space and time. Prerequisite: Consent of instructor. W

5820 Agricultural Price Analysis (3) Application of various econometric methods to analysis of price determination; specification and estimation of price determination models and interpretation of results. Prerequisite: 3120 and 5610 or Statistics 4310 or consent of instructor.

6000 Doctoral Research and Dissertation (3-15) P/NP only. E

6120 Seminar in Agricultural Economics (3) Topics selected from the areas of economics of production, consumption, distribution in agriculture and related industries and public policies concerned with agriculture and related industries. A

6210 Agricultural and Rural Transformation Problems (3) Systematic evaluation of policy and development proposals related to agricultural modernization, food supply, and rural living. Decision-making process and useful roles of social scientists. Analysis of current issues in U.S. and developing nations. Prerequisite: Consent of instructor. Sp

6410 Agricultural Supply Analysis (3) Estimating agricultural supply relationships using aggregate time series data. Regression estimation, simulation and firm growth models with emphasis on the difference between theoretical concepts and model attributes. Prerequisite: 5130 or consent of instructor. A

6420 Marketing and Resource Use (3) Institutional settings for research and policy formulation; analytical tools to measure efficiencies of marketing and resource use; emerging problems in marketing and resource use. Prerequisite: 5410 or consent of instructor. A

Rural Sociology

3420 Rural Sociology (3) Nature of rural society; social systems concept; rural-urban differences; nature of social relations; population characteristics and movement; problems of rural people; tenancy, farm labor, health, services, educational facilities, churches, local government; impact of industrialization. F, W

4450 Diffusion of Agricultural Technology (3) Analysis of diffusion process whereby new technological advancement spreads from scientists to final adopters. Adoption process, communication behavior, mass media, role of professional change agents, opinion leadership, and innovation hypothesis. Prerequisite: 3420 or consent of instructor.

5340 Special Problems (3) Special topics in rural sociology. Prerequisite: 3420 or consent of instructor. May be repeated. Maximum 9 hrs. S/N only. E

5430 Seminar in Rural Sociology (3) Current rural sociological literature and research; relevance of general sociological theory and methodological techniques. Prerequisite: 3420 or equivalent. A

5450 Advanced Rural Sociology (3) Application of sociological concepts to analyze change and structure and function of rural life; rural social values, attitudes, and norms as they influence the family, formal and informal organization and population shifts in changing farm technology. Prerequisite: 3420 or equivalent. W

5470 Research Problems in Rural Communities (3) Emphasis on problems that arise in survey research in rural areas. Sampling procedures, questionnaire construction, interviewer selection, training, control, and legitimization needs. Prerequisite: Undergraduate course in statistics.

5490 Rural Population Analysis (3) Analysis of U.S. and world population changes and determinants of fertility, migration, and mobility with emphasis upon changes in rural sector. Prerequisite: Sociology 4110 or equivalent. F

Agricultural Engineering

DEGREES

MAJORS

Agricultural Engineering

Undergraduate course in statistics.

4230 Selected Topics in Agricultural Engineering (3) Develop new topics as required by current trends and problems in agricultural engineering. A

4610 Design of Water Control and Waste Utilization Systems (3) Earth dams, irrigation, drainage, land grading, hydraulic transport of wastes, and ap-}
5410 Agronomic Machinery Systems Analysis (3) Analysis of current field machinery; adaptation planning for sequential operations; machinery for under-row and above-row production, and harvesting systems; operational management. Prereq: 4210. 2 hrs and 1 lab. Sp.

5510 Selected Topics in Agricultural Mechanization (3) Lecture, group discussion, and individual study on specialized agricultural mechanization developments. May be repeated. Maximum 9 hrs. F

5610 Selected Topics in Agricultural Extension (3) Lecture, group discussion, and individual study on specialized agricultural mechanization developments. May be repeated. Maximum 9 hrs. F

5640 Research Problems in Agricultural Engineering (3) Theoretical and experimental studies relating to current problems in agricultural engineering. May be repeated. Maximum 9 hrs. E

5710-20 Similarities in Design and Research (3, 3) Dimensional analysis in development of models; theory and types of models, prediction equations; interpretation of data; applications to machinery, soil and water structures, agricultural buildings, and other agricultural engineering-related problems. Prereq: Engineering Science and Mechanics 3110 and 3310. 2 hrs and 1 lab. F; W; A

6000 Doctoral Research and Dissertation (3-18) P/NP only. E

6110 Seminar (1) Current research and literature related to engineering in agriculture. May be repeated. Maximum 3 hrs. E

6310 Engineering Systems Analysis in Agriculture (3) Systems approach to design of engineering experiments and applications to include linear programming, computer applications, statistical evaluations, and feedback control in agricultural problems. Prereq: Mathematics 4550 or 4710. Coreq: 5710 or equivalent. 2 hrs and 1 lab. F

6610 Selected Topics in Agricultural Engineering (3) Lecture, group discussion, and individual study on specialized developments in power and machinery, soil and water, structures, and processing. May be repeated. Maximum 9 hrs. F

Agricultural Mechanization

4160 Agricultural Waste Utilization and Disposal (3) Techniques, equipment, and structures for utilizing, treating, and disposing of agricultural wastes by landfilling, lagooning, and processing. 2 hrs and 1 lab. F

4170 Small Engines (3) Concepts and mechanics of small gasoline engines; selection, operation, adjustment, and repair of single cylinder engines. 2 hrs and 1 lab. W

4180 Equipment and Techniques for Application of Agricultural Chemicals (3) Equipment for application of liquid, solid, and gaseous chemicals; system components: operational characteristics; safety considerations; calibration; selection and management; materials handling and disposal methods. 2 hrs and 1 lab. F

4210 Agricultural Machinery and Tractors (4) Agricultural machinery and power units; adaptation to agricultural practices; field efficiencies, capacities; adjustment and servicing. Prereq: Mathematics 1650. 3 hrs and 1 lab. W

5000 Thesis (1-15) P/NP only. E

5100 Special Problems in Agricultural Extension (1-5) May be repeated. Maximum 9 hrs. E

5210 Long-range Extension Program Planning (3) Development of county extension program based on effective interpretation of physical, social, economic characteristics of areas. Prereq: 3110 or consent of instructor. F

5220 Seminar (3) Review of literature and developments in agricultural extension methods. Prereq: 3110 or consent of instructor. Sp

5230 Evaluation in Programs of Agricultural Extension (3) Principles, instruments, and techniques of effective leadership in small groups in rural communities through agricultural extension programs. Prereq: Microbiology 3510 and 3520. 2 hrs and 1 lab. F; W; A

Animal Science

MAJOR

Animal Science

DEGREES

M.S., Ph.D.

Professors:

D. O. Richardson, (Head), Ph.D. Ohio State;
K. W. Berth, Ph.D. Purdue; K. C. Bell, Ph.D. Oklahoma State; J. K. Blevin (Emeritus), Ph.D. Ohio State; T. W. Butts, (Adjunct), Ph.D. Tennessee;
C. C. Chamberlin (Emeritus), Ph.D. Michigan;
B. H. Erickson, Ph.D. Kansas State; O. G. Hall (Dean), Ph.D. Iowa State; S. L. Hansard (Emeritus), Ph.D. Florida; E. R. Lidvall, M.S. Tennessee;
L. B. McLean, Ph.D. Auburn; G. M. Merriman (Emeritus), Ph.D. Michigan; D. M. Michigan;
D. A. Miller, Ph.D. Georgia; D. M. Montgomery, Ph.D. Wisconsin;
R. L. Murphy (Emeritus), Ph.D. California;
H. V. Shirley, Ph.D. Illinois; R. R. Shroyer, Ph.D. Iowa State; R. L. Tjugwell (Emeritus), Ph.D. Kansas State;
C. E. Wyle (Emeritus), A.M. Missour.

Associate Professors:

W. R. Backus, Ph.D. Tennessee; H. Eiler, D.V.M., Ph.D. Illinois; R. W. Henry, Ph.D. Ohio; J. P. Hitchcock, Ph.D. Michigan State;
F. B. Massie, Ph.D. Iowa State;
K. R. Robbins, Ph.D. Illinois; M. Sims, Ph.D. Auburn.

Assistant Professors:

B. R. Bell, Ph.D. North Carolina State; W. C. Cullen, Ph.D. Minnesota; J. D. Godkin, Ph.D. Iowa;
D. Massachusetts; R. M. Heffmann, Ph.D. Maine;
H. G. Kattles, Ph.D. Virginia Polytechnic Institute;
T. W. Schultz, Ph.D. North Dakota State; J. D. Smailing,
Ph.D. Texas A. & M.

3210 Anatomy and Physiology of Farm Animals (4) Skeletal and joints, skeletal muscles, blood and microcirculation, and the nervous, cardiovascular, respiratory, digestive, renal and endocrine systems, demonstrations of physicochemical phenomena. Prereq: Biology 1210 or Agriculture 1130. 3 hrs and 1 lab. F; W, Sp

3220 Physiology of Reproduction (3) Comparative anatomy and physiology of reproductive systems of higher vertebrates; gametogenesis, fertilization, implantation, prenatal growth, parturition and initiation of lactation; endocrine regulation of reproductive phenomena. Prereq: 3210 or consent of instructor.

(Same as Zoology 3220) 2 hrs and 1 lab. F; W, Sp

3230 Animal Nutrition (3) Properties, functions, utilization and deficiency symptoms of essential nutrients; nutritive value determinations and their use. Prereq: Agriculture 1130 and one quarter of organic chemistry. F, W, Su

3330 Feeds and Ration Formulation (4) Feedstuffs, additives, feeding standards, nutrient requirements and rations formulation for beef and dairy cattle, sheep, horses, swine, poultry, and laboratory animals. Prereq: 3320, 2 hrs and 2 labs. W, Sp

3410 Heredity in Animals (3) Basic chromosomal mechanism of heredity with emphasis on Mendelian principles and exceptions such as linkage and co-dominance, chromosomal inheritance, genetics of eukaryotic inheritance, introductions to the biochemical basis of heredity and to quantitative inheritance. Prereq: Introduction to animal genetics. 2 hrs and 1 lab. F, W, Sp

3420 Principles of Animal Breeding (3) Genetic principles in the breeding of economic species. Genetic basis of variation. Partitioning of variation according to various kinds of causative differences such as those in general and specific environment. Selection and its consequences. Mating systems and their effects on populations. Prereq: Introduction to animal genetics. 4 hrs and 2 labs. F, W, Sp

3510 Animal Hygiene and Sanitation (4) Parasitic, viral and bacterial organisms in farm animals, immunization; control and protection against disease; veterinary regulations and quarantine; herd health programs. Prereq: Microbiology 2910-11 or 2910-19 or consent of instructor. 3 hrs and 1 lab. F; W, Sp

3520 Avian Diseases (3) Major diseases; characteristics, prevention and treatment, management practices and systems for domestic birds, upland game birds, and waterfowl. 2 hrs and 1 lab. F, A

5000 Thesis (1-15) P/NP only. E

5100 Special Problems in Agricultural Extension (1-5) May be repeated. Maximum 9 hrs. E

5210 Long-range Extension Program Planning (3) Development of county extension program based on effective interpretation of physical, social, economic characteristics of areas. Prereq: 3110 or consent of instructor. F

5220 Seminar (3) Review of literature and developments in agricultural extension methods. Prereq: 3110 or consent of instructor. Sp

5230 Evaluation in Programs of Agricultural Extension (3) Principles, instruments, and techniques of effective leadership in small groups in rural communities through agricultural extension programs. Prereq: Microbiology 3510 and 3520. 2 hrs and 1 lab. F; W; A

5310 History, Philosophy and Objectives (3) Historical and philosophical foundation of informal adult education in America and in agricultural societies (1785 to present). Key figures, issues, legislative movements, farmer organizations and programs. Historical and philosophical foundations of agricultural extension service, its origin, legislation and growth and nature of present day objectives and programs. Prereq: 3110 or consent of instructor. W

5320 Volunteer Leadership in Agricultural Extension Programs (3) Theory, principles and procedures in development of volunteer leadership for small groups in rural communities through agricultural extension programs. Emphasis on analysis of place and importance of volunteer leadership function, techniques of effective leadership in small groups and methods of developing volunteer leadership in agricultural extension work. Prereq: 3110 or consent of instructor. W

5330 Supervision of Agricultural Extension Programs and Personnel (3) Theories of human effectiveness; principles of successful supervision applied to various county, district, and other extension programs, and planning for effective office management. Prereq: 5520 or 5522 or consent of instructor. W

Agriculture

5210 Teaching Internship in Agriculture (1) Supervised experience in teaching, test preparation, and evaluation of agriculture students. May be repeated. Maximum 3 hrs for M.S. students; 6 hrs for Ph.D. students.
3810 Nutrition and Management of Laboratory Animals (3) Principles of feeding, breeding, and handling of animals in scientific investigations; specific species; requirements, peculiarities, and rearing methods which best fit; laws governing use and handling of laboratory animals. Prereq: Agriculture 1130 and consent of instructor. 2 hrs and 1 lab. W

4210 Physiology of Lactation (3) Development, anatomy, and function of mammary glands; endocrine interactions for mammary development and milk secretion; factors affecting yield and composition of milk. Prereq: 3210. W

4220 Avian Physiology (3) Anatomy and physiology of avian species with emphasis on poultry. Prereq: 3210. 2 hrs and 1 lab. Sp

4230 Applied Reproduction in Farm Animals (3) Application of methods and techniques in collecting, evaluating, processing, and preserving semen; insemination of females; pregnancy determination; gestation and parturition. Male and female infertility. Prereq: 3220 and consent of instructor. 1 hr and 2 labs. F, Sp

4330 Feeding Applications for Farm Animals (3) Detailed application of feeding principles designed to allow student to discover and explore feeding options available to producers through problem solving. Prereq: 3330. 1 hr and 2 labs. Sp

4340 Experimental Animal Nutrition Laboratory (2) Laboratory feeding trials to demonstrate basic animal nutrition: feeding preparation and feeding of experimental diets. Prereq: 3330. W

4810 Beef Cattle Production and Management (4) Principles of nutrition, physiology, and breeding in a complete beef cattle management program. Structure of industry, enterprise establishment, systems of production, production practices and herd improvement programs. Alternatives in terms of production response and economic returns. Prereq: Completion of animal science sophomore and junior core courses or consent of instructor. 3 hrs and 1 lab. F, Sp

4820 Dairy Cattle Production and Management (4) Principles of nutrition, physiology and breeding in a complete dairy cattle management program. Structure of industry, enterprise establishment, systems of production, production practices, and herd improvement programs. Alternatives in terms of production responses and economic returns. Prereq: Completion of animal science sophomore and junior core courses or consent of instructor. 3 hrs and 1 lab. F, W

4830 Pork Production and Management (4) Integration of principles of nutrition, physiology and breeding into a complete pork production and management program. Structure of industry, enterprise establishment, systems of production, production practices and herd improvement programs. Alternatives in terms of production responses and economic returns. Prereq: Completion of animal science sophomore and junior core courses or consent of instructor. 3 hrs and 1 lab. F, Sp

4840 Poultry Production and Management (4) Structure of poultry industry, organization and management of poultry enterprises including rearing, housing, feeding, processing and marketing. Prereq: Completion of animal science sophomore and junior core courses or consent of instructor. 3 hrs and 1 lab. F, Sp

4850 Light Horse Production and Management (4) Integration of principles of nutrition, physiology and breeding into light horse management program. Structure of industry, systems and practices of production, individual animal and herd improvement programs; tack, equipment and facilities for both pleasure owners and commercial producers. Alternatives in terms of pleasure, recreation and economic returns. Prereq: Completion of animal science sophomore and junior core courses or consent of instructor. 3 hrs and 1 lab. Sp

4860 Lamb and Wool Production and Management (4) Integration of principles and selection, nutrition, breeding, physiology and marketing into complete lamb and wool production and management program. Structure of industry, enterprise establishment, systems of production responses and herd improvement programs; factors affecting yield and composition of milk. Prereq: 3210. W

5000 Thesis (1-15) P/NP only. E

5011 Problems in Lieue of Thesis (1-6) May be repeated. Maximum of 6 hrs. E

5110 Special Problems in Animal Science (1-6) May be repeated. Maximum 3 hrs. E

5210 Endocrine Relations in Animal Production (4) Endocrine glands related to growth and reproduction; hormone preparation for altering growth and reproductive rate. Prereq: 3210 or consent of instructor. 2 hrs and 1 lab. W, A

5230 Advances in Mammalian Reproduction (3) Germ cell development, maturation, transport metabolism, and preservation; fertilization and embryonic mortality. Prereq: 3220 or 4230. 2 hrs and 1 lab. W, A

5240 Advanced Studies of the Secretion of Milk (3) Effect of endocrine and nutritional factors on mammary gland development; initiation and maintenance of lactation. Prereq: 4210. 2 hrs and 1 lab. Sp, A

5311 Analytical Techniques in Animal Nutrition (3) Physical and chemical analyses of feeds, ingredients and biological fluids associated with nutrition research. Prereq: 3220. 4 hrs and 1 lab. W

5322 Advanced Experimental Animal Nutrition (3) Animal experimental techniques for digestion, absorption, nutrient balances and radiosotope tracer techniques. Prereq: 5311. 1 hr and 2 labs. Sp

5333 Nonruminant Animal Nutrition (4) Physiological digestion and systemic digestion in a system of nonruminant animal during the life cycle. Concepts and methodology concerning nutrient requirements, interrelationships, availability and deficiencies of nutrients. Nonnutritive additives, toxins, poisons, and disease effects, nutritional effects on products. Prereq: 3210, 3330 or consent of instructor. 3 hrs and 1 lab. W

5344 Ruminant Animal Nutrition (3) Digestive physiology of the ruminant stomach, rumen fermentation, determination of nutrient requirements, and feed intake regulations of ruminant animals. Prereq: 3330. F

5410 Genetics of Animal Populations (3) Population and individual, gene and zygotic frequencies; statistical descriptions of populations; forces influencing genetic changes; application to animal breeding. Prereq: 3420 or consent of instructor. 2 hrs and 1 lab. F, A

5510-20 Advanced Animal Physiology (5, 5) Advanced animal physiology (primarily mammalian physiology): 5510—Membrane neuron, central nervous system and cardiovascular system; control mechanisms. 5520—Respiratory, renal, gastrointestinal and reproductive physiology, acid base mechanisms, and metabolism. Should be taken in sequence if both courses are taken. Prereq: General undergraduate anatomy and physiology and Biochemistry 4110 or equivalent or consent of instructor. Biochemistry 4120 also recommended. (Same as Zoology 5510-20). 4 hrs and 1 lab. W, Sp

5710 Methods of Evaluating Experimental Data in Animal Science (3) Interpretation of data from experiments in animal science based upon such statistical procedures as analysis of variance, covariance, linear regression and correlation and multiple linear regression. Prereq: Statistics 2211 or equivalent, 2 hrs and 1 lab. W

5720 Design and Interpretation of Experiments in Animal Science (3) Review of principles of experimental design and application to research in animal science analyzing data from experiments with unequal and disproportionate subclass frequencies; situations and procedures for use of computers in statistical analyses. Prereq: 5710. 2 hrs and 1 lab. Sp

5910 Seminar (1) Current developments and literature in animal sciences. May be repeated. Maximum 3 hrs. F, W, Sp

6000 Doctoral Research and Dissertation (3-15) P

6211 Advanced Topics in Animal Physiology (1-6) Recent advances and concepts, research techniques, current problems. May be repeated. Maximum 6 hrs. E

6220 Environmental Physiology of Farm Animals (3) Environmental factors and measurement, physiological mechanisms of response to environmental factors and measurement, interrelationship of animal and environment in terms of productivity and health. Prereq: Consent of instructor. 2 hrs and 1 lab. W, A

6230 Animal Growth and Development (3) Physiological and nutritional aspects of growth of farm animals; effects of growth rates on physiological and productive functions. Prereq: 5344, 5510, 5520 or consent of instructor. Sp

6240 Physiology of the Heart (4) Cardiac physiology: ultrastructural, biochemical, and physical effects. Latest techniques to assess myocardial function. Prereq: 5510-20, and upper division course in cell physiology and consent of instructor. 3 hrs and 1 lab.

6311 Advanced Topics in Animal Nutrition (1-6) Recent advances and concepts, research techniques, current problems. May be repeated. Maximum 6 hrs. E

6322 Advanced Animal Nutrition (3) Chemical forms, digestion, absorption, intermediary metabolism, deficiencies, excesses and interaction of nutrients, energy, proteins; vitamins, and minerals. Prereq: 5333 or 5344; and Biochemistry 4120 or Nutrition 5110; or consent of instructor. May be repeated. Maximum 3 hrs. W, F, Sp

6411 Advanced Topics in Animal Breeding (1-6) Recent advances and concepts, research techniques, current problems. May be repeated. Maximum 6 hrs. E

6420 Animal Breeding Research Methods and Interpretation (3) Obtaining valid estimates of genetic parameters in animal breeding studies, least squares adjustment of data; partition of variance, phenotypic, genetic and environmental correlations; repeatability; heritability; and selection indexes. Prereq: 5410 and 5710. W, A

6510 Seminar (1) Animal nutrition, breeding, physiology and products. May be repeated. Maximum 6 hrs. E

Entomology and Plant Pathology

MAJOR DEGREE

Entomology and Plant Pathology M.S.

Professors:
C. J. Southard (Head), Ph.D. North Carolina State; R. R. Gerhardt, Ph.D. North Carolina State; J. W. Hilly, Ph.D. Ohio State; J. F. Johnston, Ph.D. Louisiana State; C. D. Pliss, Ph.D. Clemson

Associate Professors:
E. C. Bernard, Ph.D. Georgia; P. L. Lambdin, Ph.D. Virginia Polytechnic Institute.

Assistant Professors:
L. E. Klestermyer, Ph.D. Nebraska; B. B. Reddick, Ph.D. Clemson

610 Biology of Soil Microorganisms (4) Morphology and physiology of microorganisms; decomposition of organic matter, chemical transformations and interactions between soil organisms and higher plants. Prereq: Introductory microbiology or 3130. 3 hrs and 1 lab. Sp, A

4610 Forest and Shade Tree Entomology (3) Identification, biology, ecology, and control of forest and shade tree pests. Prereq: 3210 or equivalent. 2 hrs and 1 lab. W, A

4140 Forest Pathology (3) Symptomatology, etiology, epidemiology, and control of forest tree diseases, including wood decay and other diseases important to urban and production forestry. Prereq: 3210 or Forestry 3060. 2 hrs and 1 lab.
5000 Thesis (1-15) P/NP only. E
5010 Research Methods and Instrumentation in Plant Pathology and Entomology (3) Techniques for research in plant pathology and entomology. 1 hr and 2 labs. F
5110 Plant Disease Diagnosis (3) Diagnosis of plant diseases, disease symptoms, causal agents and control measure. Prereq: 3130.
5120 Insect Diagnostic Clinic (3) Identification of insects and insect damage to crops, livestock and residences. Obtaining of insects and damaged specimens; diagnostic characteristics and control measures. Prereq: 3210 or Zoology 3110.
5210 Plant Parasitic Nematodes (4) Morphology, physiology, taxonomy, and ecology of plant parasitic nematodes with emphasis on host-parasite relationships. Prereq: 5 hrs biological science or consent of instructor. (Same as Zoology 5210.) 2 hrs and 2 labs. W, A
5220 Plant Disease Control (3) Basic problems and principles involved in controlling plant diseases. Prereq: 3130. W, A
5230 Field Crop and Vegetable Insects (3) Taxonomic and economic study of insects affecting field crops, vegetable crops, and greenhouse crops. Prereq: 3210 or equivalent in applied entomology. 2 hrs and 1 lab. F, A
5240 Plant Virology (4) Symptomatology, virology, and viroidology. Prereq: 3130 or consent of instructor. 2 hrs and 2 labs. W, A
5250 Medical and Veterinary Entomology (4) Morphology, taxonomy, biology and control of arthropod parasites and vectors of pathogens of humans and animals. Ecology and behavior of vectors in relation to pathogen transmission and control. Prereq: 3210, general entomology, or consent of instructor. 3 hrs and 1 lab. Sp, A
5260 Insect Pest Management (4) Principles and applications of biological, cultural, genetic, behavioral, and chemical methods of control to maintain pest populations below economic threshold levels. Prereq: 3210, Zoology 3110, or consent of instructor. 3 hrs and 1 lab. W, A
5310 Special Problems in Entomology (1-6) Comprehensive individual study of current problems. May be repeated. Maximum 9 hrs. E
5320 Special Problems in Plant Pathology (1-6) Comprehensive individual study of current problems. May be repeated. Maximum 9 hrs. E
5330 Special Problems in Nematology (1-6) Comprehensive individual study of current problems. May be repeated. Maximum 9 hrs. E
5410 Seminar (1) Review of literature and current research in plant pathology and economic entomology. May be repeated. Maximum 3 hrs. F, W, Sp

Food Technology and Science

MAJOR DEGREES M.S., Ph.D.


3200 Dairy Products I (4) Procurement, processing and distribution of manufactured from raw and condensed dairy products. 3 hrs and 1 lab. W
3840 Meat Science (3) Processing methods, carcass characteristics of meat animals, slaughter, cutting, selection, curing, freezing and cookery. 2 hrs and 1 lab. W, Sp
4030 Dairy Products II (4) Principles in the manufacture of butter and special dairy products. Prereq: 3000. 3 hrs and 1 lab. Sp, A
4130 Food Chemistry I (3) Minerals, fats, oils and vitamins in food as affected by processing and storage. Prereq: Nutrition and Food Sciences 3150 or equivalent. 2 hrs and 1 lab. Sp
4140 Food Chemistry II (3) Reactions of proteins, carbohydrates and natural food colorants in food materials. Protein structure, food enzymology and browning reactions. Effects of storage and processing on proteins and carbohydrates with emphasis on nutritional value and functionality. Prereq: Nutrition and Food Sciences 3150 or equivalent. 2 hrs and 1 lab. F
4200 Food Processing I (4) Prevention of spoilage and deterioration of foods. Methods of preservation. Prereq: Agricultural Mechanization 3510. 3 hrs and 1 lab.
4220 Food Additives (3) Substances used in food manufacturing with emphasis on properties and functions. Prereq: Nutrition and Food Sciences 3140 or equivalent. 2 hrs and 1 lab. Sp
4310 Food Packaging (3) Characteristics and applications of materials and containers to packaging requirements and methods of packaging foods. Prereq: 3200. 2 hrs and 1 lab. Sp
4400 Food Processing II (5) Design of food quality assurance programs with emphasis on sanitation. Application of general analytical techniques, regulations and unit operations to quality control in food industry. Prereq: 3810. 3 hrs and 2 labs. W
4410 Food Crop Products (3) Food products from crops with emphasis on types, manufacturing systems, quality attributes, and utility. Sp, A
4420 Bakery Products (3) Baking ingredients and their interactions during production and storage of bakery products. Prereq: 4130 and Chemistry 2230 or equivalents. 2 hrs and 1 lab. Sp, A
4810 Food Microbiology I (2) Standard methods for examination, cultivation, and identification of bacteria associated with food spoilage, food poisoning. Prereq: 3810. 2 hrs and 2 labs. F
4840 Meat Products Manufacturing (3) Prepared meat products with emphasis on sausage making and information relating to cost controls, inspection, and meat science. Prereq: 3840 or consent of instructor. 1 hr and 2 labs. W
4920 Analysis of Physical Properties of Foods (4) Physical states of food materials, water, viscosity, colloids, gels, foams, crystals, color. Quantitation and changes induced by processing. Prereq: 4200 and Agricultural Mechanization 3510 or consent of instructor. 3 hrs and 1 lab. W
4940 Advanced Meat Science (3) Qualitative and quantitative characteristics of meat and poultry as related to palatability, cookery, preservation, packaging and merchandising. Prereq: 3840, F, A
5000 Thesis (1-15) P/NP only. E
5100 Seminar (1) Reports and discussions of selected topics from research literature. May be repeated. Maximum 3 hrs. F, W, Sp
5120 Food Color (3) Chemistry of natural food pigments and measurement, notation, and preservation in food. Prereq: Nutrition and Food Sciences 3140 or equivalent. 2 hrs and 1 lab. Sp, A
5130 Food Enzymology (3) Commercial and native enzymes in manufacturing, processing, and spoilage of food. Prereq: Nutrition and Food Sciences 3150 or equivalent, Sp, A
5140 Food Flavors (3) Food flavor maintenance and improvement. Natural and synthetic compounds in manufacture of foods with predictable consumer acceptance. Technology of flavor manufacture and formulation. Techniques for determining flavor profiles. Prereq: 4210. 2 hrs and 1 lab. W, A
5150 Fats and Oils (3) Application of scientific principles to commercial technology of fats and oils. Prereq: 4130. 2 hrs and 1 lab. W, A
5200 Research (1-5) Research in selected areas. Completion of department head, credits and hours to be arranged. May be repeated. Maximum 10 hrs. E
5310 Food Products Development (3) Fundamentals of art, science, and technology applied to research, development, and marketing of new food products and processes. Prereq: 4210. 2 hrs and 1 lab. F
5320 Food Thermobiology (3) Fundamentals of heat transfer as related to rate of destruction of microorganisms and to rate of loss of food quality through calculation of minimum safe thermal process times for hermetically-sealed packages of foods. Prereq: 4200. 2 hrs and 1 lab. F
5420 Instrumental Analysis of Foods (3) Application of instrumental techniques to control food manufacturing processes. Prereq: 4140. 2 hrs and 1 lab. F
5510 Meat Technology (3) Physical and chemical changes that occur during conversion of muscle to meat, the influence these changes have on quality and composition; meat packaging, preservation, and quality control. Prereq: 3840. 2 hrs and 1 lab. Sp, A
5530 Advanced Food Microbiology (3) Identification of desirable and undesirable microorganisms in food products and relationship to manufacturing operations. Isolation and characterization of microorganisms from foods and plant equipment. Prereq: 4810 or Microbiology 3810. 3 labs. W
6000 Doctoral Research and Dissertation (3-15) P/NP only. E.
6010 Advanced Topics in Food Technology and Science (1) Selected readings, discussions and presentations of current topics, topics to be announced in advance. May be repeated. Maximum 6 hrs. S/NC only, F, W, Sp
6410 Advanced Food Processing (3) Role of processing treatments in modification of food properties; texture, color, and flavor characteristics. Prereq: 5120, 5140, and Food Science 5510 or consent of instructor. Sp, A

Forestry, Wildlife and Fisheries

MAJORS DEGREES M.S. M.S.

Wildlife and Fisheries Science


Assistant Professor: E. F. Dougall, Ph.D. Oregon State.
Forestry

4220 Forest Resource Management (3) Decision-making processes, forestry as integration of resource uses. Models of forestry as system; concepts of resource management and valuation; taxation of forest firm. Prereq: 4150.

4230 Forest-Resource Management Plans (4) Field problems and case studies in forest-resource management; the forest as a system; management of forest enterprises as a producer of timber, recreational services, watershed services, and wildlife; productivity and utilization models of forest management plans. Prereq: 4210. Sp

2420 Interpreting Forest Resource (3) Principles and techniques of interpreting forest resources; importance of environmental interpretation to management of forest resources; development and administration of interpretive facilities; overview of required field trips. Prereq: 3240 or equivalent. 2 hrs and 1 lab.

4300 Forest Policy (3) History of forestry in United States with emphasis on development of forest resource policies; current policies influencing development and management of forest resources; brief survey of policy implications of forest organizations in public and private sectors. Prereq: 4004.

3110 Forest Measurements and Biometry (4) Measurements of individuals in animal and plant populations; linear regression; sampling of forest populations; growth and potential production. Prereq: Plant and Soil Science 3610. 3 hrs and 1 lab.

3120 Wood Technology (4) Wood properties; identification of commercial woods by macro and micro characteristics. Prereq: 3040, 3050. 3050 may be taken concurrently. 2 hrs and 2 labs.

3220 Forest Products and Utilization (3) Harvesting and processing of forest products in stand conversion, intermediate and harvest cuts. Prereq: 3120.

3320 Principles of Silviculture (3) Influence of site factors on reproduction, growth, development, and characteristics of forest vegetation; classification of forest structure; silvicultural laws. Prereq: 3020, 3040, Plant and Soil Science 2130.

4022 Utilization (3) Wood-using industries; processes involved in sawmills, tree-log-lumber grading; pulpwod operations, flooring plants, treating plants; plant layout, flow diagrams. Prereq: 3120 or consent of instructor.

4023 Field Methods of Timber Inventory (4) Field measurements of forest trees; timber cruising; determining appropriate sample design for specific purposes; tree and stand growth; site evaluation; field problems. Prereq: 3110 and Agricultural Mechanization 3140.

4004 Forest Practice (3) Management of forest lands by public and private organizations; multiple-use concept as it influences management decisions; impact of public pressure for outdoor recreation on management decisions; management prescriptions. Prereq: 3260, 4006. S/NC only.

4006 Silvicultural Methods (4) Methods and application of intermediate and regeneration cuttings; site preparation, planting and seeding, modifications of cutting methods to obtain desired goods and benefits. Prereq: 3060, 3320, 4002. 4002 Sp.

4020 Forest Watershed Management (3) Water as a forest resource; role of forests in the hydrologic cycle; control of water quantity, quality, and regimen; watershed planning. Prereq. 3320 or consent of instructor. W

8120 Forestry Organization and Administration (3) Planning, organizing, and leadership concepts and cases; problem analysis and decision making in forest resources management. Prereq: Consent of instructor. 2 hrs and 1 lab.

4210 Forest Resource Management (3) Decision-making processes, forestry as integration of resource uses. Models of forestry as system; concepts of forest management and valuation; taxation of forest firm. Prereq: 4150.

9330 Forest Products Marketing and Measurement (3) Use of conventional aerial photography in forest-resource management; interpretation of detail, aerial inventories, preparation of coverage maps, uses of other remotely sensed imagery. Prereq: 4110 or equivalent. 1 hr and 2 labs.

4230 Interpreting Forest Resource (3) Principles and techniques of interpreting forest resources; importance of environmental interpretation to management of forest resources; development and administration of interpretive facilities; overview of required field trips. Prereq: 3240 or equivalent. 2 hrs and 1 lab.

5002 Non-Thesis Graduation Completion (3-15) Required for the non-thesis student not otherwise registered during any quarter when such a student wishes to take courses for credit, transfer credits, and/or utilize facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

5011 Problem Analysis in Forest Resources (3) Problem identification, analysis and solution in forest resources management. Identify, analyze, and prepare written report on a topic. Topic and report must have approval of all committee members. Formal presentation to faculty and students. Available only to students in the non-thesis option for the M.S. in Forestry.

5110 Special Problems in Forestry (1-6) May be repeated. Maximum 9 hrs. E

5220 Seminar in Forest Tree Biology (3) Growth, reproduction, and physiology of forest trees; forest ecology; variability and taxonomy of forest trees. Prereq: 3320 or Botany 4310.

5230 Seminar in Forest Management (3) New developments in forest organization and regulation; financial and operational planning in forest management. Prereq: 4230 or equivalent. W

5240 Seminar in Forest Genetics (3) Population genetics and species distributions. Prereq: 4240, Biological Science 3110, and consent of instructor.

5250 Recreation Planning for Forests and Associated Lands (3) Planning process for recreation development on forests and associated lands; analysis and critique of specific contemporary plans. Overnight field trips may be required. 2 hrs and 1 lab.

5260 Industrial Forestry (3) Structure and analysis of wood-using firms and industries. Forest taxation, land tenure and wood procurement alternatives. Development and application of forestry planning models. Prereq: 4320 or consent of instructor.

5270 Topics in Forest Industries Management (3) Current problems in industrial forestry. Executives from public and private business sector (concerned with forest industry) conduct classes in selected topics. Prereq: 4320 or consent of instructor.

5280 Seminar in Forest Biometry (3) Theory and application of forest measurements and sampling; tree, log and lumber quality; volume estimation techniques; growth and yield prediction. Prereq: 4003 or consent of instructor.

5310 Seminar (1) Current developments in forestry. Required of each graduate student in residence Winter Quarter. May be repeated. Maximum 2 hrs. S/NC only.

Wildlife and Fisheries Science

3230 Wildlife Management (3) Lives and ecological relationships of wild animals; biological, social, and economic aspects of their management. 2 hrs and 1 lab.

4450 Game Mammals (4) Classification, identification, distribution, natural history, and management principles of game mammals in North America. Prereq: 3330 or 1 yr of zoology. 2 hrs and 2 labs.

4460 Game Birds (4) Biology, classification, identification, distribution, and management of game birds in North America. Prereq: 3320 or 1 yr of zoology.

5410 Fish Populations (4) Principles and methods of fish population estimation; sampling techniques and equipment; population dynamics; age and growth. Prereq: Biology 3130, 8 hrs mathematics, or consent of instructor. 3 hrs and 1 lab or field period.

9510 Fish Populations (4) Principles and methods of fish population estimation; sampling techniques and equipment; population dynamics; age and growth. Prereq: Biology 3130, 8 hrs mathematics, or consent of instructor. 3 hrs and 1 lab or field period.

*Graduate course for non-forestry majors only.
4520 Fisheries Management (4) Methods of warm and cold water fisheries management including tech- 
niques for the collection, use, and preservation of fish habitat, and stock. Prereq: Biology 3130 or consent of instructor. 3 hrs and 1 field period. Sp.
5000 Thesis (1-15) P/NP only. E
5110 Special Problems in Wildlife and Fisheries Sciences (1-8) May be repeated. Maximum 9 hrs. E
5210 Seminar in Wildlife Conservation (3) Current special problems and issues in wildlife biology, public relations, and organizations and their programs. Prereq: 3230 or 
5310 Seminar (1) Current developments in wildlife and landscape design. open to no more than 10 graduate 
students in any given term. Prereq: 3230 or consent of instructor. W, A
5400 Advanced Topics in Wildlife Science (3) Recent advances and concepts, research techniques, and analysis of current problems. Prereq: 4450 and 4460 or consent of instructor. May be repeated. Maximum 6 hrs. S, NC only. W
5450 Wildlife Diseases (3) Necropsy of birds and mammals. Recognition of various diseases and 
methods of preparing pathological materials in the field and lab. Investigative procedures concerning wildlife deaths; diagnostic testing for microorganisms, pathology, pathology or parasitology, 4450 or 4460, or consent of instructor. 2 hrs and 1 lab. Sp, A
5460 Predator Ecology (3) Dynamics of terrestrial vertebrate predator populations in human-altered and natural environments. Analysis of predator-prey interactions. Prereq: 4450 and 4460 or equivalent and Zoology 4240. W, A
5500 Advanced Topics in Fishery Science (3) Recent advances and concepts, research techniques and analysis of current problems. Prereq: 4520 or consent of instructor. May be repeated. Maximum 6 hrs. S, A
5550 Fish Physiology (3) Mechanisms of circula- tion, excretion, osmoregulation, and nervous/hor- monal control of these systems in fishes. Practical applications of fish physiology in water pollution assessment, fish culture and fish management. Prereq: Consent of instructor. 2 hrs and 1 lab. W

Ornamental Horticulture and Landscape Design

MAJOR Ornamental Horticulture and Landscape Design

DEGREE M.S., Ph.D.

Professors:
G. D. Chater (Head), Ph.D. Ohio State; De Wolfe, Ph.D. Florida State; M. Callahan, Ph.D. Rutgers; H. v.d. Werken, GAUHT Horticulture College, Fredericksburg, Holland.
Associate Professors:
Assistant Professor:
D. T. Kendall, MLA Louisiana State.

*3030 Plant Propagation (3) Physiology, methodology, and environmental requirements for propaga- tion. Prereq: 8 hrs of biological science. 2 hrs and 1 lab. F

*3110 Greenhouse Management (3) Factors in- volved in management of greenhouses for produc- tion and research. Structures, soils, pest control measures, heating, ventilating, light, water sup- ply, crop succession. Prereq: Consent of Instructor. 2 hrs and 1 lab. F, Sp

3520 Intermediate Landscape Design (4) Applica- tion of concepts acquired in introductory landscape design projects. Refinement of graphic skills. History of landscape design related to contemporary applica- tions and the aspects of planning design and im- plementation. Use of plant materials in the design of

small and moderate scale landscapes. Prereq: 3610, 3810 or equivalent. 1 hr and 2-3 hrs. F, R

3630 Landscape Construction and Contracting (4) Construction methods, materials and practices of landscape installation and contracting. Site layout procedures, hardscape and drainage, landscape construction materials; application through detail design drawings and small scale projects. Landscape contracts, specifications and bidding procedures. Prereq: 3310, 3610; Agricultural Mechanization 2120 recommended. 1 hr and 2-3 hrs. Sp

4150 Nursery Production (4) Modern methods of producing liners, field and container grown woody ornamental plants. History and evolution of nursery industry and modern production recommendations for woody ornamental plants. Prereq: 3030, 3810 and Plant and Soil Science 2130. 2 hrs and 2 labs. F, Sp

4160 Nursery Management (3) Modern manage- ment methods for wholesale and retail nurseries, garden centers, and landscape contractors. Prereq: 3310. 2 hrs and 1 lab. W

4180 Park Design (4) Design criteria for parks and outdoors recreation systems. Park site selection, analysis, planning and management as related to parks and recreation areas. Evaluation of aesthetic and functional quality of parks and their impact on environmental quality of rural and suburban communities. Prereq: 3620. 2 hrs and 2 labs. Sp

4190 Advanced Landscape Design (4) Comprehen- sive application of landscape design skills and knowledge through a large scale project. Analysis, programming, planting design, construc- tion detailing, estimating, specifications, contracts and bidding. Prereq: 3510, 3620, 3630. 1 hr and 2-3 hrs. W, Sp

4220 Advanced Turfgrass Management (4) Princi- ples and scientific basis of turfgrass culture; adapta- tion, ecology, physiology, soil fertility and grass nutri- tion; climatic influences on grass culture; physiology of clipping and water management; traffic effects and compaction; and the physiological influences of pest infestations and contre measures. Prereq: 3510, 3 hrs and 1 lab. W

4300 Speciality Floriculture (3) Specific practices in production of minor cut flower and potted plant crops. Production methods for scheduling flowering or vegetative growth of specialty florist crops in con- trolled environments. Prereq: 3410. 2 hrs and 1 lab. Sp

4400 Individual Problem Study (1-5) May be re- peated. Maximum 10 hrs. E

5000 Thesis (1-15) P/NP only. E

5100 Special Problems in Ornamental Horti- culture and Landscape Design (3) May be repeated. Maximum 9 hrs. E

5210 Golf Course Design, Development, and Management (4) Principles and applications in de- sign, development, and management of golf courses. Selection and utilization of grass varieties and other plant materials and development of specifi- cations for nutritional, chemical, and mechanical maintenance. Financing, equipment, labor manage- ment, and public relations. Prereq: 4220 and consent of instructor. 2 hrs and 2 labs. Sp

5410 Historical Microtechnique (4) Preparation of plant tissue for microscopic examination, paraffin and plastic embedding, microtomy and mounting of sections, staining, and preparing slides and photographs. Prereq: General biology or botany; general and organic chemistry; and consent of instructor. 2 hrs and 2 labs. W

5500 Seminar (1) Current literature and develop- ments in ornamental horticulture and landscape design. May be repeated. Maximum 3 hrs. F, Sp

5610 Advanced Nursery Production (4) Prepara- tion and use of growing media for woody ornamental plants; nutrition of ornamental plants including di- agnosis, prevention and control of mineral de- ficiencies; development of fertilization programs for container and field-grown ornamentals. Prereq: 4150; Plant and Soil Science 3110; Botany 3210. 3 hrs and 1 lab. W

Plant and Soil Science

MAJOR Plant and Soil Science

DEGREES M.S., Ph.D.

Professors:
L. F. Stelter (Head), Ph.D. North Carolina State; F. F. Bell (Emeritus), Ph.D. Iowa State; D. L. Coffey, Ph.D. Purdue, V. B. Conner, Ph.D. Washington State, F. R. Fribourg, Ph.D. Iowa State; L. J. Jeffery, Ph.D. North Dakota State; L. M. Josephen (Emeritus), Ph.D. Wisconsin; W. L. Parks, Ph.D. Purdue; J. H. Reynolds, Ph.D. Wisconsin; L. N. Skolz, (Emeritus), M.S. Kansas State; M. E. Springer (Emeritus), Ph.D. California (Berkeley); H. D. Swingle (Emeritus), Ph.D. Louisiana State.

Associate Professors:

Assistant Professors:
D. F. Dayton, Ph.D. North Carolina State; C. E. Sama, Ph.D. Michigan State; D. R. West, Ph.D. Nebraska; J. D. Woldt, Ph.D. Auburn.

*3110 Soil Fertility and Fertilizers (4) Properties of soils in relation to plant nutrient availability and up- take. Methods of soil fertility evaluation and rec- ommendation of fertilizer use; manufacture and properties of fertilizers. Prereq: 2130. 3 hrs and 1 lab. W

*3120 Grain and Oil Crops (3) Distribution, im- portance, morphological, culture, harvesting, and utilization of corn, small grains, grain sorghum, soy- beans and related crops. Prereq: 2130, 8 hrs bio- logical science. 2 hrs and 1 lab. W

*3140 Forage Crops (4) Characteristics, adapta- tion, improvement, culture, harvesting, and market- ing of cotton and tobacco. Prereq: 2130, 8 hrs biological science. 3 hrs and 1 lab. F

*3170 Vegetable Crops (4) Characteristics, eco- nomic importance, adaptability and production of vegetables for fresh and processing markets with emphasis on both warm and cool season crops. Prereq: 2130. 8 hrs biological science. 3 hrs and 1 lab. F

*3180 Fruit Crops Management (4) Soils, planting, cultivation, development of fruit crops; pest control, harvesting, packing, storage, and prun- ing. Prereq: 2130, 8 hrs biological sciences. 3 hrs and 1 lab. W

*3220 Soil Management (4) Soil management for crop production including cropping systems, fertilizer use, and tillage operations for specified soil and farming conditions. Prereq: 2130. 3 hrs and 1 lab. F, Sp

*3230 Soils in Forestry (3) Soil as a medium for tree growth; relation of physical, chemical, and biological properties of soils to tree growth and management of forest stands. Soil properties of importance in road location, recreational development, and watershed management. Prereq: 2130. Forestry 3320. 2 hrs and 1 lab. W

*3610 Statistics for Agricultural Sciences (3) Ap- plication of statistics to interpretation of agricultural research. Notation, descriptive statistics, probability, distributions, confidence intervals, students t and chi-square tests, analysis of variance, mean separation procedures, linear regression and correlation. Prereq: Math 1550 or 1850 or equivalent. 3 hrs and 1 rec. F, W

4110 Soil Chemistry (4) Colloidal systems; prop- erties and behavior of colloidal soil materials; rela- tionship between chemical properties and the availa- bility. Prereq: 2130 and Physics 1210. 3 hrs and 1 lab. F

*Clyde B. Austin Distinguished Professor

*Graduate credit for non-majors only.
4120 Principles of Crop Breeding (4) Genetic principles and methods of crop improvement. Prereq: Biology 3110 or equivalent. 3 hrs and 1 lab. W.

4250 Agricultural Pesticides (4) Regulation of pesticidal use, pollution, impact on environment, and resistance of pest populations. Prereq: 3610 or consent of instructor. 3 hrs and 1 lab. W.

4320 Soil Formation, Morphology and Classification (4) Soil parent materials, basic pedogenic processes, soil morphology, and interpretation of morphologic features. Prereq: 3110 or equivalent. 3 hrs and 1 lab. F.

4350 Soil Survey (2) Techniques of mapping soils, development of mapping legends and documentation and testing of mapping unit descriptions and interpretations. Prereq or coreq: 4520. 1 hr. W. Sp.

4400 Problems in Plant and Soil Science (1-6) May be repeated. Maximum 9 hrs. E.

4410 Crop Physiology and Ecology (4) Application of principles of plant physiology and ecology to crop production. Effects of environmental factors (light, heat, water, soil, etc.) on physiological processes. Prereq: Agriculture 1140 or 1120; organic chemistry; 2130 and any Plant and Soil Science course at 3000-level except 3610. 3 hrs. W. A.

4710 Principles of Weed Science (4) Principles of cultural, biological, and chemical control of weeds, effects of environment, principles of herbicide selectivity and activity, types of herbicides and specific recommendations for various crops and non-crop uses. Prereq: Agriculture 1140 or 1120; organic chemistry; 2130 and any Plant and Soil Science course at 3000-level except 3610. 3 hrs. W. A.

5000 Thesis (1-15) P/NP only. E.

5100 Special Problems in Plant and Soil Science (1-6) May be repeated. Maximum 9 hrs. E.

5240 Soil Productivity and Management (3) Concepts of soil productivity and management, quantitative evaluation of factors and their interaction affecting soil management decisions, cropping systems, water control and management, tillage and fertility management, Planning and evaluation of specific soil management programs. Prereq: 3220 and 4110 or consent of instructor. W, A.

5250 Pedology (4) Factors and processes of formation of soils, soil classification, physical and chemical properties of soils; soil in an ecosystem; classification of soils. Prereq: 4320 or consent of instructor. 3 hrs and 1 lab. W, A.

5310 Design and Interpretation of Experiments (4) Experimental design and procedures; field plot techniques; analysis and interpretation of data from agricultural experiments; linear models and contrasts, analysis of variance for nested, randomized block designs, and factorial experiments. Prereq: 3610 or equivalent; a computer science course or UTCC SAS short course. W.

5340 Soil Physics (4) Physical and chemical relationships among soil, liquid, and gaseous phases of soil system and their relation to density, moisture, aeration, and plant growth. Introduction to soil moisture thermodynamics; physically characterize a soil. Prereq: 4110 or consent of instructor. 3 hrs and 1 lab. W, A.

5370 Advanced Soil Fertility (3) Concepts of soil chemistry as they relate to nutrient absorption by plant roots; interrelation of these concepts to soil fertility, plant analysis and soil management. Prereq: 4110. W.

5390 Advanced Soil Chemistry (3) Structural properties of soil, chemical reactions, ion exchange. Donnan Equilibrium, double layer theory. Prereq: 4110 or consent of instructor. Sp. A.

5500 Seminar (1) May be repeated. Maximum 3 hrs. E.

5710 Advanced Plant Genetics (3) Mutation systems: controlling elements, induced mutations, genome organization, polyploidy, tetrasomic inheritance, asexuality, incompatibility systems, and genetic engineering of higher plants. Prereq: Basic genetics or consent of instructor. F, A.

5720 Quantitative Genetics (3) Genetic constitution of populations; quantitative, random, and selection; recombina

5750 Advanced Plant Breeding I (4) Developing breeding program objectives; historical and theoretical development of concepts of components of variation, heritability, selection intensity, methods of selection, linkage in relation to selection, genotypy by environment interaction, and genetic resistance and vulnerability to pests. Prereq: 4120, 5310 or concurrent registration, or consent of instructor. 3 hrs and 1 lab. W, A.

5760 Advanced Plant Breeding II (4) Concepts and utilization of heterosis, inbreeding, stability parameters, selection indices, methods of selection, and germplasm resources in breeding program for improvement of crop species. Prereq: 5750 or consent of instructor. 3 hrs and 1 lab. Sp. A.

5810 Advanced Crop Climatology and Ecology (4) Quantification of climatic and meteorologic factors affecting crop growth; world climates, crop distribution and productivity, and their interaction; general and specific relations among environmental factors, crop organisms and agricultural systems. Prereq: 3610 or equivalent; 4410, or Botany 3210 or 4310. 3 hrs and 1 lab. F.

5820 Advanced Crop Physiology (4) Photosynthetic efficiency in field and relationship with evapotranspiration, Hardiness development and tolerance for field stresses: drought, cold, heat, flooding, Photoperiodism, flowering, and seed production. Nitrogen-fixing relations of bacteria with legumes and grasses. Prereq: 4410. 3 hrs and 1 lab. W, A.


5855 Plant Growth Regulation and Control (1) Laboratory course in plant growth, regulation and control under field, greenhouse, laboratory and storage environments. Prereq or coreq: 5840, 5850, or 5560. May be repeated. Maximum 4 hrs. E.

5860 Growth Control with Chemicals (3) Character, theories of action and use of plant growth regulators with special emphasis on practical aspects of use for controlling plant growth, development and metabolism to increase efficiency and production of agricultural and horticultural plants. Special consideration to current commercial uses. Prereq: Botany 5210 or equivalent. Sp. A.

6000 Doctoral Research and Dissertation (3-15) P/NP only. E.

6100 Topics in Soil Science (1-3) Student needs and interests determine course content. Prerequisites: knowledge of soil dynamics, clay structure and surface chemistry, soil mineralogy, plant mineral nutrition, soil microbial ecology, and use of plants, soil structure, soil thermal properties, interaction in the soil-plant environment. May be repeated. Maximum 15 hrs. E.

6200 Topics in Plant Breeding and Genetics (1-3) Student needs and interests determine course content. Prerequisites: knowledge of biotechnology, polyploidy, genetic engineering, interspecific hybridization, linkage, screening methods, genome organization. May be repeated. Maximum 15 hrs. E.

6300 Topics in Crop Physiology and Ecology (1-3) Student needs and interests determine course content. Microclimatology of agroecosystems, crop dynamics; responses to stress, physiology of crop growth and reproduction, interaction of physiological and germination in crop production, theory and application of quantitative methods in crop physiology and ecology research. May be repeated. Maximum 9 hrs. E.

5410 Experimental Designs (3) Principles of balanced and unbalanced designs used in agricultural research: use of linear models, dummy variables, simple multivariable linear models, response surfaces, discriminant analysis, multiple regression, heterogeneity of slopes, and other techniques. Prereq: 5310 and Statistics 4310 or equivalent. F, A.

College of Veterinary Medicine

H. Kitchen, Dean
C. F. Reed, Associate Dean
W. H. Grau, Jr., Associate Dean

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

The college is organized into six academic departments: Animal Science (jointly with the College of Agriculture), Environmental Practice, Microbiology (jointly with the College of Liberal Arts), Pathobiology, Rural Practice, and Urban Practice.

Primary objective of the college is to educate veterinarians for private practice. However, the professional curriculum provides an excellent basic medical 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.

Most veterinarians are engaged in private practice. The majority of these are in general practices which deal with the diseases of all kinds of animals. About one-fourth of the veterinarians in the United States are engaged exclusively in pet or companion animal practice. A growing number are concerned with the health problems of zoo animals, laboratory animals, wildlife, and aquatic species.

Veterinarians also find rewarding careers in the U.S. Public health deal with the diseases of the U.S. Army and Air Force, and in state, county, or local health agencies. A large 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, and vaccine production, and the protection of our country against the importation of foreign diseases.

Excellent opportunities exist for veterinarians interested in research—both research for the direct benefit of animals and research conducted with animals but for the
benefit of humans. Such opportunities are available at colleges and universities and with governmental agencies, private research institutions, and biological and pharmaceutical companies.

Facilities
Administrative offices of the College of Veterinary Medicine are located in Morgan Hall on the agricultural campus. The Department of Animal Science is housed in Brehm Animal Science Building, also on the agricultural campus, and the Department of Microbiology is located in Walters Life Sciences Building on "The Hill" of The University of Tennessee, Knoxville.

The Veterinary Medicine Building on the agricultural campus houses the departments of Environmental Practice, Rural Practice, Urban Practice, and Pathobiology. Additionally, the Veterinary Teaching Hospital, clinics, and the Agriculture/Veterinary Medicine Library are contained within this modern structure of 246,000 gross square feet.

The college has research facilities on Cherokee Farm adjacent to the UT Hospital. Satellite teaching-research facilities are located in Middle and West Tennessee.

Admission Requirements
Admission to the program of the College of Veterinary Medicine is limited to that number for which an education of high quality can be provided with the resources available to the college.

To qualify for admission, a candidate must have completed at least the following minimum pre-veterinary requirements:

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Minimum Credits</th>
<th>Quarter Semester</th>
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<tbody>
<tr>
<td>English, including speech</td>
<td>12</td>
<td>8</td>
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<tr>
<td>Humanities</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>12</td>
<td>8</td>
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<td>Mathematics through calculus</td>
<td>8</td>
<td>6</td>
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<td>Chemistry: general</td>
<td>12</td>
<td>8</td>
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<td>Organic</td>
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<td>Biochemistry</td>
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<td>4</td>
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<tr>
<td>Physics</td>
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<td>Biology or zoology</td>
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<td>8</td>
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<td>Microbiology</td>
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<td>3</td>
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<tr>
<td>Animal science, including nutrition and genetics</td>
<td>12</td>
<td>9</td>
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Admission Procedure
Admission of new students will be for the fall quarter each year. Applicants will be screened carefully by a faculty committee to determine those best qualified for admission within the college enrollment quota.

Applicants will be considered in the following order of priority: (1) residents of Tennessee; (2) residents of other states.

Forms and instructions for making application for admission may be obtained from:

Director of Admissions
202 Student Services Building
University of Tennessee
Knoxville, Tennessee 37996-0200

Applications must be completed and mailed so as to reach the Director of Admissions by January 15 each year. All pre-veterinary requirements must be completed by the end of the spring term of the year in which the student plans to enroll in the College of Veterinary Medicine.

Course Load
The professional curriculum of the College of Veterinary Medicine requires a specific number of hours each quarter. A student may enroll for fewer or more than that number only with the permission of the dean. Because of the sequential and highly integrated character of the professional curriculum, all courses in a given quarter are considered prerequisite to those in the succeeding quarter.

Extramural Programs
The opportunity to participate in off-campus learning experiences may be available for a limited number of students during the latter half of the final year of the professional curriculum. Selection of an extramural learning experience will require approval by the department concerned and the College of Veterinary Medicine Curriculum Committee. The extramural program identified by the student must represent a learning experience not available within The University of Tennessee, Knoxville.

Professional Curriculum
The professional curriculum in veterinary medicine is an 1 1-academic quarter, year-round program, including summers. The first year (three quarters) consists mostly of pre-clinical subjects such as anatomy, physiology, microbiology, parasitology, and general pathology. The second year (four quarters) includes the study of diseases, their causes, diagnosis, treatment, and prevention. The final calendar year is devoted to intensive training in the solving of animal disease problems, including extensive clinical experience in the teaching hospital. The curriculum also provides for education in the science and art of veterinary medicine and in paramedical subjects such as animal behavior, medical communication, professional ethics, jurisprudence, economics, and practice management.

Only students officially enrolled in the College of Veterinary Medicine may register for 8000-level courses.

<table>
<thead>
<tr>
<th>FIRST YEAR</th>
<th>Hours Credit</th>
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<tbody>
<tr>
<td>Fall Quarter</td>
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<tr>
<td>Vet. Animal Science 8510</td>
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</tr>
<tr>
<td>Vet. Microbiology 8101</td>
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</tr>
<tr>
<td>Vet. Animal Science 8240</td>
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<tr>
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<tr>
<td>Winter Quarter</td>
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</tr>
<tr>
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<td>Spring Quarter</td>
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<tr>
<td>Vet. Microbiology 8103</td>
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<td>Pathobiology 8730</td>
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<td>Environmental Practice 8612</td>
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<td>Fall Quarter</td>
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<table>
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<th>THIRD YEAR</th>
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<td>Basic Sequence roughly equivalent to</td>
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<td>Summer and Fall Quarters</td>
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<td>Pathobiology 8700 - 2 weeks</td>
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<tr>
<td>Radiology 8401 - 2 weeks</td>
<td>3</td>
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<tr>
<td>Special Services 8402 - 2 weeks</td>
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<tr>
<td>Rural Practice - 6 weeks</td>
<td>12-16</td>
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<tr>
<td>Urban Practice - 8 weeks</td>
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<td>Seminars</td>
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<td>44 hours</td>
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In addition, academic expertise of staff members at CARL and Oak Ridge is used on appropriate occasions.

PROFESSIONAL COURSES

8240-50 Veterinary Physiology (4,5) Introduction to concepts and problems in physiology which form a base for clinical applications and for formal training in pharmacology, medicine, pathology, and surgery. Order of sequence: Cellular, cardiovascular, renal, respiratory, neural and endocrine physiology. 8240: 5 hrs and 1 demonstration, 8250: 4 hrs and 1 demonstration. F, W

8510-20 Veterinary Histology/ Embryology (4,5) Cytology, histology and organology of animal body systems, structural and functional interrelationships. Embryonic development from fertilization and origin of congenital defects. Correlated with 8240-50 and 8540-50. 8510: 2 hrs and 2 labs; 8520: 3 hrs and 2 labs, F, W

8540-50 Veterinary Gross Anatomy (5,5) Lab covering gross and applied anatomy of common domestic animals (dog, cat, horse, cow). Dissection of embalmed specimens; prosections, slides, models, and live animals. Sequence of organ system study correlated with 8510-20. F, W

8570 Special Problems in Animal Science (2-20) Certain topics in anatomy, histology and physiology. May be repeated. W, Sp

8575 Advanced Seminar in Animal Science (1-4) Applied anatomy, histology and physiology, F, Su

Graduate Program

The College also administers a graduate program involving all departments and leading to the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) 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 and physiology, Microbiology, bacteriology, virology and immunology, Ecology, environmental toxicology, Pharmacology, Public Health, and Comparative and Experimental Medicine. (Refer to other sections of this catalog for a full description of these programs.) The majority of the graduate students and graduate faculty of the College of Veterinary Medicine are involved in the Comparative and Experimental Medicine program (see page 94). This program provides a wide spectrum of interdisciplinary training that prepares graduates to assume positions in biomedical environments and in teaching or research capacities involving humans or animals.

Departments of Instruction

Animal Science—Veterinary Medicine

Professors:
D. O. Richardson (Head), Ph.D. Ohio State; K. M. Barth, Ph.D. Rutgers; M. C. Bell, Ph.D. Oklahoma State; J. Keyser (Emeritus), Ph.D. Ohio State; C. G. Chamberlain (Emeritus), Ph.D. Iowa State; B. H. Erickson, Ph.D. Kansas State; O. G. Hall (Dean), Ph.D. Iowa State; S. L. Hansard (Emeritus), Ph.D. Florida; E. R. Lidvall, M.S. Tennessee; G. M. Mermian (Emeritus), D.V.M. Michigan State; J. B. McLaren, Ph.D. Auburn; J. R. Miller, Ph.D. Georgia; J. M. Montgomery, Ph.D. Wisconsin; R. L. Murphy (Emeritus), Ph.D. Wisconsin; H. V. Shirley, Ph.D. Illinois; R. R. Shrode, Ph.D. Iowa State; R. L. Tagwell (Emeritus), Ph.D. Kansas State; C. E. Wylie (Emeritus), A.M. Missouri.

Associate Professors:

Assistant Professors:
B. R. Bell, Ph.D. North Carolina State; J. A. Corrick, Ph.D. Tennessee; W. C. Cullen, Ph.D. Minnesota; J. DiBartola, Ph.D. Michigan State; R. Geist, Ph.D. Maine; H. G. Katteh, Ph.D. VPI; T. W. Schmitt, Ph.D. Tennessee; J. D. Smalling, Ph.D. Texas A & M.

GRADUATE COURSES

5000 Thesis (1-15) P/NP only. E

5010 Special Topics in Environmental Medicine (1-3) Aberrant metabolism, pharmacokinetic studies, toxicokinetic studies, epidemiology and techniques in molecular biology: toxicologic absorption, gas chromatography, ultracentrifugation, extractive techniques and radioimmunoassay. Prereg: Consent of instructor. May be repeated. Maximum 6 hrs. E

5020 Experimental Animal Surgery (4) Competence in performing humane surgical modifications of experimental animals. Techniques of anesthesia. Drug administration and postoperative care. Prereg: Zoology 4500, 4410, 3080, and/or consent of instructor. Sp

5611-12 Pharmacology (2,5) Molecular basis of drug action: pharmacokinetic and pharmacodynamic principles; clinical and toxicological applications. Correlated with Animal Science 8240-50. Prereg: Consent of instructor and Dean, College of Veterinary Medicine, W, Sp

6000 Doctoral Research and Dissertation (3-15) P/NP only. E

6010 Advanced Topics in Environmental Medicine (1-3) Current and future research methodology, laboratory situation, recent advances in instrumentation in analytical techniques for environmental medicine. Prereg: Consent of instructor. May be repeated. Maximum 6 hrs. E

Microbiology—Veterinary Medicine

Professors:
A. Bloom (Head), Ph.D. Chicago; R. W. Beck, Ph.D. Wisconsin; J. M. Becker, Ph.D. Cincinnati; R. J. Courney, Ph.D. Syracuse; T. C. Monte, Ph.D. Maryland; W. S. Rogers, Ph.D. Yale; B. T. Rouse, B.Y. University of Bristol (England); T. J. University of Gothenburg (Canada); J. M. Woodward (Emeritus), Ph.D. Kansas; C. J. West, Ph.D. Indiana.

Associate Professors:
D. A. Benisi, Ph.D. Cornell; D. A. Brian, D.V.M., Ph.D. Michigan State; G. S. Sayler, Ph.D. Idaho.

Assistant Professors:
R. M. Moore, Ph.D. Texas-Austin; K. M. Sirokin, Ph.D. Michigan State; G. Stacey, Ph.D. Texas-Austin.

PROFESSIONAL COURSES

8101 Veterinary Bacteriology and Mycology (5) Pathogenesis of bacterial and fungal diseases. Taxonomic study relating microbial structure, metabolism and genetics to patterns of disease and mode of action of antimicrobials. 3 hrs and 2 labs, F, W

8102 Veterinary Virology (4) Structure and replication of animal viruses, classification of viruses, mechanisms of viral pathogenesis. Techniques for quantifying viruses, viral antigens, and antiviral antibodies. Fundamental for understanding best approaches to viral diagnosis and immunophylaxis. 2 hrs and 2 labs, W

8103 Veterinary Immunology (4) Immunobiology, mechanisms of immune reaction, diagnostic immunology, role of immune response in preserving integrity of body as well as in causing disease. 2 hrs and 2 labs, W

8175 Advanced Seminar in Microbiology (1-4) Applied microbiology such as serologic diagnosis, clinical laboratory procedures. Correlated with 8240-50, 8250, and 8311. W, Sp

GRADUATE COURSES

5000 Thesis (1-15) P/NP only. E

5010 Special Topics in Environmental Medicine (1-3) Aberrant metabolism, pharmacokinetic studies, toxicokinetic studies, epidemiology and techniques in molecular biology: toxicologic absorption, gas chromatography, ultracentrifugation, extractive techniques and radioimmunoassay. Prereg: Consent of instructor. May be repeated. Maximum 6 hrs. E

5020 Experimental Animal Surgery (4) Competence in performing humane surgical modifications of experimental animals. Techniques of anesthesia. Drug administration and postoperative care. Prereg: Zoology 4500, 4410, 3080, and/or consent of instructor. Sp

5611-12 Pharmacology (2,5) Molecular basis of drug action: pharmacokinetic and pharmacodynamic principles; clinical and toxicological applications. Correlated with Animal Science 8240-50. Prereg: Consent of instructor and Dean, College of Veterinary Medicine, W, Sp

6000 Doctoral Research and Dissertation (3-15) P/NP only. E

6010 Advanced Topics in Environmental Medicine (1-3) Current and future research methodology, laboratory situation, recent advances in instrumentation in analytical techniques for environmental medicine. Prereg: Consent of instructor. May be repeated. Maximum 6 hrs. E

Microbiology—Veterinary Medicine

Professors:
A. Bloom (Head), Ph.D. Chicago; R. W. Beck, Ph.D. Wisconsin; J. M. Becker, Ph.D. Cincinnati; R. J. Courney, Ph.D. Syracuse; T. C. Monte, Ph.D. Maryland; W. S. Rogers, Ph.D. Yale; B. T. Rouse, B.Y. University of Bristol (England); T. J. University of Gothenburg (Canada); J. M. Woodward (Emeritus), Ph.D. Kansas; C. J. West, Ph.D. Indiana.

Associate Professors:
D. A. Benisi, Ph.D. Cornell; D. A. Brian, D.V.M., Ph.D. Michigan State; G. S. Sayler, Ph.D. Idaho.

Assistant Professors:
R. M. Moore, Ph.D. Texas-Austin; K. M. Sirokin, Ph.D. Michigan State; G. Stacey, Ph.D. Texas-Austin.
Assist Professors: M. D. McCracken, D.V.M. Kansas State; Ph. D. Purdue, S. Patton, D.V.M. Ohio State; S. Patton, Ph. D. Kentucky.


PROFESSIONAL COURSES

8700 Basic Pathobiology Rotation (3) Practice and/or demonstrations in laboratory diagnosis; postmortem examination and clinical pathologic, parasitologic, and microbiologic techniques. Su, F.

8710 Veterinary Pathology (5) Causes of disease, disturbances of cell growth, inflammation, and neo-plasia. 3 hrs and 2 labs. Sp.

8730 Veterinary Parasitology (4) Parasytology, parasitology, and entomology and relating to disease in animals. 3 hrs and 1 lab. Sp.

8760 Advanced Pathobiology (3) Further training in clinical laboratory diagnostic procedures, and in postmortem examinations. W, Sp.

8770 Special Problems in Pathobiology (2-10) Special problems in diagnosis, interpretation of lesions, with 8611, 8612, and 8775. W, Sp.

8775 Advanced Seminar in Pathobiology (1-4) Diagnostic topics: cytology, electron microscopy, histologic techniques. Su, F.

GRADUATE COURSES

5000 Thesis (1-15) P/NP only. E.

5010 Comparative Pathology (5) Lectures and lab. Pathogenic mechanisms. Comparative aspects. Lectures reinforced by lab study of gross, microscopic and ultrastructural lesions. Prereq: Zoology 3060, 3320. F, A.

6000 Doctoral Research and Dissertation (3-15) P/NP only. E.

6010 Special Topics in Pathology (1-3) E.

6020 Special Problems in Pathobiology (1-5) Necropsy, histopathology, diagnostic research, clinical pathology, clinical microbiology, and clinical mycology, and clinical virology. May be repeated. Maximum 20 hrs. E.

6030 Veterinary Biopsy (1-2) Examination of biopsy specimens and interpretation of observations. Preparation of specimens for sectioning. Prereq: Consent of instructor. May be repeated. Maximum 4 hrs. E.

6035 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.

6040 Veterinary Pathology Seminar (1) Microscopic slides and transparencies of lesions from cases examined by pathologic, parasitologic, and entomologic techniques. Students present seminar one per term enrolled. Prereq: Consent of instructor. May be repeated. Maximum 2 hrs. Class meets once monthly. E.

6045 Pathobiology Seminar (1) Subjects of current interest in biomedical science. Students present seminar one per term enrolled. Prereq: Professional medical degree or consent of instructor. F, A.

6052 Pathogenesis and Diagnosis of Virus Diseases in Domestic Animals (5) Biology of viruses and pathology of virus infection in domestic animals. Prereq: Biochemistry 4110-20, 4119; Microbiology 4430, 4439; consent of instructor. W.

6055 Techniques in Pathology (3) Fixation, processing and staining of tissue specimens; specialized gross dissection techniques; photography of gross specimens and photomicrography. Prereq: Consent of instructor. 2 hrs and 1 lab. F, A.

6060 Principles of Pathology (2) Advanced topics in pathobiology, diagnostic mechanisms of disease, pathophysiology, cellular degeneration, inflammation, immunopathology, histology, and cytology. Advanced microbiologic and morphologic responses of various cells, tissues, and organs to injury and other metabolic derangements. Participants present seminars on selected topics from current literature and textbooks. Prereq: Consent of instructor. F, A.

Rural Practice


T. L. Toal, D.V.M. Georgia.


Interdepartmental Offerings

Veterinary Medicine

PROFESSIONAL COURSES

8010 Client Relations and Communication Skills (1) Interpersonal skills as they apply to client relations and communication with colleagues, employees, general public. 1 lab. S/NC only. Sp.

8310 Introduction to Veterinary Medical Practice (2) Animal species, breed identification, basic care, feeding, restraint, handling. Introduction to physical diagnosis, interventional techniques, blood sampling, etc. 1 hr and 1 lab. F.

8311 Introduction to Veterinary Medical Practice (2) Physical diagnosis, history taking, and client relations: anesthetic principles, agents, and techniques. 1 hr and 1 lab. Sp.

8320 Medical Science Interaction Laboratory (3) Multidisciplinary lab, lectures and discussions to provide integrative learning and understanding of physiologic, pharmacologic, and surgical concepts. Anesthetic and surgical principles and techniques, humane care of animals, introduction to instruments used to measure physiologic processes and drug effects, use of physiologic recordings. Correlated with 8240, 8250, 8611 and 8612. 2 hrs and 1 lab. Su.

8340 Integumentary System (4) Diseases of the integumentary system of animals, with emphasis on laboratory examination, interpretation of pathologic features, diagnosis, and treatment. 3 hrs and 1 lab. F.

8341 Hematology and Introductory Clinical Pathology (4) Laboratory and clinical approach to diagnosis and treatment of hematopoietic system diseases, and principles and methods of laboratory evaluation of diseases from other systems courses. 3 hrs and 1 lab. Su.

8342 Alimentary Tract (9) Physiologic basis, pathology, diagnosis, and treatment of diseases of alimentary tract and digestive organs. 8 hrs and 1 lab. F.


8344 The Art of Veterinary Medicine (1) Specific diagnostic problems or paramedical subjects important to veterinary medical practice: differential etiology, diagnosis, and treatment of certain disease signs or symptoms; implications for veterinary medical jurisprudence and ethics, practical economics, veterinary history. May be repeated. S/NC only. F, W, Sp.

8350 Reproductive System (6) Diagnosis, therapy and prevention of conditions causing reduction of the reproductive efficiency of domestic animals. Abnormalities of the genital tract, diagnosis and prevention of mastitis. 4 hrs and 2 labs. F.
8351 Urinary System (4) Understanding of urinary-renal system of animals in health and disease. 3 hrs and 1 lab. W

8352 Cardiovascular System (3) Pathology, diagnosis, and management of cardiovascular diseases of animals. Anatomic, physiologic, and pharmacologic principles which provide basis for medical and surgical treatment. 2 hrs and 1 lab. Su

8353 Endocrine, Metabolic and Nutritional Diseases (4) Biochemical and pathophysiologic mechanisms of endocrine, metabolic and nutritional diseases of animals: diagnosis, therapy and prevention. F

8360 Musculoskeletal System I (5) Pathology, diagnosis, and treatment of musculoskeletal diseases of small animals, pathologic changes, interpretation of radiographs and surgical procedures. 4 hrs and 1 lab. W

8361 Musculoskeletal System II (5) Pathology, diagnosis, prognosis, and management of musculoskeletal diseases of large animals: Functional anatomy, radiographic interpretation, surgical procedures and medical therapy applicable to equines and ruminants. 4 hrs and 1 lab. W

8362 Veterinary Toxicology (3) Molecular mechanisms and pathologic and clinical features of animal diseases caused by common toxic agents. Su

8363 Public Health (2) Public health aspects of veterinary medicine and nature of related laws, ordinances and regulations. Veterinarian's role in the protection of environment, ecology, and quantity and quality of food. Su

8364 Animal Dietetics (1) Applied nutrition of cattle, swine, horses, dogs and cats for the veterinarian. Diets and methods of feeding for both normal and special situations. Sp

8365 Radiology (4) Basic radiologic technology, radiation safety, special procedures and radiographic interpretation in diagnosis of clinical cases. 3 hrs and 1 lab. W

8366 Respiratory System (4) Detection and diagnosis of upper and lower respiratory diseases of domestic animals. Pathophysiology and pathology of infectious and noninfectious diseases. Lectures and lab with live and simulated case studies. 3 hrs and 1 lab. W

8370 Neurosciences (9) Normal and abnormal neural structure and function in animals; clinical neurology and neuropathology. 6 hrs and 3 labs. Sp

8371 Visual and Auditory Systems (3) Diseases involving eyes and ears of animals, with emphasis on anatomic, physiologic, and pathologic features. 2 hrs and 1 lab. Sp

8372 Comparative Medicine (4) Diagnosis, prevention, and treatment of diseases of laboratory animals, avian species, and marine mammals, seen most commonly by practicing veterinarians. Sp

8375 Principles of Medicine (4) Physiologic and pathologic principles underlying mechanisms of disease. Selected examples of human and animal diseases, recent advances in principles of veterinary medicine. Prereq: Consent of instructor and Director, Comparative and Experimental Medicine Graduate Program. Sp

5343 Patterns of Disease (5) Host-agent relationships in disease of animals. Pathogenesis, laboratory diagnosis, control, and public health significance. Epidemiology and application in study of diseases in animal populations. Prereq: Consent of instructor and Director, Comparative and Experimental Medicine Graduate Program. Su

5362 Veterinary Toxicology (3) Pharmacologic basis and pathologic features of diseases of animals caused by common toxic chemicals: clinical manifestations, diagnosis, and treatment. Prereq: Consent of instructor and Director, Comparative and Experimental Medicine Graduate Program. Su

5363 Public Health (2) Public health aspects of veterinary medicine and nature of related laws, ordinances and regulations. Veterinarian's role in the protection of environment, ecology, and quantity and quality of food. Prereq: Consent of instructor and Director, Comparative and Experimental Medicine Graduate Program. Su

5372 Comparative Medicine (4) Diagnosis, prevention, and treatment of diseases of laboratory animals, avian species, and marine mammals, seen most commonly by practicing veterinarians. Prereq: Consent of instructor and Director, Comparative and Experimental Medicine Graduate Program. Sp

5375 Principles of Medicine (4) Physiologic and pathologic principles underlying mechanisms of disease. Selected examples of human and animal diseases, recent advances in principles of veterinary medicine. Prereq: Consent of instructor and Director, Comparative and Experimental Medicine Graduate Program. Sp
College of Business Administration

C. Warren Neel, Dean
John R. Moore, Associate Dean
Roger L. Jenkins, Associate Dean for Graduate Programs
Richard C. Reizenstein, Associate Dean for Undergraduate Programs
Gerald D. Sentell, Director of Management Development Programs
David A. Hake, Director, Center for Business and Economic Research

Graduate Programs

The College of Business Administration offers programs leading to six advanced degrees: the Doctor of Business Administration, the Doctor of Philosophy with majors in Economics and in Management Science, the Master of Arts with a major in Economics, the Master of Science with a major in Statistics, the Master of Accountancy, and the Master of Business Administration. The Department of Management and the Department of Psychology in the College of Liberal Arts jointly offer an intercollegiate program in Industrial and Organizational Psychology leading to the Master of Science degree. (See page 96.) Also, the Department of Management Science offers an intercollegiate program leading to the Master of Science degree. (See page 36.)

The two College-wide programs, the MBA and the DBA, are described below. Descriptions of other degree programs will be found under the appropriate departmental or program headings.

Academic Common Market. An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UTK on an in-state tuition basis. Programs in the College of Business Administration available to residents of the states indicated include: DBA (all concentration areas)—West Virginia; MBA (Transportation and Logistics)—Virginia and West Virginia; Industrial and Organizational Psychology (M.S. and Ph.D.)—Alabama, South Carolina, and Virginia. Additional information may be obtained from the Graduate Programs office of this college.

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. A full-time student can complete the program in six academic quarters. Those with degrees in business earned at an institution accredited by the American Assembly of Collegiate Schools of Business (AACSB) should be able to complete the program in five quarters.

Full-time students are expected to successfully complete 12 hours per quarter and part-time students 6 hours per quarter. Scheduling and sequencing of courses are done with this assumption in mind. The complete MBA program with a concentration in management is offered by the regular graduate faculty of the College for part-time students on the Knoxville campus and at Oak Ridge.

The program consists of the MBA core (twelve to nineteen courses depending upon exemptions based on prior studies and/or proficiency examinations) and a concentration/electives block of eight courses. Each course is 3 quarter hours of graduate credit. Thus, the total program may consist of from 60 to 81 quarter hours.

Prerequisites. Upon matriculation, the student must have received a bachelor's degree from a regionally accredited institution. College level mathematics through at least one course in calculus is the only prerequisite requirement for entry into the program. Those electing the management science or statistics concentration must have completed two years of college level calculus. Those admitted to the accounting concentration should plan on up to two additional quarters for undergraduate prerequisite courses that are taken during the first year of the program. Although not required, completion of undergraduate courses in certain areas may qualify the student for exemption from some core courses. (See information under "Exemption from Core Courses" on page 37.)

MBA Core. The following courses are required in each student's program unless an exemption from one or more courses is granted as provided below under the heading "Exemption from Core Courses." All courses are 3 credit hours. The core courses are: Accounting 5010, 5020, 5030; Business Administration 5310; Business Law 5010; Economics 5010, 5020, 5030; Finance 5010, 5020; Management 5010, 5020; Management Science 5010a; Marketing 5010, 5020; Mathematics 5052; Office Administration 5050; Statistics 5010a, 5020.

1Accounting 5020 and 5030 are waived for students who complete the concentration in accounting.
2See notation under the heading "MBA Concentration" in the Management Science Program section (page 44).
3See notation under the heading "MBA Concentration" in the Statistics Department section (page 46).
Concentration and Electives. A concentration area(s) may be indicated on the MBA Program Application or this declaration may be deferred until after matriculation. In any event, selection must be made no later than completion of 27 hours of MBA program coursework. In some cases, selection of an area(s) early in the program is encouraged to facilitate proper course sequencing. Requests for changes in concentration area(s) must be submitted to the Office of Graduate Business Programs.

Among the 8 courses in the concentration/electives block, at least 4 but not more than 6 must be in one of the following concentration areas (for specific courses required in some concentration areas, see departmental sections on following pages):

Accounting
Economics
Finance
Forest Industries Management
Management Science
Marketing
Statistics
Transportation and Logistics

The remaining elective courses (2 to 4) must be in fields outside the concentration area, normally selected from MBA courses offered in other departments, and may comprise a second concentration area of 4 courses. Up to 2 courses (6 hours) in this block may be taken outside the College of Business Administration. No more than 3 courses numbered below 5000 may be included in this 8-course block. Courses numbered below 4000 normally are not approved for the MBA program. Before beginning the concentration/electives part of the curriculum, the student must have his/her program approved by the Office of Graduate Business Programs.

Exemption from Core Courses. A student may be exempted from certain core courses on the basis of having recently completed equivalent undergraduate courses in these subjects with grades of B or higher at a regionally accredited institution. "Recently completed means, for matriculants, completion of the last course or regular use of math tools within two to three years of matriculation, and for other areas within three to five years of matriculation. Courses in this category (and the approximate undergraduate equivalent work) are:

Accounting 5010 (6 quarter hours, fundamentals of financial accounting)
Business Law 5010 (6 quarter hours, legal and social environment of business)
Economics 5010 (9 quarter hours, principles of economics—macro and micro)
Mathematics 5052 (12 quarter hours, including college algebra and calculus. See topics included in Mathematics 5051 and 5052)

In addition to the above, a graduate of an AACSB accredited undergraduate business program may request exemption from one or both of the core courses in the area of his/her undergraduate major field, provided at least 30 quarter hours (20 semester hours) of course work was completed in the major area no more than five years prior to matriculation, and a grade average of 3.0 or higher (on a 4.0 scale) was earned for all courses in the major.

Students requesting exemption must petition the appropriate department head. A minimum of 60 quarter hours of graduate credits is required to earn the degree. If a student qualifies for exemption from a course in addition to those provided for in the two categories described above, whether by proficiency examination or otherwise, an additional course approved by the Office of Graduate Business Programs will be included in the student's curriculum for each such exempted course so as to meet the 60-hour minimum requirement.

Students holding degrees from foreign institutions normally may not be exempted from taking core courses.

Transfer Credits. Graduate level courses taken at other AACSB accredited institutions that otherwise conform to University policy (page 15) may be credited toward MBA degree requirements within the following limits:

MBA Core: 6 hours
Concentration Area: 3 hours (provided at least 12 hours of coursework at this institution are included in each concentration area)
Elective Area: 3 hours

The maximum number of hours that may be transferred is 9 quarter hours.

Other Requirements. The Application for Admission to Candidacy (see page 19) must be approved by two faculty members in the student's area(s) of concentration and the Associate Dean for Graduate Programs in the College of Business Administration, signed by the department head, and submitted to the Graduate Office.

To qualify for the degree, the student must achieve a B average (3.0) or above in MBA core courses required in his/her program, a B average or higher in courses comprising the concentration area(s) and a B average or higher in the overall program. In lieu of passing a written comprehensive examination, the student must satisfactorily demonstrate his/her ability to analyze and solve multi-functional problems of the administrative processes and policy determination and to integrate the concepts of the various disciplines embodied in the curriculum of the program. The student is tested in these areas in the courses of the MBA core, particularly in the capstone course, Business Administration 5310—Business Policy, as well as in work required in the concentration areas.

Application and Admission. Applications are accepted to begin the full-time program in the summer semester for those who have an undergraduate degree in an area other than business and in the fall for students who hold an undergraduate business degree.

APPLICATION DEADLINES
Note: Students are admitted for Summer and Fall quarters only.
Application deadline for
Summer Quarter Admission April 1
Fall Quarter Admission July 1

To obtain application materials, write or call:
Associate Dean
Graduate Business Programs
College of Business Administration
The University of Tennessee
Knoxville, TN 37996-0570
Telephone: (615) 974-5033

There are no admissions for spring or winter quarters. To be considered at admission sessions, the applicant's file must be complete. A complete application includes the Graduate School application, transcripts of prior college work, the MBA program application, two applicant evaluations and the GMAT score report. The first two items should reach The Graduate School 10 days before the MBA application deadline to allow for internal processing. Other items should reach the Office of Graduate Business Programs by the deadline date.

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 Graduate Record Exam, (3) financial need, and (4) 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.

Dual J.D.-MBA Program

The College of Business Administration and the College of Law offer a coordinated dual program leading to the conferment of both Doctor of Jurisprudence and the Master of Business Administration degrees.

Admissions. Applicants for the J.D.-MBA program must make separate application to, and be competitively and independently accepted by, the College of Law for the J.D. degree and the Graduate School and College of Business Administration for the MBA degree, and by the Dual Degree Committee. Students who have been accepted by both colleges may apply for approval to pursue the dual program anytime prior to, or after, matriculation in either college. Such approval will be granted, provided that dual program studies be started prior to entry into the last 28 semester hours required for the J.D. degree and the last 24 quarter hours required for the MBA degree.

Curriculum. A dual program candidate must satisfy the graduation requirements of each college. Students withdrawing from the dual program before completing 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 8 semester hours of credit toward the J.D. degree for acceptable performance in a maximum of 12 quarter hours of approved graduate level courses offered by the College of Business Administration. Three of the 12 quarter hours must be earned in Accounting 5030 or a more advanced accounting course.

1Not available to students whose undergraduate major was not accounting. Such students should choose another area or apply for admission to the Master of Accountancy program. (See page 40).

2Available to residents of West Virginia under terms of the Academic Common Market. (See page 36).
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 Tennessee DBA program is highly flexible, offering a wide array of major and collateral options. 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 five areas of concentration offered in the DBA program:

- Accounting
- Finance
- Management
- Marketing
- Transportation and Logistics

More detailed information concerning these specific areas is available by writing directly to each department chairperson.

**Degree Requirements.** Doctoral students must file a program of study that has been approved by the temporary doctoral advisory committee and the Associate Dean for Graduate Business Programs by the end of the second quarter of coursework after entry into the program. 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:

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

B. **Program Prerequisite Areas.** Students must complete appropriate courses at the graduate level, or other approved concentrations of coursework, in the following areas:

- Accounting
- Behavioral Science
- Finance
- Management
- Marketing
- Business Policy
- Economics
- Calculus
- Computer Science
- Statistics

All work in the above areas is subject to approval by the temporary Doctoral Advisory Committee for Graduate Business Programs. Specific majors may have prerequisites not listed above.

C. **Economics.** Economics 5110-20 (or equivalent) is required, except that Management 5619-20 (or equivalent) may be substituted with prior approval.

D. **Research Methods.** A minimum of 15 quarter hours of graduate research methods must be completed. At least eight quarter hours in statistics courses beyond Statistics 5050 are required. The remaining 9 quarter hours can be completed in additional statistics (not to include Statistics 5050) courses or in other areas such as research methodology, management science, computer science, econometrics, and psychometrics.

E. **Major Area.** The major area of concentration is the focal point of the DBA program. Students are expected to master the literature and research techniques in their concentration area, and to do quality research as evidenced by the preparation of an acceptable dissertation. A minimum of 18 quarter hours of coursework is required, including at least 9 hours of doctoral seminars. Graduate work in the major field taken at other institutions is considered by the temporary doctoral advisory committee in approving the specific coursework required. Available major areas are: accounting, finance, management, marketing, and transportation/logistics.

F. **Collateral Area.** A minimum of 12 quarter hours of coursework is required in an area outside, but complementary to, the major area. The student may choose the collateral area from one of the following: one of the five major business areas listed above, economics, statistics, or a related area in another school or college of the University.

**Comprehensive Examinations.** Comprehensive written examinations over the major and collateral areas are required of each person seeking candidacy for the DBA degree. The major area examination is administered in two sessions of approximately four hours each and the collateral area examination in one session of approximately four hours. Written examinations may be supplemented with oral examinations. For a doctoral student having a collateral area in the College of Law, the results of only an oral examination may be deemed acceptable. Scheduling of comprehensive examinations is coordinated through the Office of Graduate Business Programs.

With the passing of either the major or collateral area examination, the other examination must be passed within the next 13 months. Comprehensive examinations are generally offered during the fall and spring terms.

**Admission to Candidacy.** Students may apply for admission to candidacy for the DBA degree 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.

Doctoral students are advised to give serious attention early in their program to the composition of their doctoral committee. In accordance with Graduate School policy, the student and the major professor identify a doctoral committee composed of at least four faculty members, three of whom, including the chair, must be approved by the Graduate Council to direct doctoral research. When the doctoral committee has been formed, the temporary doctoral advisory committee ceases to exist.

Admission to candidacy must be approved at least two full quarters prior to the date the degree is conferred (admission in the fall quarter permits graduation in the following spring quarter). Admission to candidacy must occur no later than four years after the student enters the program.

Application for admission to candidacy must include a listing of all courses taken in each of the fields required for the degree (business functional areas, basic disciplines, concentration area and collateral 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.
Applicants for management science and either the GMAT or the Graduate Record Examinations may be obtained from most colleges and universities. Scheduled dates and locations for taking these examinations should be submitted at least three months prior to desired entry date.

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.

Minimum Academic Performance Standards

A graduate student in the College of Business Administration whose grade point average at any point is below 3.0 shall be placed on probation. A student on probation shall 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 12 quarter hours of course work attempted which is specified in the student’s degree program. Exceptions to this policy may be made only with the approval of the Associate Dean for Graduate Programs of the College of Business Administration upon recommendation of the student’s faculty committee.

Admission Requirements

General admission requirements for The Graduate School are stated on pages 10-11. M.Acc., MBA and DBA applicants are required to take the Graduate Management Admission Test (GMAT). Applicants for programs in economics, management science, and statistics may submit results of either the GMAT or the Graduate Record Examination (GRE) aptitude portion. Applicants for management and statistics courses must have completed at least two years of college level calculus 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).

In addition to procedures required for admission to The Graduate School (pages 10-11), M.Acc., MBA and DBA applicants must submit additional information on forms provided by the College of Business Administration. The application for all programs and supporting materials should be submitted by the time of enrollment.

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.

Fellowships and Assistantships

Fellowships. Information concerning non-service fellowships administered by the College as well as application blanks may be obtained from the Graduate Office. Information on College-administered fellowships is available from the Office of Graduate Business Programs in the College of Business Administration.

Assistantships. A limited number of teaching assistantships and assistantships that require from 10 to 20 hours of service per week are available through the departments of the College. Remuneration includes payment of fees and out-of-state tuition as well as monthly stipend. Awards are generally made on the basis of scholarship and performance on the admission test. Application forms may be obtained in any of the departments or from the office of the Associate Dean for Graduate Programs. Applications must be received by March 1 for consideration of assistantships and fellowships to be awarded for the following fall term.

Center for Business and Economic Research

The staff of the Center for Business and Economic Research engages in studies of the business and economic environment in Tennessee, the Southeast, and the nation. The Center serves the business community, state government, individuals, and the University through dissemination of various kinds of economic and socioeconomic information and supports the faculty of the College in seeking funding for research projects. Staff members conduct research in regional economics, public finance, and areas related to socioeconomic problems in the region. The Center publishes the results of its own research and that of others in monograph form so that significant developments in the various business disciplines and economics can achieve widespread exposure. In addition, the Center staff does contract research on business and economic problems for governmental organizations and private industry. The Center publishes the Tennessee Statistical Abstract and quarterly the Survey of Business. The Center is a member of the Association for University Business and Economic Research.

Management Development Programs

The Management Development Programs Department offers a variety of programs ranging from executive programs to management seminars and customized "in plant" programs.

The four-week Tennessee Executive Development Program (TEDP) is designed to provide extensive continuing educational opportunities for executives from firms and organizations in Tennessee, the South, and the nation. The major objective of the program is to prepare and develop executives for increasingly higher levels of management responsibility and to sharpen existing executive skills needed for comprehensive decision making and leadership. Other major aims of the TEDP are to teach the fundamentals of analytical thinking and the use of decision tools, and to examine the economic, political, technological and other environmental factors affecting the firm's operations.

TEDP is offered twice yearly, and enrollment is limited to 36 participants per session. The participants usually come to campus for a total of four weeks spread over a three-month period. This arrangement provides executives with extensive opportunities to exchange ideas and operational concepts with contemporaries in other business areas and with TEDP faculty as well.

The faculty for the TEDP consists of senior professors who teach business-related subjects in the University's graduate programs and nationally recognized professors from other institutions. Each participating faculty member has extensive experience in either consultation with or actual operation in business and industry.

The three-week Institute for Productivity Through Quality teaches the very successful Deming taught the Japanese after World War II.

Departments of Instruction

Accounting

J. E. Kiger (Head), Ph.D. Missouri, C.P.A.

Accounting

MAJOR DEGREE

Accounting

M. Acc.

Professors:


Associate Professors:

C. E. Slagle, M.S. Tennessee, C.P.A.; J. H. Scheiner, Ph.D. Ohio State, C.P.A.

L. E. Townend, Ph.D. Texas, C.P.A.

and the Associate Dean for Graduate Business Programs before submission to The Graduate School.

Dissertation (minimum of 36 quarter 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.

Grade-Point Average. A student must maintain a cumulative GPA of 3.0 or higher in graduate courses. However, maintaining a 3.0 GPA does not guarantee the student will be allowed to continue in the doctoral program if there is overriding evidence that the student does not show promise and should be terminated from the program.

Other Requirements. For information concerning program admission requirements, academic performance standards, fellowships and assistantships, and general rules and regulations of The Graduate School, see other parts of the College of Business Administration section and the first section of the catalog, "The Graduate School." Also see "Academic Common Market," page 36.

Minimum Academic Performance Standards

A graduate student in the College of Business Administration whose grade point average is 3.0 or higher shall be placed on probation. A student on probation shall be allowed to continue in the doctoral program if there is overriding evidence that the student does not show promise and should be terminated from the program.

Other Requirements. For information concerning program admission requirements, academic performance standards, fellowships and assistantships, and general rules and regulations of The Graduate School, see other parts of the College of Business Administration section and the first section of the catalog, "The Graduate School." Also see "Academic Common Market," page 36.

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Departments of Instruction

Accounting

J. E. Kiger (Head), Ph.D. Missouri, C.P.A.

Accounting

MAJOR DEGREE

Accounting

M. Acc.

Professors:


Associate Professors:

C. E. Slagle, M.S. Tennessee, C.P.A.; J. H. Scheiner, Ph.D. Ohio State, C.P.A.

L. E. Townend, Ph.D. Texas, C.P.A.
MBA Concentration: Accounting

DBA Concentration: Accounting

Minimum Course Requirements for MBA

Concentration: Accounting 5110, 5210, 5211, 5420, and two of the following: 5320, 5330, 5340.

All Master of Business Administration students electing a concentration other than Accounting are required to take a minimum of 6 quarter hours of graduate level accounting in addition to Accounting 5010 or its equivalent. In those instances where Accounting 5020 and/or 5030 would result in substantial duplication of accounting work previously taken, the student shall not be permitted to earn credit in the same courses, but must select an equivalent number of graduate accounting hours in lieu thereof. Recommended courses include Accounting 5110, 5120, 5210, 5220, 5420, 5510, and 5640.

5002 Non-Thesis Graduation Completion (3-15)

Required for the non-thesis student not otherwise registered during any quarter when such a student uses university facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. 3/50/0, 0/20.

5010 Financial Accounting (3) Introduction to accounting models, firm and accounting information system. Not available to students with credit for 2110-20 or equivalent. F, Sp.

5020 Corporate Reporting Problems (3) Analysis of uses and limitations of financial accounting models of the firm. Emphasis on internal and external uses of general purpose financial reports. Prereq: 5010 or equivalent. F, W.

5030 Managerial Accounting (3) Analysis of accounting models of firm as vehicle for planning and controlling activities. Attention to development of cost data appropriate to managerial decision models. Prereq: 5010, 5210, W, Sp.

5110 Seminar in Accounting Theory (3) Evolution of accounting theory, concepts underlying the practice of accounting, and concepts underlying the philosophy of auditing as related to current auditing issues. Prereq: 4120 or equivalent.

5120 Seminar in Advanced Auditing (3) Critical in-depth consideration of selected financial reporting topics of particular relevance to current auditing practice. Prereq: 4120 or equivalent.

5130 Selected Topics—Current Accounting Practice (3) Critical in-depth consideration of selected financial reporting topics of particular relevance to current auditing practice. Prereq: 5110.

5140 Selected Topics—Current Accounting Theory (3) Critical in-depth consideration of current issues in the financial accounting literature. Prereq: 5110.

5160 Graduate Internship in Accounting (3) Full-time resident professional employment for one academic quarter involving qualified job experience written report of responsibilities, and evaluation of student performance. Prereq: Consent of instructor.

5210 Seminar in Advanced Managerial Cost Accounting (3) Advanced study of concepts and current issues impacting on development and practice of managerial cost accounting. Cost allocation, planning, controlling, under conditions of uncertainty, and responsibility accounting concepts. Prereq: 4230 or consent of instructor.

5220 Budgetary Planning and Control Systems (3) Alternative approaches to organizing of planning and control systems to meet organizational needs and objectives. Control systems and corporate structures, discretionary expense centers, profit centers, investment centers, transfer pricing, and control in not-for-profit organizations. Prereq: 5210 or 5030.

5310 Auditing Concepts (3) Concepts and theory of auditing, environment of internal and external auditing, nature of evidence, internal control evaluation, and reporting. Not intended for persons who have credit for auditing course. Prereq: 3130, 3975 or consent. Statistics 4415 or equivalent.

5320 Advanced Auditing (3) Case-oriented, including audit of specific asset, liability, revenue and expense accounts. Emphasis on reporting, data processing, statistical sampling, and internal auditing. Prereq: 4110 with C or better. (Available only to MBA students who do not have credit for 4120.)

5330 Advanced Income Tax (3) Federal income taxation with emphasis on tax planning and research. Prereq: 3120 with C or higher; 3430 with C or higher. (Available only to MBA students who do not have credit for 4430.)

5340 Consolidations and Business Combinations (3) Theory and practice of accounting for interrelated business entities—domestic and foreign. Not intended for persons who have credit for a course with a similar content. Prereq: 3130.

5420 Tax Research (3) Development of expertise in tax research utilizing tax service, tax periodicals, legal cases, and other available sources. Includes individual research projects. Prereq: 4430 or equivalent.

5430 Tax Planning (3) Advanced study of income tax problems emphasizing alternatives available to minimize tax liability compatible with achieving taxpayer objectives. Prereq: 4430 or equivalent.

5440 Taxation of Estates and Gifts (3) Transfers at death, inter vivos transfers, life insurance, annuities and employee death benefits, marital and other deductions and exemptions, and estate and gift tax returns. Prereq: 4430. (Not available to students with credit for 4440.)

5450 Taxation of Partnerships and Partners (3) Formation, operation, termination, and liquidation and other special problems of partnerships. Prereq: 5420.

5460 Taxation of Corporations and Shareholders (3) Organization and structure, distributions, liquidation, reorganizations, and special problems including Subchapter S Corporations and Personal Holding Companies. Prereq: 5420.

5480 Tax Policy (3) Current policies explored through historical development and current status of various types of taxes and tax administration. May be repeated. Admission by consent of department head. Prereq: 5430 or 5440.

5510 Not-for-Profit Accounting (3) Theory and practice of accounting for not-for-profit organizations, financial reporting, measures of output and accomplishment, and financial and performance auditing for nonprofit entities. Prereq: 9 hrs of accounting and consent of instructor.

5540 Seminar in Accounting Information Systems (3) Literature on accounting information systems and advanced systems analysis and design concepts informational needs of other functional areas of business and interfacing of these areas. Prereq: 4530 or equivalent.

5910-20-30 Accounting Seminar (1, 1, 1) Research and discussion of contemporary issues in practice of accounting. May be repeated. Admission by consent of department head. S/NC only.

5970 Seminar in Accounting Research (3) Integration of areas of financial, managerial, tax, and auditing, including directed problem-oriented research in selected topics. Prereq: 5110, 5120, 5210, 5420. (Not available to MSA students.)

5990 Individual Research in Accounting (3) Directed research in a topic of mutual interest to student and faculty member. Prereq: Consent of department head in quarter prior to anticipated enrollment. May be repeated. Maximum 6 hrs.
6000 Doctoral Research and Dissertation (3-15) P/NP only. E

6110-20-30 Doctoral Seminar in Accounting (3, 3, 3) Analysis of issues reflected in accounting literature. Prereq: 9 hrs of graduate credit in accounting and consent of instructor.

Business Law

5010 Legal and Social Environment of Business (3) Survey of legal and quasi-legal institutions with emphasis on those which have particular significance to business; basic legal notions and principles that pertain to business management. Not available to students with credit for 4110-20 or equivalent. F. W. S. A.

5130 Administrative Regulation of Business (3) Federal Register System and Administrative Procedure Act and their relationship to business. How a regulation is made and enforced. Other legal controls of administrative agencies. Not available to students with credit for 4130 or equivalent. Prereq.: 4120 or 5010 or consent of instructor.

Business Administration
MAJOR DEGREES
Business Administration MBA, DBA

5050 Data Processing in Business (3) Fundamentals of data processing, computer programming and applications, systems design. E.

5310 Business Policy (3) Case studies covering policy formulation and administration: point of departure and middle management, where company-wide objectives are set and departmental policies and activities coordinated: sizing up company situation, determining objectives, developing sound policies, organizing and administering personnel to reach company objectives, continuous administrative reappraisals. Enrollment priority given MBA students in last quarter of their program. Prereq.: All MBA core courses. E.

5410 Business and Its Societal Environment (3) Analysis of current forces and changes in society and interrelation of plans and actions in business and environmental factors. Prereq: Consent of instructor.

5610 Seminar in Applied Business Analysis (3) Application of business concepts and analytical skills to problems of small businesses in community. Student work in teams under supervision of the teaching professor. Prereq.: Consent of instructor. May be repeated. Maximum 6 hrs.

Business Education
See College of Education

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

Professors: W. E. Cole (Head), Ph.D. Texas; R. A. Bohm, Ph.D. Washington (St. Louis); R. L. Bowby, Ph.D. Texas; S. L. Carroll, Ph.D. Harvard; H. S. Chang, Ph.D. Vanderbilt; D. R. Ferrall*, Ph.D. McGill; C. B. Garrison, Ph.D. Kentucky; H. W. Herzog, Ph.D. Maryland; J. F. Holly (Emeritus), Ph.D. Clark; H. E. Jensen, Ph.D. Texas; F. Y. Lee, Ph.D. Michigan State; A. Mayhew, Ph.D. Texas; J. R. Moore, Ph.D. Cornell; W. C. Nellie, Ph.D. London School of Economics; F. D. Qualles, Ph.D. California (Berkeley); G. A. Spilka, Ph.D. Texas.

Associate Professors: D. P. Clark, Ph.D. Michigan State; W. F. Fox, Ph.D. Ohio State; R. Glidewell, Ph.D. Ohio State; H. W. Herzog, Ph.D. Maryland; D. L. Kaseser, Ph.D. Florida; K. E. Phillips, Ph.D. Washington (Seattle); A. M. Schottman, Ph.D. Washington (St. Louis).

Assistant Professors: R. A. Fuller, Ph.D. North Carolina; J. W. Mayo, Ph.D. Washington (St. Louis); K. L. Murphy, Ph.D. Michigan State; H. Thomson, Ph.D. Washington (St. Louis).

THE MASTER'S PROGRAM

The minimum requirements for a graduate major in Economics for the Master of Arts degree consist of the following: (1) Economics 5111-12 and 5121-22, (2) 9 additional hours in economics at the 4000 level or above, (3) a thesis, or an additional 9 hours in economics at the 5000 level or above to be concentrated in one field. Students electing the non-thesis option will be required to pass a final written comprehensive examination.

The requirements for a graduate minor in Economics are as follows: Either (1) 5111-12 and 5121, or (2) 5111 and 5121-22, or (3) with the consent of the head of the economics department, an alternative sequence of 9 hours to meet unusual conditions.

THE DOCTORAL PROGRAM

Subject Area Requirements

1. Students will be required to complete requirements in core subject fields as indicated:
   a. Economic theory: by comprehensive examination or by completion of Economics 5111-12 and 5121-22 with a B average or higher, and successful completion of Economics 6111 and 6121.
   b. Economic history: 6 hours of economic history at the 5000 level or above.
   c. History of economics: Economics 5150 and 3 hours at the 6000 level.
   d. Mathematical and quantitative methods: Economics 5180, 5190, and 5510. The 5510 requirement may be waived for students completing Economics 6170, 6180, and 6190.

   Students must achieve a grade average of B or higher for all courses offered to fulfill requirements of subparagraphs b, c and d, or as an alternative, may petition to satisfy any one or all of these three fields by some other means such as comprehensive examination.

   2. Students will be required to demonstrate their competence by comprehensive examination in three fields with the approval of the department, at least two of which must be selected from the following: economic development; economics of centrally planned economies; economics of labor and human resources; industrial organization; international economic relations and urban economics; a field, as agreed to by the department, combining two or three of the above.

   Exceptions to the foregoing are discouraged but may be petitioned by writing directly to the department head who will decide with the advice of an ad hoc committee of three tenured members of the faculty. This petition is to be submitted at least nine months before the student takes the comprehensive exam in question.

   Course Requirements: Candidates for the Ph.D. degree in Economics will be required to complete a minimum of 72 quarter hours of course work beyond the Bachelor's degree, plus the dissertation which carries 36 quarter hours of credit. At least 54 hours shall be in economics.

   MBA Concentration: Economics. Minimum Course Requirements for MBA Concentration: As approved by the area MBA faculty advisor.

4000 Special Topics (3) Student generated course offered at convenience of department upon student initiative. Subject matter and contents determined by students and instructor with approval of the department.

5000 Thesis (1-15) P/NP only. E

5002 Non-Thesis Graduation Completion (3-15) Required for the non-thesis student not otherwise registered during any quarter when such a student uses university facilities and/or faculty time before the student takes the comprehensive exam. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

5010-20-30 Economics Seminar (1, 1, 1) Research in progress and discussion of selected topics. May be repeated. S/NC only. E

6000 Doctoral Research and Dissertation (3-15) P/NP only. E

ECONOMIC THEORY

4110 Managerial Economics (3) Application of economic theory to business decision making involving emphasis on profit objectives, measurement and forecasting demand and costs, and capital budgeting. Prereq: 2510-20 or equivalent.

4130 Business Cycles (3) Fluctuations in income, employment, prices and the like, taking place over the business system: subjects discussed are the historical facts concerning booms and depressions, statistical methods for analyzing business fluctuations, theoretical explanations of cycles, and policies that have been proposed to combat them. Prereq: 3120 or consent of instructor. Sp.

4150 History of Economic Thought (3) Development of economic thought, tools of analysis, and economics as a social science, together with an analysis of socioeconomic conditions which influenced this development. Period covered: 1776 through 1936. Prereq: 1 yr of principles of economics and consent of instructor. F.

4170-80 Introduction to Mathematical Economics (3, 3) Application of mathematical methods in theoretical study of micro- and macroeconomic phenomena. Designed for beginning graduate students who have limited training in analytic geometry and calculus. Must be taken in sequence. Prereq: 3110 and college algebra, calculus, and analytic geometry or equivalent. F. W.

5010 Introduction to Economic Analysis (3) Analytical tools of macro- and microeconomics for students without prior training in economics. Price determination, national income measurement and determination, and banking system. Not available to students with credit for 2510-20 or equivalent. F., Su.

5020 Managerial Economics (3) Application of economic concepts to business decision making. Analysis and evaluation of demand, cost analysis, pricing behavior, and optimizing techniques. Prereq: 5010 or equivalent. Prereq or coreq: Statistics 5020 or equivalent. F. W.


5110 Fundamentals of Microeconomics (3) Verbal arguments and geometric and algebraic techniques. Theory of consumer behavior and demand; theory of production and supply; and short run theories of profit maximizing firm in both perfectly competitive and monopolistic environments; theory of derived demands for factor services whose major is other than economics. Not available for students with credit for 5111. Prereq: 3110 or equivalent. F.
4420 Economics of Human Resources (3) Analysis of current problems in human resource development and evaluation of policies aimed at their solution. Problems include unemployment, education, hiring, discrimination. Financial aid available. Prereq: 3110 or equivalent. F, W

5111-12 Microeconomic Theory I, II (3, 3) Theory of consumer choice and demand; theory of the firm; theories of factor prices; market structures; derived demand and factor pricing; introduction to welfare economics, capital theory. Should be taken in consecutive quarters. Prereq: 3110 or equivalent; F, W

5120 Fundamentals of Macroeconomics (3) Determination of levels of employment and prices for economy as a whole; relationships between interest rates and money supply, analysis of business cycles, quantity of money, and aggregate saving, investment, and liquidity preference. For students whose major is other than economics. May be repeated with consent of instructor. Prereq: 3120 or equivalent. W

5121-22 Macroeconomic Theory I, II (3, 3) Monetarist and income-expenditure approaches to questions of income and price level determination; applications to contemporary macroeconomic problems. Should be taken in consecutive quarters. Prereq: 3120 or equivalent. W, Sp

5150 History of Economic Thought (3) Development of economic ideas from mercantilists through Alfred Marshall; emphasis given to classical and neoclassical traditions.

5180-90 Mathematical Methods in Economics (3, 3) Techniques of basic concepts in differential and integral calculus, difference and differential equations, linear algebra and stochastic models to topics in economic theory, game theory, linear programming, and decision making under uncertainty. Prereq: 1 yr of calculus. Sp, F

5510 Quantitative Methods in Economic Research (3) Methods of estimation and testing of economic relationships with use of time series and cross section data, with applications to current economic problems. Prereq: Introductory statistics or Statistics 5211 or equivalent. W

5520 Introduction to Econometrics (3) Statistical demand analysis, production and cost analysis, distribution of income and wealth, models of growth and cyclical patterns, macroeconomic applications. Should not be taken by students who contemplate taking Econometrics 6170-80-90. Sp

5810 Financial Markets and Intermediaries (3) (Same as Finance 5810) W

5830 Commercial Banking (3) (Same as Finance 5830) F, Sp

6111 Advanced Microeconomic Theory (3) Consumer behavior, production, and exchange in partial and general equilibrium settings. Prereq: 4170, 4180, 5112, or equivalent. F

6121 Advanced Macroeconomic Theory (3) Theory and techniques of statistical testing of economic hypotheses and construction and estimation of economic models. Review of classical least squares regression, extensions of least squares regression model, and approaches to simultaneous equation models with application to current economic research. Prereq: 5180-90 and 5510 or equivalent. F, W, Sp

ECONOMICS OF CENTRALLY PLANNED ECONOMIES

5310 Economic Systems (3) Study and appraisal of underlying theories and operation of capitalism, socialism, communism, and other economic systems. Prereq: 3110 or equivalent. F, W

6331 Theory and Practice of Economic Planning (3) Leading issues in imperative and indicative planning of economic development. Prereq: Consent of instructor. May be repeated with consent of instructor. F

ECONOMICS OF LABOR AND HUMAN RESOURCES

4420 Economics of Human Resources (3) Analysis of current problems in human resource development and evaluation of policies aimed at their solution. Problems include unemployment, education, hiring, discrimination. Financial aid available. Prereq: 3110 or equivalent. W, Sp

6211 International Economics: Trade (4) Pure theory of classical, neoclassical, and modern international trade. Comparative advantage, free trade, and welfare, and technological change, growth and migration, tariffs and subsidies, and customs unions. Prereq: 5112 or consent of instructor.


6213 International Monetary Economics (4) Theories of exchange rate determination, approaches to balance of payments theory, balance of payments adjustment under alternative exchange rate regimes, economic policy in open economy, international capital movements. Prereq: 5121, 5030, 5120 or consent of instructor.

6231 Development Economics: Theories (4) Study of principal theories explaining economic behavior in less developed countries. Prereq: 21 hrs of undergraduate economics or consent of instructor.

6232 Development Economics: Policies (4) Policies, strategies, and planning techniques used to promote modernization in less developed countries. Prereq: 6231 or consent of instructor.

6241 Economic Development: Western Impact on Asia and Africa (4) Studies of the impact of advanced Western economic development on less developed countries of Asia and Africa. Prereq: 6231 or consent of instructor.

6242 Seminar in Economic Development (4) Topics vary with interests of students. Prereq: 6241 or consent of instructor.

6250 Seminar in European Economic History (3) Selected topics in European economic history. Prereq: Consent of instructor. May be repeated with consent of department.

6260 Seminar in American Economic History (3) Selected topics in American economic history. Prereq: Consent of instructor. May be repeated with consent of department.

6270 Seminar in Economic History of the Third World (3) Selected topics in economic history of third world countries. Prereq: Consent of instructor. May be repeated with consent of department.

6290 Seminar in American Economic History (3) Selected topics in American economic history. Prereq: Consent of instructor. May be repeated with consent of department.

6290 Seminar in Economic History (3) Selected topics in economic history of developed countries. Prereq: Consent of instructor. May be repeated with consent of department.

6690 Seminar in Regional Analysis (3) Selected regional economic analysis and evaluation of analysis. May be repeated. Maximum 6 hrs. Sp, A

6690 Seminar in Environment and Resource Economics (3) Topics in environmental quality, natural resource allocation by private markets, and issues in formulating public policy towards environmental problems. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. Sp, A

INDUSTRIAL ORGANIZATION

4350 Industrial Organization Analysis (3) Monopoly and competition in the United States economy, market structure, business behavior, and economic performance and interrelationships. Prereq: 2160. W

4351-52-53 Seminar in Industrial Organization and Public Policy (4, 4, 4) Organization of industry in modern mixed enterprise economy. Problems of monopoly and competition and their social control. Prereq: Consent of instructor. Sp, A

MONETARY ECONOMICS

5820 Monetary Theory and Policy (3) Relationship of money, credit and liquidity to income, interest rates, employment and prices as well as examination of methods of monetary policy on economic activity. Prereq: 5200 or equivalent.
5020 Financial Management II (3) Development of theories of capital budgeting, capital structure, and dividend policy under conditions of uncertainty. Various tools to be used in corporate risk analysis into financial decision making process. Prereq: 5010, Economics 5020. Prereq or coreq: Statistics 5020.


5240 Investment Analysis (3) Principles and techniques for evaluation of investment desirability of marketable securities, with emphasis on common stocks and corporate bonds. Financial statement analysis, of price-earnings ratios, and recent mathematical valuation models. Prereq: 5020 or consent of instructor.

5420 Portfolio Analysis and Management (3) Development of basic concepts and varied methodologies in selection, management, evaluation, and review of asset portfolios. Modern analytical and statistical techniques. Prereq: 5420 or consent of instructor.

5510 International Financial Management (3) Analysis of international finance aspects of the financial management of multi-national firm. Integration of relevant topics from corporate finance, international financial markets, international monetary theory, and management of foreign exchange risk. Prereq: 5020.

5610 Real Estate Finance (3) Valuation, financial management of real estate property. Tax aspects of acquisition, operation and sale. Syndication and financing methods. Prereq: 5010 or consent of instructor.

5620 Economic Analysis of Housing and Urban Land Markets (3) Intrametropolitan mobility, neighborhood transition and federal housing policy. Difficulties in obtaining efficient and equitable solutions to a variety of urban problems. Relevance of empirical and theoretical economics literature to policy makers and entrepreneurs. Prereq: Economics 5020 or consent of instructor.

5630 Real Estate Investment Analysis (3) Application of contemporary appraisal and feasibility analysis to real estate investments, and computer models for discounted cash flow and mortgage equity analysis. Prereq: 5010 or consent of instructor.

5810 Financial Markets and Intermediaries (3) Capital formation and allocation in the economy. Role of financial intermediaries and markets. Theory and structure of interest rates. Analysis of money and bond markets; study of international financial markets. Prereq or coreq: 5010. (Same as Economics 5810.)

5830 Commercial Banking (3) Analysis of management policies of financial institutions, including assets, liabilities and capital management. Description of legal, economic, and regulatory environment, and implications for management. Examination of bank structure and competition, and changing trends in the U.S. financial system. Prereq: 5010. Prereq or coreq: Economics 5830. (Same as Economics 5830.)

5900 Research in Finance (3) Directed research on topic of mutual interest to the student and staff member. Prereq: 5020. May be repeated. Maximum 6 hrs.

6000 Doctoral Research and Dissertation (3-15) P/NP only. E

5210 Personnel Management (3) Analysis and appraisal of the personnel function. F
5220 Wage and Salary Administration (3) Analysis of pricing, setting, and application by prearrangement of with supervising faculty member. May be repeated. Maximum 6 hrs. S/NC or letter grade. E
5250-60 Industrial and Organizational Psychol­ogy (1-3, 1-3) Readings in industrial and organiza­tional psychology. Available only by prearrangement of with supervising faculty member. May be repeated. Maximum 6 hrs. S/NC or letter grade. E
5280 Independent Study, Project or Research in Management (1-3) Topic of mutual interest to student and faculty member. Available only by prearrangement of with supervising faculty member. May be repeated. Maximum 6 hrs. S/NC or letter grade. E
5290 Management Problems in Industrial Re­search and development and engineering programs, and comparable programs in which professional personnel predominate. F, A
5410-20-30 Production Management (3, 3, 3) Quantitative approach to solution of production management problems. Prereq: 5200 or consent of instructor. F
5610-20 Organizational Behavior (3, 3) Behavioral methodology and perspective, including review of empirical behavioral research in organizations. Must be taken in sequence. F, W
5630 Research Methods in Management (3) Methodological issues in management research. Re­view of experimental design, measurement problems, data sources and collection, and application of statistical methods, followed by critique of student research proposals. Prereq: DBA student status or consent of instructor. S/NC only. Sp
5710 International Business Management (3) Analysis of environment of international business firms and impact of internal and external factors on managerial decisions. Sp
5810 Energy Management: Theory and Practice (3) Energy resources and energy resources in operating systems; decision criteria, trade-offs, system analy­sis, energy audits, technical parameters, conserva­tion methods, worldwide energy supply and demand, new energy technologies. E
6000 Doctoral Research and Dissertation (3-15) P/NP only. E
6120 Advanced Organizational Theory (3) Analy­sis of functioning of complex organizations: struc­ture, culture, and standards. F
6130 Seminar in Contemporary Management Issues (3) Contemporary management policy issues. May be repeated. E
6260-60-70 Seminar in Industrial and Organiza­tional Psychology (3, 3, 3) Advanced problems in organizational psychology. Areas include performance evaluation, executive development, group process, and morale. (Same as Psychology 6250-60-70.) W
6380 Seminar in Industrial and Organizational Psychology (3) (Same as Psychology 6380.) F
6900 Field Work in Industrial and Organizational Psychology (1-15) Supervised practice. One credit hr for each 30 hrs of such practice. Maximum 15 credits. (Same as Psychology 6900.) F
Management Science

MAJOR Management Science

Ph.D.

DEGREE

Management Science

Professor:
R. S. Garfinkel (Chairperson), Ph.D. Johns Hopkins.

Associate Professors:
J. H. Ho, Ph.D.; D. Strand; R. E. Rosenthal, Ph.D.

Georgia Institute of Technology.

Management Science Committee:
Members of the Management Science faculty and in addition: J. S. Bradley, Mathematics; K. C. Gilbert, Management; E. Glustoff, Economics; B. A. Ratlon, Geography; R. Shrivastava, Finance; C. C. Thippen, Statistics; M. G. Thompson, Computer Science.

MBA CONCENTRATIONS

For students whose MBA concentration area is Management Science, the MBA Core is revised as follows: substitute Management Science 5310 for 5010, Statistics 5110 for 5010, and with approval of student's advisor, substitute Statistics 5120 for 5020. The concentration area must include Management Science 5330 and 5340.

MASTER OF SCIENCE PROGRAM

See page 97 for details of the Master of Science program in Management Science.

THE DOCTORAL PROGRAM

The Ph.D. program in Management Science is designed to prepare students for research, and teaching related to the application of management tools to complex decision making. Three primary objectives of the program are:

1) to provide, through management science course work, a thorough knowledge of common Management Science/Operations Research mathematical models and their uses,

2) to provide sufficient advanced study in a supporting area to qualify the graduate for a joint faculty position in the supporting area and management science. The candidate may choose from the business functional areas (accounting, finance, marketing, production management, and transportation and logistics) or other disciplines, (e.g., computer science, forestry, ecology, and public administration),

3) to develop in the student, through course work in mathematics, statistics, and computer science, a high degree of mathematical maturity which will serve the graduate well throughout a lifelong career, whether in management, research, or teaching.

Degree Requirements. General University requirements for the doctoral degree are stated on page 20.

Course work: 30 quarter hours of graduate credit (exclusive of thesis or dissertation) is required. The candidate must complete a minimum of 36 quarter hours at The University of Tennessee, Knoxville, at least 9 of which must be at the 6000 level. 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 24 to 30 quarter hours of course work in the applied concentration area.

Qualifying Examinations. The student must demonstrate mastery of probability theory and statistical inference (Statistics 5110-20-30) by passing a written qualifying examination. Mastery of 18 to 21 quarter hours in mathematical course work must be demonstrated by passing a written qualifying examination. Topics normally include numerical analysis (either Mathematics 4225, 4245, 4260, 4665, or Mathematics 5655-65-75) and real analysis (Mathematics 4510-20-30). Other options may be approved. In exceptional circumstances the faculty will consider waiving the mathematics and/or statistics qualifying examinations.

These requirements are completed by the end of the first year of the program.

There is no foreign language requirement. Comprehensive examinations. 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 36 quarter hours of Management Science 6000, 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 determines appropriate. This oral examination is beyond the minimum 72 hours of course work, normally completed in the third year of the program.

Prerequisites for Management Science Courses. The Master of 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 course work does not match the prerequisites are encouraged to seek the instructor's guidance and consent to enroll.

5000 Thesis (1-15) P/NP only. E

5002 Non-Thesis Graduation Completion (3-15) Required for the non-thesis student not otherwise registered during any quarter when such a student uses university facilities and/or faculty time before degree is completed. May not be used toward de­gree requirements. May be repeated. S/NC only. E

5010 Quantitative Analysis for Management Deci­sions (3) Assignment, transportation and general linear programming problems; decision theory, Mark­ov chains and queues, optimization and computer science, a high degree of mathematical maturity which will serve the graduate well throughout a lifelong career, whether in management, research, or teaching.

Degree Requirements. General University requirements for the doctoral degree are stated on page 20.

Course work: A minimum of 72 quarter hours of course work taken for graduate credit (exclusive of thesis or dissertation) is required. The candidate must complete a minimum of 36 quarter hours at The University of Tennessee, Knoxville, at least 9 of which must be at the 6000 level. 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 24 to 30 quarter hours of course work in the applied concentration area.

Qualifying Examinations. The student must demonstrate mastery of probability theory and statistical inference (Statistics 5110-20-30) by passing a written qualifying examination. Mastery of 18 to 21 quarter hours in mathematical course work must be demonstrated by passing a written qualifying examination. Topics normally include numerical analysis (either Mathematics 4225, 4245, 4260, 4665, or Mathematics 5655-65-75) and real analysis (Mathematics 4510-20-30). Other options may be approved. In exceptional circumstances the faculty will
College of Business Administration/Marketing and Transportation

5000 Doctoral Research and Dissertation (3-15) P/NP only. E

6110-20 Models for Production Systems (3, 3) Seminar providing research practice to enhance professional development of doctoral students. Investigation of existing mathematical models for production processes and opportunities for original research.

6210-20 Network Flows (3, 3) In-depth treatment of widely applied network optimization algorithms including transportation and transshipment; primal-dual and primal basis-tree methods; multi-commodity, multi-terminal and dynamic flows; flow with gains; and other advanced topics. Prereq: 5310 or equivalent. A

6310 Integer Programming (3) Theoretical and computational aspects of linear programming with integer variables, branch and bound, cutting plane, and group theoretic algorithms. Prereq: 5310 or equivalent. A

6410 Large Scale Mathematical Programming (3) Development of solution strategies for linear programming problems that have many constraints, many variables or extremely sparse constraint matrices. Prereq: 5310 or equivalent. A

6510 Nonlinear Optimization (3) Solution of constrained and unconstrained nonlinear optimization problems focusing on algorithms that have performed well in recent practice. Prereq: 5310 or equivalent. A

6510 Markovian Decision Models (3) Formulation and analysis of Markov chain models; Markov chain models in which transition probabilities depend on the formation, application and solution through policy iteration. Stochastic dynamic programming models in continuous time. Prereq: 5330. F

6620 Queuing Models (3) Application and mathematical analysis of models of congestion. Basic birth-death process models, other Markovian models; non-Markovian models for systems with general service or arrival patterns, priority customers or other complicating assumptions, queues in series. Prereq: 5330 or Mathematics 4750-60. Sp

6710 Location Models (3) Application of linear, nonlinear and network optimization techniques to problems of optimal location of new facilities. Prereq: 5310 or equivalent. A

6810 Special Topics (3) Prereq: 5310-20-30 and consent of instructor. May be repeated. Maximum 9 hrs.

6910-20-30 Management Science Seminar (1-3-1, 3-1-3) Subjects selected from current management science literature. F; W; Sp

Marketing and Transportation

D. J. Barnaby (Chairman), Ph.D. Purdue

Marketing


DBA Concentration: Marketing.

Minimum Course Requirements for MBA Concentration: 5300, 5350, 5400, 5410.

5002 Non-Thesis Graduation Completion (3-15) Required for the non-thesis student not otherwise registered during any quarter when such a student uses university facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E


5020 Marketing Strategy and Decision Making (3) Management of basic marketing functions. Integration of decisional functional areas into development of marketing strategy, both domestic and international. Prereq: 5010. Prereq or coreq: Economics 5020; Statistics 5020. Sp, Su, W

5120 Sales Force Management (3) Basic communication theory affecting objectives and problems of sales force management. Recruitment, selection, training, motivation, evaluation, and control of sales force. Prereq: 5020. F

5220 Promotion Management (3) Management of promotional activities within firm: advertising, publicity, and sales promotion. Emphasis on advertising, setting objectives, budgeting, segmentation, media selection, and evaluation of effectiveness. Prereq: 5020. Sp

5230 Analysis and Design of Marketing Systems (3) Macro and micro approach to marketing systems. Conceptual framework for examining marketing agency and channel interrelationships, public policy, cost and efficiency, and innovation in marketing from viewpoint of decision maker. Prereq: 5020. Sp

5300 Marketing Research (3) Investigation and solution of problems; application of research methods to functional areas of marketing. Research concepts, methods, and techniques. Prereq: 5020; Statistics 5010. F

5350 Buyer Behavior Analysis for Marketing (3) Buyer behavior patterns with emphasis on implica
tions for marketing analysis and executive action. Marketing and behavioral sciences. Prereq: 5020. F

5400 Analyzing Market Opportunity for Marketing Decisions (3) Basic determinants of opportunity within markets, framework for identifying and organizing information required to assess market opportunity. Approaches to analyzing buyers in markets, forecasting, evaluating demand, analyzing industry-channel-competitor service. Emphasis on applying market opportunity analysis results to marketing decisions. Prereq: 5020. W

5410 Advanced Marketing Strategy (3) Components of marketing strategy including development of marketing mix. Consideration of alternative strategies. Coordination and control of marketing activities. Prereq: 5300 and 5350. W

5450 International Marketing Management (3) Development and management of international marketing programs. Problems involved in marketing goods and services in foreign markets. Political, cultural, and economic conditions in different countries. Prereq: 5020 and 5300. Maximum 6 hrs. E

5990 Research in Marketing (3) Directed research on subject of mutual interest to student and staff members. Prereq: 5020 and 5300. May be repeated. Maximum 6 hrs. E

6000 Doctoral Research and Dissertation (3-15) P/NP only. E

6505 Macro/Theoretical Foundations of Marketing (3) Fundamental nature and history of marketing processes. Role of marketing theory in developing marketing discipline and in research process. Environmental forces influencing future development of marketing decision making. Prereq: Consent of instructor. A

6101 Design and Measurement in Marketing Research (3) Advanced design and measurement issues. Theoretical scaling considerations, applications of multidimensional scaling techniques, and conjoint analysis. Prereq: Consent of instructor. A

6150 Marketing Research Applications (3) Application of multiple methods and models to functions of marketing. Prereq: Knowledge of multivariate analysis and consent of instructor. A

6200 Buyer Behavior (3) Behavioral processes of individuals and groups in roles as buyers of goods and services. Prereq: Consent of instructor. A

6300 Marketing Decision Models (3) Model building process including application of variety of models to marketing decision making. Bayesian analysis, simulation models, brand switching models, stochastic models, dynamic models, and mathematical models. Prereq: Consent of instructor. A

6350 Current Topics in Marketing (3) Specific topics will vary with each course offering, but could include: nonbusiness marketing applications, macroenvironmental issues, market segmentation, children's television advertising, international marketing issues, marketing channels, and related models. Prereq: Consent of instructor. A

Transportation and Logistics


Associate Professors: E. R. Cadotte, Ph.D. Ohio State; J. H. Foggia, DBA Indiana.

DBA Concentration: Transportation and Logistics.

DBA Concentration: Transportation and Logistics.

Minimum Course Requirements for MBA Concentration: 18 credit hours required including 5010, 5110, 5130, 5220. Transportation 5010 is prerequisite to all other graduate courses in this area.

5002 Non-Thesis Graduation Completion (3-15) Required for the non-thesis student not otherwise registered during any quarter when such a student uses university facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

5010 Survey of Transportation and Logistics (3) Intensive survey of logistical demands made by society and specific users on nation's transportation system, problems facing carriers and government. Sp


5120 Management and the Pricing Problem (3) Critical analysis of application of economic theory and regulatory restraints to pricing of carrier services. Sp

5130 Carrier Transportation Management (3) Analysis of major transportation modes and their managerial strategies. Consideration of how social, technical, legal, and economic factors affect top level decision making. Application of general business, marketing, finance, and statistical decision processes to transportation decision making in uncertain environment. F

5220 Logistics Systems Management (3) Development of strategy for management of logistical systems. Emphasis on executive level integration of logistics operations with marketing, production, and other decision areas. Practical applications through a case approach and simulation game. Prereq: Management 5020. W

5510 Urban Transportation Policy (3) Movement of people, goods and information in urbanized areas.
with special emphasis on formulation of national, state and local policy. Emphasis on evolving new urban transportation concepts. W

5810 International Transportation Policy (3) Comparative analysis of transport systems in other countries. Analysis of U.S. policy relative to international transportation. Sp

5910 Advanced Law and Regulation (3) Legal rights and responsibilities of shippers and carriers. Analysis of decisions of regulatory commissions, courts, and principles of law arising from these decisions. W

5990 Independent Study in Transportation/Logistics (3) Directed study in surface and air transportation, national transportation policy, transportation/logistics research developments, or subject of particular interest to student and faculty. May be repeated. Maximum 6 hrs. E

6000 Doctoral Research and Dissertation (3-15) P/NP only. E

6110 Seminar in National Policy (3) Critical analysis of contemporary national transportation policy issues. Prereq. 5110. F

6210 Seminar in Transportation and Logistics Models (3) Analysis of contemporary models and methodologies in transportation and logistics research. Relative emphasis on topical coverage at discretion of instructor. Prereq. Management Science 5010; Statistics 5010 or equivalent. E

6220 Research Methodology in Transportation and Logistics (3) Philosophy and design of research in transportation and logistics.

Statistics

MAJOR

DEGREE

Statistics

M.S.

Professors:
L. Sylvestre (Chairman), Ph.D. Stanford; D. S. Chambers (Emeritus), M.B.A. Texas; R. A. McLean, Ph.D. Purdue; J. W. Philpott, Ph.D. Virginia Polytechnic Institute; C. G. Thigpen, Ph.D. Virginia Polytechnic Institute.

Associate Professors:
H. A. Lasater, Ph.D. Rutgers; G. B. Rainey, Ph.D. North Carolina State; R. D. Sanders, Ph.D. Texas; M. S. Younger, Ph.D. Virginia Polytechnic Institute.

Assistant Professor:
S. W. Ward, Ph.D. Virginia Polytechnic Institute.

THE MASTER’S PROGRAM

The Master of Science program in Statistics is designed to provide students with a basic foundation in theoretical and applied statistics for careers as consulting and practicing statisticians. A special industrial statistics concentration is available for students wishing to focus on industrial applications of statistics.

A candidate should possess an undergraduate degree with a background in calculus, but no restrictions are imposed regarding the undergraduate major.

The department offers both thesis and non-thesis options for work toward the degree. With Options I and II, two-thirds of the total hours in each program must be at or above the 5000 level.

Option I. The student must present a minimum of 48 quarter hours of approved coursework to include:

(1) a minimum of 27 hours in graduate statistics courses, and (2) a minimum of 9 hours in collateral work outside the department, and (3) a minimum of 3 hours credit for a directed study project.

Option II. The student may be approved for a thesis option consisting of a minimum of 45 quarter hours to include:

(1) a minimum of 24 hours in graduate statistics courses, and (2) 9 hours credit for master’s thesis. Option I or II must be approved by the department.

An industrial statistics concentration is available within the framework of either option.

MBA CONCENTRATION

For students whose concentration area is Statistics, the MBA Core is revised to substitute Statistics 5110 for 5010. The concentration area must include 5120 and 5130. Normally, Statistics 5250-60-70 are also included which require 3450 as a prerequisite.

Statistics courses numbered 4000 and above presuppose familiarity with the basic probability distributions in statistics and with the general concepts of statistical estimation and hypothesis testing. Students unfamiliar with these concepts should seek advice from a statistics advisor concerning prerequisite course work.


4310 Regression Analysis (3) Linear regression and correlation, multiple regression, stepwise methods, polynomial regression, use of dummy variables. Use of standard regression computer programs. Elementary theory and applications. F, W, Sp

4415 Sampling Techniques and Theory (3) Procedures used in probability sampling for a variety of arrangements of statistical universes and development of estimators and standard errors associated with the sampling schemes. Some properties of estimators. Determination of sample size. Not available for credit to students with credit for 3410. E

5000 Thesis (1-15) P/NP only. E

5002 Non-Thesis Graduation Completion (3-15) Required for the non-thesis student not otherwise registered during any quarter when such a student uses university facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

5010 Probability and Statistical Inference (3) Fundamentals of probability, discrete and continuous probability models, mathematical expectation, and inference concerning means. Prereq. Mathematics 3052 or equivalent and a computer programming course. May not be taken for credit by students who receive credit for 5110. F, W, Sp

5020 Statistical Methods (3) Regression and correlation models, basic time series analysis and forecasting; inferences about one or more proportions, and tests for independence. Prereq. 5010. W, Sp


5110 Introduction to Probability Theory (3) Classical probability and distribution theory. Prereq. Elementary linear algebra and calculus of several variables. F

5120-30 Theory of Statistical Inference (3, 3) Introductory theory underlying common statistical procedures of hypothesis testing and estimation. Prereq: 5110. W; Sp

5211 Elementary Statistics (3) Introductory statistics for graduate students. Probability, sampling dis-
The College of Communications offers two graduate degrees with a major in Communications, the Master of Science (M.S.) degree and the Doctor of Philosophy (Ph.D.) degree. In addition, Communications is available as a minor for students majoring in other departments. Required course work will be selected after discussion with the major advisor and an advisor from the College of Communications.

The M.S. program (professional track) is accredited by the American Council on Education for Journalism and Mass Communication. The College is a member of the American Association of Schools and Departments of Journalism and the Broadcast Education Association. The doctoral program in Communications is listed in the Academic Common Market of the Southern Regional Education Board. Students residing in Alabama, Georgia, Kentucky, South Carolina, Virginia, and West Virginia can normally qualify for in-state fee status by applying to the Academic Common Market coordinators in their state capitals.

Masters of Science (M.S.)

The Master of Science degree with a major in Communications is offered for students who primarily desire (1) advanced preparation in effective communication for mass media and other fields of applied communications, or (2) a deeper understanding of the communication process and the social role of the mass media. The prospective student who is interested only in acquiring basic skills in journalism, advertising, or broadcasting is advised to consider a second baccalaureate rather than an advanced degree.

Applicants must meet admission requirements of The Graduate School. In addition they must complete the Graduate Record Examination, the California Psychological Inventory, and application forms as required by the College of Communications. All application materials will be screened by an admissions committee authorized by the Graduate Studies Committee of the College of Communications.

New students may be admitted to the program at any time; however, core course sequences begin only in the fall quarter. Unless necessary materials are received at least six weeks before registration, applications may not be processed in time for admission to full potential candidate status in the first quarter. In these cases, the student may still qualify for non-degree or provisional status.

Students who have had no courses in their major areas of concentration may expect to spend six or more full-time quarters in the program. The student may choose either of two tracks, both leading to the M.S. in Communications and both requiring a thesis:

- The academic track is designed for the student who wishes to emphasize advanced study of the theory and effects of communications. A minimum of 45 hours of approved graduate work is required:
  - 12 hours of core courses: Communications 5100, 5120, 5140, and 6140, the first three of which must be taken during the first two quarters of the student's program, except with written approval of the Assistant Dean for Graduate Studies for the College.
  - 9 hours of thesis work (Communications 5130 to their core);
  - 9 hours of thesis work (Communications 5100, 5120 and 5140, which must be taken during the first two quarters of the student's program, except with written approval of the Assistant Dean for Graduate Studies for the College;
  - 15 hours (18 in journalism) in a major area within the College, including at least 6 hours at the 5000 level;
  - 9 hours of thesis work (Communications 5000), including at least 3 hours of thesis seminar;

- at least 12 hours (9 in journalism) in a minor area approved by the major advisor, of which at least 6 hours must be at the 5000 level.

In addition, students with Bachelor's degrees in other cognate areas will be required to complete prerequisites as designated by their advisors. Advising for the professional track will be supervised by the chairperson of the appropriate department of the College.

Each student in the professional track M.S. program is encouraged to engage in a one-quarter professional internship in the field of his/her choice. After the formal program of courses and research in either track is completed, the student must pass an oral examination conducted by his/her graduate committee.

The program is interdisciplinary, consisting of a required core curriculum and recommended emphasis 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 quarter.

The Master's degree is not required for entry into or completion of the doctoral program. Program planning, however, will...
permit the Master's degree to be earned if desired. Students lacking academic or professional experience in communications will be required to take prerequisite courses. In general, however, the program may be completed within three academic years of full-time study beyond the Bachelor's degree. Those holding Master's degrees should anticipate two or more years of full-time study for completion of the Ph.D. degree.

The following minimal requirements for admission to full potential candidate status: (a) a 3.0 (4.0 system) grade point average in undergraduate studies, or 3.5 for graduate work if applicant holds a Master's degree; (b) above the fiftieth percentile in verbal and quantitative aptitude on the Graduate Record Examination; (c) completion of the California Psychological Inventory; (d) endorsement by at least three former teachers or professional colleagues; (e) 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.

The course requirements for the Ph.D. area:
1. Core 57 hrs
   Communications 5120, 5121, 5140, 5200, 5410, 5420, 5470, 6100, 6140, 6141, 6200; one of the following: 5300, 5310, 5320, 6330, plus 6 additional hours of advanced research courses; Statistics 5050 and 5060, 6 graduate hours of education; 3 graduate hours of organizational behavior; Computer Science 4130 or equivalent.
2. Primary Concentration 21 hrs
   (Advisory courses in advertising, broadcasting, public relations, or speech communication)
3. Secondary Concentration 18 hrs
   (Outside the College of Communications or a second concentration in Communications)
4. Dissertation 48 hrs

A student in the College of Communications whose graduate grade point average, not including any prerequisite courses, is 3.0 or higher at any time after the end of 12 hours of graduate credit will be placed on probation. A student on probation will be dropped from the program unless his or her cumulative graduate grade point average is 3.0 or higher at the end of the probationary period. The probationary period is defined as the next 12 quarter hours of graduate coursework attempted which is specified in the student's degree program. Exceptions to this policy may be made only with the approval of the Assistant Dean for Graduate Studies of the College of Communications upon the recommendation of the student's faculty committee.

Communications Research Center

The Communications Research Center is a vital adjunct to the communications graduate program. Objectives of the Center are: (a) to conduct original research in mass and public communication; (b) to disseminate research-generated information; and (c) to provide research services to faculty and students, professional communicators, and others interested in improving the quality of human communications.

Departments of Instruction

Planned course offerings in the College of Communications for a full calendar year are published in the College newsletter the preceding November. This information is available from the Dean's Office, 302 Communications Building, 974-3031.

Communications

MAJOR DEGREES

Communications

Professors:
J. A. Crook, Ph.D., Iowa State; G. A. Everett, Ph.D., Iowa; A. D. Fichter, Ph.D., Illinois; J. B. Haskins, Ph.D., Minnesota; D. G. Hileman, Ph.D., Illinois; D. W. Holt, Ph.D., Northwestern; H. H. Howard, Ph.D.; D. W. B. Kejler, Ph.D., Southern Illinois; D. D. Nimmo, Ph.D., Vanderbilt.

Associate Professors:
P. G. Ashdown, Ph.D.; Bowling Green; M. M. Miller, Ph.D., Michigan State; M. W. Singletary, Ph.D., Southern Illinois.

5000 Thesis (1-15) P/NP only. E

5100 Introduction to Graduate Studies (3) Scope and methods of advanced study in communications. Information sources, literature review methods, scholarly style, thesis and degree requirements and procedure, overview of traditional and behavioral research methods. Prereq: 5100, 5120, 5140.

5120 Communications Research Design (3) Non-experimental, quasi-experimental, laboratory and field experimental designs. Universal research process from idea/problem definition to reporting results. Correlation vs. causation. Su, F

5130 Communications Research Methods (3) Fundamentals and specific applications of most common data-gathering and measurement techniques in communications research: focus groups, mail, personal and telephone surveys; content analysis; mechanical and physiological measurement; observation; attitude measurement. Prereq: 5100. W

5120 Advanced Principles of Mass Communications (3) Proseminar covering all phases of mass communications including history, development and current status of communication industry, principles of broadcasting, and principles of advertising. F

5140 Mass Communication Theory I (3) Critical appraisal of selected hypotheses and theoretical concepts in research literature of mass communications. Conceptualization of communication processes. Prereq: 5100 or 6100. Recommended prereq: 5120. F, W

5150 Seminar in Communications Issues (3) Contemporary topics in communications. Prereq: 5100 and 5140, or consent of instructor. May be repeated. Maximum 6 hrs.

5200 Seminar in Communication Education (3) Principles and historical perspectives of education for journalism, broadcasting, and advertising. Su

5410 Seminar in Communications Law (3) Legal limitations, privileges, and major issues affecting mass media: law of libel and invasion of privacy, development of obscenity law, free press and fair trial, contempt of court, federal regulation of broadcasting, advertising and public relations industries, copyright and access to information. F

5420 Seminar in Communications History (3) Major trends in media development; major concepts and issues. Prereq: Survey course in communications history or consent of instructor. W

5470 Seminar in Media Economics and Management (3) Electronic media ownership and finance, role of new technologies and marketing techniques; corporate personnel policy, budgeting and expansion. Prereq: 5130 or equivalent. Sp

5970 Independent Study (3) Reading, research, or projects on special topics in communication. On individual basis, under faculty direction, with consent. May be repeated.

6000 Doctoral Research and Dissertation (3-15) P/NP only. E

6100 Introduction to Doctoral Studies (1) Doctoral degree and dissertation requirements. Committee formation and program planning. Overview of research methods and informational sources. S/N/C only.

6140 Mass Communication Theory II (3) Application of theory to contemporary mass communication problems. Topical approach; literature reviews and analytical papers. Prereq: 5120, 5140, 6100. W

6141 Mass Communication Theory III (3) Continuation of 6140; detailed analysis of selected topics in theory and research. Tutorials, readings, reviews, reports, and papers in fields of interest. Prereq: 6140. Sp

6300 Seminar in Communication Topics (3) Identification, presentation and analysis of special issues and problems in communication. Organization and strategy in writing research proposals. Prereq: 5100, 5120, 5140. Recommended prereq: 5120 or consent of instructor. W

6300 Survey Research Methods in Communications (3) Survey methods applied to opinion and communications media research problems. Planning, sampling, questionnaire construction, data gathering (personal, mail, and telephone), data processing and interpretation. Attitude measurement and message pretesting applications. Prereq: 5120 or consent of instructor. W

6310 Experimental Research Methods in Communications (3) Experimental methods applied to communications research problems. Causal inferences from various research designs. Control, single- and multiple-factor designs, laboratory and field experiment situations. Prereq: 5120 or consent of instructor. W

6310 Research Methods in Communications (3) Experimental methods applied to communications research problems. Causal inferences from various research designs. Control, single- and multiple-factor designs, laboratory and field experiment situations. Prereq: 5120 or consent of instructor. W

6350 Content Analysis (3) Content analysis as mass media research technique, conceptual foundations. Research design, categorization, sampling procedures, data gathering, and analysis.

Advertising

Professors:
A. D. Fichter, Ph.D., Illinois; J. B. Haskins, Ph.D., Minnesota; D. G. Hileman, Ph.D., Illinois.

Associate Professors:

Assistant Professor:
M. L. Kern-Foxworth, Ph.D., Wisconsin.

3630 Advertising Copy and Layout (4) Ideas and their translation into persuasive words and pictures. Principles and techniques of copy and layout. Lec-
ture and labs. Prereq: 3000 with grade of "C" or better or consent of instructor. F, W, Sp
4000 Advanced Advertising Copy and Layout (4) Creative strategy and execution of advertisements for mass media. Problems in idea creation for advertisers. Lectures and labs. Prereq: 3630 with grade of "C" or better or consent of instructor. F, W, Sp
4360 Advertising Media (3) Media, markets, and audiences. Evaluation of media in relationship to communication needs of advertisers. Prereq: 3000 with grade of "C" or better or consent of instructor. E
4460 Cases and Problems (3) The case approach to the study of advertising problems. Analysis of campaigns and trends. Prereq: 3630, 3650 and 4360 with grade of "C" or better or consent of instructor. F, W, Sp
4470 Advertising Campaigns (4) Application of theory in planning and execution of campaigns. Market and consumer research; development and allocation of budgets. Choice of appeals and approaches; media selection; preparation of advertisements. Prereq: 3650, 4000 and 4360 with grade of "C" or better or consent of instructor. F, W, Sp
4970 Independent Study (3) May be repeated. Maximum 6 hrs.
5310 Current Issues in Advertising (3) Current socioeconomic, legal, ethical, and cultural issues in advertising and mass communication. Determination of advertising's role in and responsibility toward society. Emphasis on both marketing and behavioral science approach to advertising decisions. Consideration of advertising's impact on media, management, and research. Extensive individual reading; preparation and delivery of papers. Prereq: Consent of instructor. W
5340 Advertising Management (3) Agency-client relations, media strategy, creative strategy, research, and relationship between advertising and marketing function. Prereq: 4360 and 3630 or consent of instructor. Sp
5500 Advanced Advertising Research (3) Nature, scope, and application of research including measurement of advertising, media audiences, and evaluation of messages. Prereq: 4460 or consent of instructor.
5970 Independent Study (3) E

Broadcasting
Professors:
D. W. Hof (Head), Ph.D. Northwestern; H. H. Howard, Ph.D. Ohio.
Associate Professor:
Assistant Professors:
B. A. Moore, Ph.D. Ohio; R. A. Shirley, M.A. Tennessee.

Communications Specialist:
J. H. Carr, M.S. Tennessee.

3360 Television and Radio Advertising (3) Principles of successful radio-television advertising; emphasis on media research, rate structure, programming, creativity, television commercials. W
3350 Radio-Television Writing (3) Theory and technique of writing broadcasting scripts except news and dramas. Special events, interviews, musical programs, radio documentaries, and promotion material. F, W
4010 Speech for Broadcasting (3) Fundamental broadcast conditions affecting the announcer; pronunciation and oral interpretation of general American speech; Spanish, Italian, German, and French pronunciation. Prereq: Speech 2311. F, W
4020 Radio Production (3) Study of radio productions, past and present. Familiarization with production tools and techniques. Group and individual production activities. Prereq: 2750 or consent of instructor. Cannot be taken for graduate credit by communications majors. E, F
4030 Television Production (3) Overview of elements of television production: cameras, sound, lighting, videotape recording, optics, and studio control centers. Presented with the layperson and professional broadcast student in mind. Prereq: 4020 or consent of instructor. Cannot be taken for graduate credit by communications majors.
4040 Advanced Television Production (3) A seminari course in program origination, producing, directing and presenting with orientation to the professional broadcast student. Prereq: 4030 or consent of instructor. Sp
4610 Broadcast News Operation (3) Theory and practice in covering local news and public affairs events for radio and television. Gathering and production of news broadcasts, using tools of broadcast newscaster. Prereq: 3610 and 3670 or consent of instructor. 2hrs and 1 lab. Sp
4670 Radio-Television Management (3) Business policies and practices of networks and stations. Development and application of research into broadcasting. Prereq: 2750 or consent of instructor. F, Sp, Su
4680 Broadcast Sales Management (3) Problems and practices of sales, case studies in sales development, promotion, and other areas of sales management. Prereq: 2750 or consent of instructor. Sp
4970 Independent Study (3) May be repeated. Maximum 6 hrs.
5410 Educational Broadcasting (3) Summary, analysis, application, and evaluation of television and radio broadcasting for educational purposes. Sp
5510 Creative Projects (3) For students having specialization in radio-television or radio-television. Prereq: 4360 or consent of instructor. E
5610 Public Affairs Broadcasting (3) News and public affairs function in broadcasting and networks, including management, economics, personnel utilization, sources of program materials, legal and ethical aspects. Public affairs production development, particularly press conferences, interviews, news specials. Prereq: 3610 or consent of instructor. W
5620 Broadcast Law and Regulations (3) Sociopolitical control of broadcasting; effect of laws, regulations, and public pressures upon station policies. Emphasis on unique situation of broadcasting among media in terms of regulation. Prereq: Journalism 4410 or 5210 or consent of instructor. F
5630 Broadcast Documentary Writing (3) Role of documentary programs in broadcasting and their importance in the recording of history and in publicizing local affairs. Prereq: 4360 or consent of instructor. F
5550 Radio-Television Program Development (3) Planning and production of programs for radio and television. Prereq: 4360 or consent of instructor. E
5970 Independent Study (3) E

School of Journalism
Professors:
J. A. Crook (Director), Ph.D. Iowa State; G. A. Everett, Ph.D. Iowa; J. B. Haskins, Ph.D. Minnesota; R. H. Johnson, Ph.D. Southern Illinois; D. D. Nimmo, Ph.D. Vanderbilt.
Associate Professors:
Assistant Professors:
M. E. Korns, Ph.D. Wisconsin; D. L. Smith, M.A. San Francisco State

3120 Writing Feature Articles (3) Selection of topics and practice in writing feature articles for newspapers, magazines, and commercial publications. Prereq: 2220 or consent of instructor. E
3410 Communications Law (3) Statutory law and judicial precedents affecting mass communications. Prereq: 2220 or consent of instructor. F
3720 Advanced Public Relations (3) Preparation of public relations materials to gain support from various audiences; planning public relations programs. Prereq: 3710.
3810 Specialized Publications (3) Editorial and design considerations for technical and trade magazines. Prereq: 2220 and 3310 or consent of instructor. W, Sp
3990 Journalism Research Methods (3) Use of social science research methods in journalism with emphasis on research techniques. Prereq: Consent of instructor. W
4130 Editorial Writing (3) Analysis of editorial policies, practices, and procedures. Writing of editorials and columns. Prereq: 2220.
4150 Issues in Journalism (3) Topics vary. Maximum 6 hrs.
4310 Reporting Public Affairs (3) Reporting news of events, politics, and government. Prereq: 2220 and senior standing. W
4410 Mass Media and Society (3) Studies of various media in society. Critique of media performance. Media codes and control on the media. F
4420 Newspaper Management (3) Daily and weekly business operations. Development in newspaper management. Sp
4560 Investigative Reporting (3) Investigative and in-depth reporting of complete and specialized subjects to place news in perspective or to clarify situations. Prereq: Consent of instructor. F
4710 Public Relations Cases (3) Case studies and application of public relations principles to problems in business and industry, government, institutions, trades and professions, solving problems in public relations situations. Prereq: 3720.
4810 Journalism in the High School (3) Functions and methods of high school publications. Staff, organization, writing, testing techniques, editorial problems, and business management.
4910 News and Feature Photography (3) Advanced principles and methods in black-and-white photography. Emphasis on news and feature photographs, and picture stories. Prereq: 3910 or consent of instructor. F
4950 International Communications (3) Communication of news and opinion among nations and under varying types of political and economic systems; world news organizations; the press as a factor in international affairs; barriers to the flow of information; comparison of world press systems.
4970 Independent Study (3) May be repeated. Maximum 6 hrs.
5120 Government and the Press (3) Historic and current problems in the relations of executive, judicial, legislative, and regulatory segments of government and press. Prereq: 3110 or consent of instructor. W
5260 Public Opinion and Mass Media (3) Nature of public opinion with emphasis on role of press in its formation and how the press in turn is influenced by public opinion. Prereq: 4410 or consent of instructor. W
5510-30 Writing and Editing Projects (3, 3) Specialized writing or editing interests, such as agricultural, politics, labor, finance, science, for technical and general publications. Prereq: 2220 or 2220.
5560 Magazine Article Writing (3) Techniques of writing in-depth articles for mass circulation magazines. Organizing and presenting material. Problems in specialized areas, such as business, science, agriculture, the humanities. Prereq: 3120 or consent of instructor.

5710 Studies In Public Relations Communications (3) Problems of communication between institutions and organizations and their publics. Case histories and evaluations of programs. Prereq: 3710 or consent of instructor.

5810 Magazine Editing and Production (3) Analysis of editorial and production problems of general, regional, and specialized publications. Reader interest evaluation. Individual editorial projects. Prereq: Consent of Instructor.

5950 Communications and International Development (3) Seminar emphasizing mass media in national and international development. Communications and change in developing countries. Problems in international and cross-cultural communications. Prereq: 4950 or consent of instructor.

5970 Independent Study (3)