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. Students are expected to meet all requirements in effect at the time of graduation.

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

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 Director for Affirmative Action, 405D Andy Holt Tower, Knoxville, TN 37996-0144, phone: 974-2498. Charges of violation of the above policy should also be directed to the Office of the Director for Affirmative Action.
University Calendar for 1985-86

Winter Quarter, 1985
- January 3-4 (Thursday-Friday)
- January 5 (Saturday)
- February 4-8 (Monday-Friday)
- February 8 (Friday)
- March 16 (Saturday)
- March 19 (Tuesday)

Spring Quarter, 1985
- March 25-29 (Monday-Tuesday)
- March 27 (Wednesday)
- April 5-6 (Friday-Saturday)
- April 30 (Tuesday)
- April 29-May 3 (Monday-Friday)
- May 20-24 (Monday-Friday)
- June 7 (Friday)
- June 11 (Tuesday)

Summer Quarter, 1985
- June 18-19 (Tuesday-Wednesday)
- June 20 (Thursday)
- July 1-5 (Monday-Friday)
- July 4 (Thursday)
- July 8 (Monday)
- July 22-24 (Monday-Wednesday)
- July 24 (Wednesday)
- July 25 (Thursday)
- July 22-26 (Monday-Friday)
- August 12 (Monday)
- August 27 (Tuesday)
- August 29 (Thursday)

Fall Quarter, 1985
- September 19-20 (Wednesday-Thursday)
- October 26 (Saturday)
- November 28-30 (Thursday-Saturday)
- December 6 (Friday)
- December 10 (Tuesday)

Winter Quarter, 1986
- January 9-11 (Monday-Tuesday)
- January 8 (Wednesday)
- February 5-7 (Monday-Friday)
- February 11 (Tuesday)
- March 19 (Wednesday)
- March 21 (Friday)

NOTE: Deadlines for degree requirements described on pp. 21-22.
Academic Units

Institute of Agriculture
23 Agricultural Experiment Station
Agricultural Extension Service

College of Agriculture
24 Agricultural Economics and Rural Sociology
25 Agricultural Engineering
26 Agricultural Extension Education
Agriculture
Animal Science
28 Entomology and Plant Pathology
Food Technology and Science
29 Forestry, Wildlife and Fisheries
31 Ornamental Horticulture and Landscape Design
Plant and Soil Science

College of Veterinary Medicine
34 Animal Science-Veterinary Medicine
Environmental Practice
35 Microbiology-Veterinary Medicine
Pathobiology
36 Veterinary Practice
Rural Practice
Urban Practice
38 Interdepartmental

College of Business Administration
40 Accounting and Business Law
42 Business Administration
Economics
44 Finance
Management
45 Management Science
46 Marketing and Transportation
47 Statistics

College of Communications
49 Communications
50 Advertising
Broadcasting
School of Journalism

College of Education
52 Art and Music Education
53 Curriculum and Instruction
54 Education
Educational and Counseling Psychology
57 Educational Leadership
59 Special Education and Rehabilitation
60 New and Adult Education

School of Health, Physical Education, and Recreation
65 Health and Safety
66 Physical Education
67 Public Health
68 Recreation

College of Engineering
69 Chemical, Metallurgical and Polymer Engineering
73 Civil Engineering
76 Electrical Engineering
80 Engineering Administration
Engineering Science and Mechanics
82 Industrial Engineering
83 Mechanical and Aerospace Engineering
86 Nuclear Engineering

College of Home Economics
89 Child and Family Studies
90 Home Economics
Home Economics Education
Nutrition and Food Sciences
92 Textiles, Merchandising, and Design

Intercollegiate Programs
94 Aviation Systems
Comparative and Experimental Economics
95 Ecology
96 Industrial and Organizational Psychology
97 Life Sciences
Management Science

College of Law
98 Law

College of Liberal Arts
103 Anthropology
105 Art
107 Audiology and Speech Pathology
109 Biochemistry
111 Biology
Botany
113 Chemistry
115 Classics
Computer Science
117 Cultural Studies
118 English
120 Geography
121 Geological Sciences
123 Germanic and Slav Languages
124 History
127 Mathematics
130 Microbiology
131 Music
134 Philosophy
135 Physics and Astronomy
137 Political Science
139 Psychology
141 Religious Studies
142 Romance Languages
144 Sociology
146 Language Programs
Speech and Theatre
147 Speech and Theatre

College of Medicine-Knoxville
149 Medical Biotechnology

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150 Nursing

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153 Architecture

Graduate School of Biomedical Sciences
154 Biomedical Sciences

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156 Library Science

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158 Planning

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160 Social Work

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

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From Davidson County
From Hamilton County
From Knox County
From Shelby County
From Weakley County

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Second June 1, 1986
Third June 1, 1988
Fourth June 1, 1997
Fifth June 1, 1991
Sixth June 1, 1990
Seventh June 1, 1993
Eighth June 1, 1988
Ninth June 1, 1996
TERM EXPIRES
June 1, 1990

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Student Member
Meleida Stokes

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Col. of Bus. Admin.  | Dr. David J. Barnaby  | Dec. 31, 1984  | Dr. Ronald E. Shrieves
 | Dr. Robert B. Woodruff  | Dec. 31, 1985  | Dr. Robert B. Bohn
Col. of Communications  | Dr. Mark Miller  | Dec. 31, 1985  | Dr. Michael Singletary
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 | Dr. Paul A. Wishart  | Dec. 31, 1984  | Dr. David Craig
 | Dr. William A. Poppet  | Dec. 31, 1985  | Dr. James A. Miller
 | Dr. Laurence J. Coleman  | Dec. 31, 1985  | Dr. Patricia Bietel
 | Dr. John R. Ray  | Dec. 31, 1986  | Dr. Donald J. Dessart
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 | Dr. Jeffrey W. Hodgson  | Dec. 31, 1986  | Dr. Thomas G. Carley
Col. of Home Economics  | Dr. Sandra Twardosz  | Dec. 31, 1986  | Dr. John T. Smith
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 | Dr. Patrick J. Carney  | Dec. 31, 1984  | Dr. John Muldowney
 | Dr. Arthur Eichmacht  | Dec. 31, 1985  | Dr. Donald W. Goodpasture
 | Dr. Allan G. Yeomans  | Dec. 31, 1985  | Dr. Thomas G. Carley
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 | Ms. Debbie Steuber  | Apr. 30, 1984  | Dr. Patricia G. Droppleton
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 | Dr. Gordon Fryer  | Dec. 31, 1985  | Dr. Maurice A. Wright
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Dr. Malcolm McInnis  | Dec. 31, 1984
Dr. Kenneth B. Kenney  | Dec. 31, 1985
Dr. Richard J. Courney  | Dec. 31, 1985
Dr. Sam Bills  | Dec. 31, 1985

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UT Space Institute  | Dr. Robert L. Young  | Dec. 31, 1985  | Dr. Michael H. Sims
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<td>Consumer Studies &amp; Hospitality, Public Policy*</td>
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*Non-degree and provisional students must obtain permission from the department/program head to register for courses in these fields.

All documents required for admission are submitted to the Office of Graduate Admissions & Records unless noted otherwise.

a International applicants only.
b American applicants only.
c G.S. Rating Form submitted to Department.
d Forms obtained from & returned to Department.
The Graduate School

C. W. Minkel, Vice Provost and Dean of The Graduate School
Mary P. Reinhart, Associate Dean of The Graduate School
Thomas H. Knob, Assistant Dean of The Graduate School
Diana Lopez, Director, Graduate Admissions and Records
Rose Ann trantham, 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 leading to the Master's and doctoral degree, and offering a wide range of graduate opportunities. Serving the needs of students, the University has provided 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, Assistant Dean, and Associate 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.

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 nor 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 before 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

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 Graduate Degree Program:

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 study, letters of recommendation from professors familiar with the applicant's capabilities, and other 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, before accumulating 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, $15 fee, and one (1) official transcript from each insti-
tution previously attended are required for consideration as a non-degree student. The
minimum requirements are a Bachelor's degree with a 3.0 grade point average on a 4.0 scale or (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 9-10 for information on restricted programs.) Every graduate student must meet with an academic advisor at least once a quarter to discuss his/her program. If no advisor has been assigned, the department head or designee is the advisor. For a non-degree student who has no declared major, the Assistant Dean of The Graduate School or designee is the advisor if the student's major is The Graduate School. Student must have an advisor from the academic unit.

Admission to non-degree status does not assurance admission to a degree program. The student who wishes to enter a degree pro-
gram will be directed to the appropriate department. Students must maintain a 3.0 grade point average to continue enrollment in non-degree status.

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

Provisional Admission: Applicants may be ad-
noted, but some departments do not permit provisional students to register for graduate courses. (See pages 9-10 for information on restricted programs.) Every graduate student must meet with an academic advisor at least once a quarter to discuss his/her program. If no advisor has been assigned, the department head or designee is the advisor. For a provisional student who has no declared major, the Assistant Dean of The Graduate School or designee is the advisor if the program is unregistered. For restricted programs, the student must have an advisor from the academic unit.

Any student admitted to the provisional status must receive permission from The Graduate School to register for a second or succeeding quarter if admission to the non-
degree status cannot be obtained. To be admitted to the non-degree or degree status has not been obtained. At least a 3.0 grade average in all course work (grade point average of 4.0) is taken in the provisional status, to include at least six hours of graduate work. The Office of Graduate Admissions and Records will process the change to non-degree status if all require-
ments are met. To apply for a specific degree program, the student must submit the Request for Change of Graduate Pro-
gram form to the Office of Graduate Admissions and Records.

Provisional admission does not assure admission to a non-degree or degree pro-
gram. A student who wishes to enter a degree program will be directed to the appropriate department.

The student who fails to complete prov-
sional admission during the period of enrollment will NOT be permitted to register again. All records showing the course work taken, until all admission requirements are met. An international student on a non-
immigrant visa may not enroll in the provi-

Admission of International Students: The Graduate School accepts only students who have superior records. An international stu-
dent must have an equivalent 4-year Bachelor's degree with at least a B average on undergraduate course work and a B+ on all previous graduate work. On various grad-
ings scales, this would indicate:

a. 3.0 and 3.5 on 4.0 scale;

b. 14 and 15 on 20 point scale;

c. 80.0 from Chinese institutions;

d. 1st Class or Division from Indian institutions;

a. Upper 2nd Class Honors on various

degree.

Other grading systems will be evaluated upon request of the student. An international student may apply for admission any quar-
ter and normally completes the summaries in the quarter. Deadlines for submission of applica-
tions are:

- Summer: Dec. 1
- Fall: March 15
- Winter: August 15
- Spring: Sept. 15

The Office of Graduate Admissions and Records must be notified of any change in admission date after admission has been granted. Individual departments and colleges may have further restrictions on admission dates. For this information, students should consult the appropriate department chairpersons they wish to enter.

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

1. A completed application form with a $15 non-refundable processing fee.
2. Official or attested university records, with certified transcripts if the records are not in English (Notarized copies are not acceptable).
3. Certification of English proficiency. Every student whose native language is not English must either submit a score of 625 or above on the Test of English as a Foreign Language (TOEFL), taken within the past two years, or have received a degree from an accredited U.S. institution.
4. Documented evidence of financial resources sufficient to support the student with at least U.S. $10,500 per calendar year during the period the student is enrolled. Financial resources may be granted on an individual basis. Further infor-
mation is provided in the Handbook.

5. Results of the Graduate Record Exam-
nation (GRE) or Graduate Management Admis-
sion Test (GMAT), if required.
6. Letters of recommendation or rating forms, if required.

Admission must be granted and financial documentation and degree confirmation must be received prior to issuance of an I-20 or I-17F document to obtain a visa. The Graduate School will not issue these forms at the following dates:

Summer: April 1
Fall: July 15
Winter: Nov. 1
Spring: Feb. 1

All students who have not completed English proficiency exam will be considered: For admission to a non-degree or degree program at another institution and who wishes to consider courses for transfer to that institution may be admitted after submitting a completed Graduate Application for Admission, the $15 application fee, and a Transient Student Certification 10 days prior to registration. Only one quarter, or a maxi-
mum of 12 hours, of course work can be taken in transferrable status. Necessary forms may be obtained from the Office of Graduate Admissions and Records.

Eligibility of Seniors: Subject to approval by The Graduate School, a senior at UTK who needs fewer than 40 quarter hours to complete the requirements for a Bachelor's degree and has at least a B average (3.0) may enter as a provisional student. The student must be able to provide the combined total of undergraduate and graduate course work does not exceed 15 credit hours per quarter. Approval must be obtained six month prior to registration. Only one quarter, or a maxi-
mum of 12 hours, of course work can be taken in transferrable status. Necessary forms may be obtained from the Office of Graduate Admissions and Records.

Admissions and Records during registration. A maximum of 15 credit hours per quarter may be taken as a graduate student.

Institutions; 

The University will not enroll any student who has been enrolled in a graduate degree pro-
gram at another institution and who wishes to take courses for transfer to that institution may be admitted after submitting a completed Graduate Application for Admission, the $15 application fee, and a Transient Student Certification 10 days prior to registration. Only one quarter, or a maxi-
mum of 12 hours, of course work can be taken in transferrable status. Necessary forms may be obtained from the Office of Graduate Admissions and Records.

Eligibility of Seniors: Subject to approval by The Graduate School, a senior at UTK who needs fewer than 40 quarter hours to complete the requirements for a Bachelor's degree and has at least a B average (3.0) may enter as a provisional student. The student must be able to provide the combined total of undergraduate and graduate course work does not exceed 15 credit hours per quarter. Approval must be obtained six month prior to registration. Only one quarter, or a maxi-
mum of 12 hours, of course work can be taken in transferrable status. Necessary forms may be obtained from the Office of Graduate Admissions and Records.

Eligibility of Seniors: Subject to approval by The Graduate School, a senior at UTK who needs fewer than 40 quarter hours to complete the requirements for a Bachelor's degree and has at least a B average (3.0) may enter as a provisional student. The student must be able to provide the combined total of undergraduate and graduate course work does not exceed 15 credit hours per quarter. Approval must be obtained six month prior to registration. Only one quarter, or a maxi-
mum of 12 hours, of course work can be taken in transferrable status. Necessary forms may be obtained from the Office of Graduate Admissions and Records.

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Eligibility of Seniors: Subject to approval by The Graduate School, a senior at UTK who needs fewer than 40 quarter hours to complete the requirements for a Bachelor's degree and has at least a B average (3.0) may enter as a provisional student. The student must be able to provide the combined total of undergraduate and graduate course work does not exceed 15 credit hours per quarter. Approval must be obtained six month prior to registration. Only one quarter, or a maxi-
mum of 12 hours, of course work can be taken in transferrable status. Necessary forms may be obtained from the Office of Graduate Admissions and Records.

Eligibility of Seniors: Subject to approval by The Graduate School, a senior at UTK who needs fewer than 40 quarter hours to complete the requirements for a Bachelor's degree and has at least a B average (3.0) may enter as a provisional student. The student must be able to provide the combined total of undergraduate and graduate course work does not exceed 15 credit hours per quarter. Approval must be obtained six month prior to registration. Only one quarter, or a maxi-
mum of 12 hours, of course work can be taken in transferrable status. Necessary forms may be obtained from the Office of Graduate Admissions and Records.

Eligibility of Seniors: Subject to approval by The Graduate School, a senior at UTK who needs fewer than 40 quarter hours to complete the requirements for a Bachelor's degree and has at least a B average (3.0) may enter as a provisional student. The student must be able to provide the combined total of undergraduate and graduate course work does not exceed 15 credit hours per quarter. Approval must be obtained six month prior to registration. Only one quarter, or a maxi-
mum of 12 hours, of course work can be taken in transferrable status. Necessary forms may be obtained from the Office of Graduate Admissions and Records.
Admission Procedures

Anyone with a Bachelor’s degree from a regionally accredited institution wishing to take courses for graduate credit, whether or not the person desires to become a candidate for a degree, must make formal application for admission to The Graduate School or apply for transient status. No action is taken until a file is 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 $15 application fee.
3. One official transcript 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 taken the General Information section of the Graduate Record Examination or the Graduate Management Admission Test.

Forms obtained from the college or department should be returned to the Office of Graduate Admissions and Records.

A prerequisite period is scheduled each quarter for a subsequent quarter (see University Calendar). Any graduate student who has applied for admission can preregister. Information can be obtained from the Office of Graduate Admissions and Records. A student who participates in preregistration should obtain the computerized class schedule and pay fees on the first day of registration.

Failure to pay tuition and fees before the deadline listed each quarter in the Timetable of Classes will result in the assessment of a late registration fee. Retroactive registration is not permitted.

Family Educational Rights and Privacy Act

The Family Educational Rights and Privacy Act provides for confidentiality of student records. However, it also provides for basic identification of persons at UTK without the consent of the individual. Information to third parties includes directory information containing information such as name, address, telephone number, date and place of birth, major, dates of attendance, degrees and awards, most recent previous education, and institutional attendance.

Others have access to your information in the following cases:

1. Student and graduate assistants, as well as fellowship students who may waive fees (tuition and/or maintenance), must pay the appropriate University Programs and Services Fee.
2. Graduate and teaching assistants, as well as fellowship students who may waive fees (tuition and/or maintenance), must pay the appropriate University Programs and Services Fee.
3. Undergraduate students taking a course load of more than 8 hours may elect to pay the $15 student health fee plus the appropriate part-time programs and services fee. The student health fee is included in the full $56 programs and services fee.

All students are required to have a valid id card to complete the registration procedure. This includes students whose fees are billed, prepaid, or

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 .....................................$15

Each graduate application for admission must be accompanied by a fee of $15 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 $15 application fee and application. This fee is not refundable.

MAINTENANCE FEE (all students):
PER QUARTER $658
PER SEMESTER $1316
PER YEAR $5264

TUTION (additional for out-of-state students):
PER QUARTER $346

PER SEMESTER $692

PER YEAR $2768

PER QUARTER $658

PER SEMESTER $1316

PER YEAR $5264

In-State $50 per quarter hour or fraction thereof; minimum charge $150.

Out-of-State $115 per quarter hour or fraction thereof; minimum charge $345.

UNIVERSITY PROGRAMS AND SERVICES FEE:
PER QUARTER $56

The fee for the summer quarter is $43. Payment is due no later than the beginning of the quarter. A late fee of $3 per quarter hour or fraction thereof will be charged if payment is not received by the third week of the quarter.

Students may request that such information not be released.

Student Identification Number

UTK requires assignment of an individual 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 processing and accurate retrieval of student 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 written consent of the student.

FINANCIAL AID

Note: Under the General Education Law, the Board of Trustees has the power to assess a 2% tuition and fee increase for the next fiscal year. If approved, the board directs the president to increase the tuition and fees for the next fiscal year.

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to withdraw from school for the quarter. 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 $80. 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 $30

One-hour lesson per week $60

Payable at registration by students receiving individual instruction in music.

**GRADUATION FEE:**
- Master's degree candidates $30
- Doctoral degree candidates $70

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**...$10

This fee is applicable when the payment of any part of a student's account is deferred, including accounts which must be paid 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 COURSES NOT TAKEN FOR CREDIT:**

- Fees for courses audited are the same as for classes 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. It is the student's responsibility to take the initiative to withdraw from classes promptly.

**SUMMER QUARTER FEES AND EXPENSES:**

The drop/add procedure must not be used to withdraw or drop a student from school or class. Once a schedule has been received by the student, withdrawal from school for the quarter must be by official notification to the Withdrawal Office. It is the student's responsibility to take the initiative to withdraw from classes promptly.

**WAIVER OR FEES:**

Grants, scholarships, assistantships, and others whose fees are billed, prepaid, or waived must complete their registration with the Student Financial Aid Office. Residents of one of the cooperating states must complete their registration with the Student Financial Aid Office. Residents of one of the cooperating states must complete their registration with the Student Financial Aid Office.

A student who is classified out-of-state for tuition purposes is not eligible for in-state tuition rates in the state or at Fort Campbell, Kentucky, and is eligible to attend UT on a part-time basis (maximum 6 hours of course work per quarter), as eligible for a waiver of out-of-state tuition. The student must apply for a 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 reclassification 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 reclassification that quarter.

**Academic Common Market**

The Academic Common Market is an interstate agreement among Southern states for sharing unique programs. Participating states have entered agreements with each other and other states for the benefit of students who are residents of full-time in-state or at Fort Campbell, Kentucky. Students attending UT on a part-time basis are eligible for out-of-state tuition rates. Applications for reimbursement of in-state rates in the state or at Fort Campbell, Kentucky, and is eligible to attend UT on a part-time basis (maximum 6 hours of course work per quarter), as eligible for a waiver of out-of-state tuition. The student must apply for a waiver prior to the date of registration each quarter. Forms are available from the Residency Clerk in the Office of Graduate Admissions and Records.

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

The University is authorized by statute to withhold diplomas, grades, transcripts, and registration privileges until student debts and obligations (other than Student Loan Fund notes) owed to the University are satisfied.
The Hilton A. Smith Graduate Fellowships 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 maintenance fees. Application packets are available from the Office of Graduate Admissions and Records after November 15. Completed applications, including all supporting materials, must be submitted to the Office of Graduate Admissions and Records, February 15. Offers of awards are announced by March 15.

Employment: Three sources of student employment are coordinated by the Financial Aid Office. (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 (FAF) or Family Financial Statement (FFS). (2) Job Location and Development 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 of 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. Referals are made in accordance with the student's skills and interests regardless of financial need. Students fulfilling either part-time or summer employment are urged to contact the Financial Aid Office.

Loans: Three types of loans are administered by the Financial Aid Office. 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 six to eight weeks' total processing time when applying for a loan. Students must apply through the Financial Aid Office, 305 Student Services Building. 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 academic standards. Information and applications can be obtained from Financial Aid Office, 115 Student Services Building.

Veterans' Benefits: Veterans, and widows or widowers of deceased veterans, are eligible for benefits provided by the Veterans Affairs Office, National Service Center, 1405 State Avenue. Administration for courses loads of 9 or more graduate hours each quarter.

Student 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 be assigned to any residence hall. Graduate students often prefer accommodations offered in Memore and the Apartment Residence Halls. Memore Hall offers community living units for groups of six to ten students with personal responsibility emphasized. The Holt Avenue Apartment Residence Hall accommodates students in groups of four. It is the responsibility of each resident to maintain the areas in conformity with University standards. Further information can be obtained from the Office of Residence Halls, 405 Student Services Building.

A limited number of assistant head resident positions are available for single graduate students. The assistant head resident aids the head resident in coordinating and supervising operations of the hall. This is a live-in position with part-time responsibilities on a nine-and-a-half month appointment. Further information can be obtained from the Office of Residence Halls, 405 Student Services Building.

Married Students: The University provides excellent apartment facilities in several locations for married students. Information and application for these facilities may be obtained from the Office of Rental Properties, Stadium Hall.

Campus Housing: Information and assistance in locating off-campus housing are available in the Off-Campus Housing Office, 335 University Center.

Vehicle Operation and Parking

The University of Tennessee endeavors to provide adequate facilities for vehicles operated by students and staff. Parking areas available for parking are necessarily limited. There is heavy traffic congestion within the campus area, large student parking areas are prone to the problems of the campus. Presently, FREE bus service is provided from the Main Campus to the Agricultural Campus. Also, bus service is provided to Maried Student Housing Areas at a nominal fee.

Each person who operates a motor vehicle in connection with attendance or employment at the University must register that vehicle with the 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; security, and on the Campus Information Center at Circle Park.

Services to the Physically Disabled

Services for students with physical disabilities 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 such students.

These services include assistance during registration (preregistration, collection of class schedules, payment of fees, drop and add); 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 access and facilities for 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 academic support services 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. The office also assists with ordering recorded textbooks. As the needs of disabled students vary, the process involves individualization to accommodate the particular needs of the Handicapped Student Services brochure.

The University Library

The University of Tennessee, Knoxville Library owns approximately 1,500,000 volumes, more than 2,500,000 manuscripts, 62,000 microfilm reels and 1,400,000 items of maps, United States and United Nations documents, and more than 20,000 periodicals and other serial titles, which are received annually. The library's membership in the Association of Research Libraries reflects the University’s emphasis on graduate instruction and research and the support of large, comprehensive collections of library materials.

Library holdings in Knoxville are housed in the James D. Hoskins (Main) Library and its branch libraries for agriculture-veterinary medicine and music. Undergraduate library holdings are temporarily housed in Dunn Hall and Humanities & Social Sciences while the John C. Hodges Library undergoes extensive expansion.

The Special Collections section in the Main Library is a repository of regional and local materials, Tennessee, and special collections, including legislative papers and manuscripts. For more information, see the figures. The Radiation Biology Archives is a facility for the study of radiation biology and of the biological effects of ionizing radiation. 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
and special user's guides are also available.

The Annals of Systems announce systems, equipment, and services available from the UT Computing Center. Both guides are available at the UT Computing Center and via the DECsystem-10 User's Guide, which describes the use of the IBM computer, three terminals, a large digitizing tablet, and a plotter, is located in the user work area in the Art and Architecture building.

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.

UTCC publishes the IBM User's Guide, which describes the use of the IBM computers and the DECSystem-10 User's Guide, which describes the use of the DEC computer. Both guides are available at the UT Book Store.

The Annals of Systems periodically offers intensive training sessions on the use of IBM and DEC computers for faculty, staff, and graduate students. UTCC also offers a non-credit short course each summer in topics such as programming languages and special purpose programs.

The University of Tennessee Computing Center (UTCC) provides computer facilities and services for the University's teaching, research, public service, and administrative activities. UTCC operates and maintains high-performance digital computers that provide computing services on campus and supplies computing services to the Knoxville region. UTCC maintains eight remote job entry stations for batch work and fifteen sites for interactive computer work on the Knoxville campus and supplies computing services to fifteen sites for interactive computer work on the Knoxville campus.

The Division of International Education, located at 205 Alumni Hall, maintains students' official immigration records and handles questions regarding immigration regulations. The office staff serves as advisors on personal and related problems. Operation problems are addressed during the regular working day and student travel abroad.

The University of Tennessee Computing Center (UTCC) provides computer facilities and services for the University's teaching, research, public service, and administrative activities. UTCC operates and maintains high-performance digital computers that provide computing services on campus and supplies computing services to the Knoxville region.
The University of Tennessee Space Institute

Kenneth E. Herdell, 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 take-home 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, and Physics. In addition to the fundamental studies characteristic of our disciplines, research opportunities are available in many aspects of atmospheric and space flight such as aerodynamics, atmospheric engineering, propulsion, propulsion 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 has been selected as a Center of Excellence in laser applications and offers graduate studies and research opportunities in this area to qualified doctoral students and post-doctoral scientists.

The Institute was established in part to increase the research and engineering resources of the University through education and research 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 unusually favorable and significant research experience in these areas. Students who enroll at UTSI are admitted to The Graduate School of UTK.

Prerequisites

Graduate work in any program must be preceded by sufficient undergraduate work in the particular fields to satisfy the department that the student can do graduate work.

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 purpose of the Center is to: (1) to assist and support the academic institutions of the state, public and private, in pursuing water resources research programs needed by the state; (2) to provide information, dissemination and technology transfer services to state and local government bodies, academic institutions, professional groups, environmental organizations, and others, including the general public, who have an interest in water resources matters; (3) to promote education in fields relating to water resources and to encourage the entry of promising students into careers in these fields.

Off-campus Graduate Centers

Kingston University Center: UTK offers at Kingston 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, Kingston 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, in industrial 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 late afternoons, evenings, and Saturdays, with research facilities provided by and used in cooperation with the Oak Ridge Associated Universities (ORAU).

This program is supported under a sub-contract with ORAU with principal support coming from the Martin Marietta Corporation. UT/O 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, 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 Westbrock, Director, Nashville Graduate Engineering Program, Tenth 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 major in Educational Administration and Supervision and Vocational-Technical Education. 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 Biological Division of the Oak Ridge National Laboratory.

For complete information concerning the program see page 150.

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. The UT School of Social Work also offers a Doctor of Philosophy degree with a major in Social Work.

For complete information concerning the programs, see page 161.

General Regulations of The Graduate School

Advisor/Major Professor

Every graduate student must have an advisor from the major department. The advisor advises the student about the student's research, and facilities communication within the major department and to The Graduate School. The advisor must approve the student's program each term.

Many departments assign temporary advisors 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 advisor requests a professor in the major department to serve as the advisor. 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 particular fields to satisfy the department that the student can do graduate work.
ate work successfully in the chosen field. Individual undergraduate records are exam-
ined and evaluated by the appropriate department before admission to a degree
program. Questions about program prereq-
usities should be addressed to the advisor.

Course Listings

Each course listing in the Graduate Catalog contains information in abbreviated
form. The course number indicates the level
at which the course is taught. All 3000-6000 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 other-
wise. To receive graduate credit for these, a student must so indicate on the registration
material.

The official course title appears in bold-
faced type following the course number.

Courses may be cross-listed with two or
more departments, an arrangement indi-
cated by a parenthetical statement: (Same
description indicating the content to be cov-
ered).

Prerequisite courses must be taken prior
to the course in question. Corequisite
courses may be taken prior to or concur-
tently with the specific course.

Recommended prerequisites should be taken previously but are not mandatory.

Some courses may be repeated for a
course credit up to a maximum of one-fourth of the total credit
hours in a Master's degree program may be
limited to one-fourth of the total credit
hours in a student's program is

S/NC (carries credit hours, but no quality
points), P indicates progress toward
adequate progress.

NC courses in a student’s program is

NP indicates no progress or inade-
quate progress.

Students have the responsibility to assure
that they have been dropped. Otherwise
they may receive a grade of F in the course.

A proficiency examination may be given in
academic courses offered for graduate
credit. Applications for proficiency examina-
tions are available in the Office of the
Registrar, 209 Student Services Building. To
be eligible, a student must be admitted to
The Graduate School. The request for
examination must be approved by the head
of the department offering the course. Stu-
dents applying for this privilege must
present evidence to the department head
that they have the knowledge and abilities
expected of graduate students.

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tions are available in the Office of the
Registrar, 209 Student Services Building. To
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The Graduate School. The request for
examination must be approved by the head
of the department offering the course. Stu-
dents applying for this privilege must
present evidence to the department head
that they have the knowledge and abilities
expected of graduate students.

S/NC grading. Refer to section on Grading
meanings:

A (3 quality points per quarter hour),
satisfactory performance.

B (2.5 quality points per quarter hour),
less than satisfactory performance.

C (2 quality points per quarter hour),
performance will be 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 unsatis-
factory performance and cannot be
used to satisfy degree requirements.

I (no quality points), a temporary grade
indicating that the student has per-
formed satisfactorily in the course but,
due to unforeseen circumstances, has
been unable to finish all require-
ments. 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 Gradu-
ate Admissions and Records at the end of the
quarter, the I will be changed to an F. The course
will not be counted in the cumulative
grade point average until a final grade
is assigned. No student may graduate
with an I on the record.

S/NC (carries credit hours, but no quality
points). S is equivalent to a grade of
B or better, and NC means no credit earned.

Courses where NC is received may be repeated for a grade of F, unless it can be demonstrated that
the request for withdrawal is based on cir-
mstances beyond the student’s control. In the
event of F, NC grading is allowed only where
indicated in the course description in the
Graduate Catalog. The number of S/
NC grading is not limited to one-fourth of the total credit
hours in a student's program is

P/NP (carries credit hours, but no quality
points). P indicates progress toward
completion of a thesis or dissertation.
P indicates no progress or inade-
quate progress.

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

No grade average unit for a final grade
rises. A student may not do additional work to
raise a final grade.

Proficiency Examinations

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academic courses offered for graduate
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tions are available in the Office of the
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be eligible, a student must be admitted to
The Graduate School. The request for
examination must be approved by the head
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dents applying for this privilege must
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of the department offering the course. Stu-
dents applying for this privilege must
present evidence to the department head
that they have the knowledge and abilities
expected of graduate students.

A proficiency examination may be given in
academic courses offered for graduate
credit. Applications for proficiency examina-
tions are available in the Office of the
Registrar, 209 Student Services Building. To
be eligible, a student must be admitted to
The Graduate School. The request for
examination must be approved by the head
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of the department offering the course. Stu-
dents applying for this privilege must
present evidence to the department head
that they have the knowledge and abilities
expected of graduate students.
A fee of $22 per credit hour must be paid before each examination. Proficiency examinations may not be used to raise the grade or change the credit in a course previously completed, nor may such an examination be repeated. Proficiency examinations taken at other institutions are not transferable.

**English Proficiency**

Any student whose native language is not English must pass a TOEFL score of at least 525 unless he/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 (or another course assigned by the English Department) for undergraduate credit and pass with a grade of C or better. A student may not take more than 6 additional hours of course work while enrolled in English 1221. Those students whose scores indicate that they are not prepared to enter English 1221 will be referred to a program of intensive English study prior to taking the course.

**Law Courses**

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

A grade of S will be recorded in the Dual J.D.-M.B.A. program. Grades must be earned according to the grading system of the respective graduate school. Grades acceptable to meet degree requirements. Only one cumulative GPA (law or graduate) will be carried on the student's transcript until graduation, at which time both the graduate and law cumulative will be added to the permanent records.

A student enrolled in the DBA program may take up to 9 semester hours of law courses for the supporting area under the arrangement described on p. 36.

**Auditors and Audited Courses**

Persons who wish to attend certain classes regularly, without obtaining the credit for the course for any reason (transfer credit, graduate work, etc.) or for no reason (attending a course for personal interest), etc., may do so by completing a graduate application, paying the application fee, registering as an auditor, and paying regular fees. Graduate students paying regular fees also are entitled to audit courses.

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

**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 before any transfer of credit will be considered.

To be transferred into a graduate program at UTK, a course must:

1. be taken for graduate credit;
2. carry a grade of B or better;
3. be a part of a graduate program in which the student had a B average;
4. not have been used for a previous degree; and
5. be approved by the student's graduate committee and The Graduate School on the Admission to Candidacy form.

Courses transferred to any graduate program will not affect the minimum residence requirements for the program, nor will they be counted in determining the student's grade point average. Credits transferred cannot be used to meet the 5000- or 6000-level course work requirements. Credit for extension courses taken from other institutions is not transferable, nor is credit for any course taken at an unaccredited and/or foreign institution.

**Master's degree**

A maximum of 9 quarter hours (or 6 semester hours) taken from institutions outside The University of Tennessee may be transferred to a student's Master's program. In addition, the student may transfer courses taken at other campuses of The University of Tennessee. The total transfer work accepted may not exceed one-half of the student's full program of course work. Transferred courses must have been completed within the six-year period prior to receipt of the degree. They will be placed on the student's UTK transcript only after admission to candidacy.

**Doctoral degree**

A maximum of 9 quarter hours or 6 semester hours taken from institutions outside The University of Tennessee may be transferred to an Ed.D. program. Transferred courses in the last 45 hours taken for the degree must have been completed within the six-year period prior to the receipt of the degree. They will be placed on the student's UTK transcript only after admission to candidacy.

**Academic Termination**

Graduate education requires continuous evaluation of the student. This evaluation includes not only periodic objective evaluations such as the cumulative grade point average, performance on comprehensive examinations and acceptance of the thesis or dissertation, but also subjective appraisal by the faculty of the student's progress and potential. Continuation in a program is...
Recommendations for Advanced Degrees

Master's Degrees

Master's degree programs are available with thesis and non-thesis options. 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 MBA and the M.S.W. A complete list is found under "Major and Degree Programs," 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 degree.

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 committee. In thesis programs, a minimum of 9 quarter hours of credit in the major must be earned in course 5000 while the student is preparing the thesis. The Master's degree may be entirely from one major subject or may be distributed between one or more areas. In a 45-hour program the major subject must include at least 18 hours of graduate coursework, exclusive of course 5000, and a minor must include no fewer than 9 nor more than 18 hours of graduate credit.

At least two-thirds of the minimum required hours in a Master's degree program must be taken at UTK in courses numbered at or above the 5000 level. Only 9 thesis 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 16). 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 prerequisites 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 he or she plans to graduate.

Thesis Registration: A student must be registered for course 5000 each quarter during the time of 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 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 last day of classes for the spring and acceptance of theses by The Graduate School. Final examinations not properly scheduled must be repeated. The final draft of the thesis must be approved by the thesis 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.

Thesis: The thesis represents the culmination of an original research project completed by the student. It is prepared according to the UTK Guide to the Preparation of Theses and Dissertations. Two copies of the thesis must be approved and accepted by The Graduate School on or before the deadline specified each quarter in the Graduate School catalog. Each copy must include an approval page 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 must complete 15 hours of course work with a 3.0 average or higher in the major and related fields. Among these 15 hours are at least 9 hours of 5000. The student must be registered for course 5000 each quarter during the time of the non-thesis degree registration.

Final Examination for Non-Thesis Students: A non-thesis student must pass a final oral or 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 using University facilities may pay a fee of $115 instead of registering. Students finishing incomplete courses, however, must register for a maximum 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 Limits: Candidates have six calendar years from the time of enrollment in The Graduate School to complete the degree. Students who change degree programs during this six-year period may be granted an extension after review and approval by The Graduate School. In any event, courses used toward a Master's degree must have been taken within six calendar years of graduation.

Specialist in Education Degree

The Specialist in Education (Ed.S.) degree is offered with majors in Curriculum and Instruction, Educational Administration and Supervision, Educational Psychology and Quantitative Methods, Research in Guidance, Safety Education and Service, and Vocational-Technical Education. Admittance to the Ed.S. program requires acceptance by The Graduate School, and review and acceptance by the department or area in which the degree is offered. It is recommended that students who apply for the degree be working in a field of related work experience. Additional information on admissions requirements for the degree are published quarterly in the Graduate School catalog.

The Graduate School/Specialist in Education Degree

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

Course Requirements: The student's program involves a minimum of six quarters of study totaling not fewer than 30 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 with a Master's degree, or with acceptable work beyond the Master's degree, may take program requirements modified upon recommendation of the student's committee. However, no modifications will be permitted in examination and research requirements, nor in the minimum 9 graduate hours.
Doctoral Degrees

Three doctoral degrees are available for students of doctoral education (Ph.D.). Doctor of Education (Ed.D.), and Doctor of Business Administration (DBA). Programs are listed under "Majors and Degree Programs," pages 8-9. For specific degree requirements, consult individual program descriptions listed by college and department in this Catalog. See also the chart, page 22, for a summary of procedures for doctoral degrees.

Doctoral programs include a major field or 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 6000-level courses, usually a minimum of 9 quarter hours, at UT. A doctoral program includes a minimum of 36 hours of graduate coursework beyond the master's degree, graded A-F, plus the minimum 36 hours of dissertation coursework in course 6000. Additional work taken for S/N credit grading may comprise up to one-fourth of the student's total graduate hours.

Doctoral Committee: The student and the major professor identify a doctoral committee composed of at least four faculty members, holding the rank of Assistant Professor or above, three of whom, including the chair, must be approved by the Graduate Council to direct doctoral research. At least one member must be a departmental member other than that of the student's major field. This committee is nominated by the student's doctoral program and approved by The Graduate School.

Continual Registration: The student must register continuously for course 6000 while working on the dissertation and a finalexamination is approved and accepted by The Graduate School. A minimum total of 36 hours of coursework in course 6000 is required before the dissertation will be accepted. A student who is not using faculty services and/or university facilities for a period of time may request leaves of absence from dissertation research up to a maximum of eight quarters. The request will be considered by The Graduate School upon recommendation of the department head.

Doctoral Examinations: Departments may, at their option, administer diagnostic and/or placement examinations in individual stages of the student's doctoral program. Succession (successions of a student's major professor identify a doctoral committee may specify, will be conducted by the student's committee. Final examinations not properly scheduled must be repeated. The dissertation, in the form approved by the major professor, must be distributed to the committee at least two weeks before the examination. The examination is announced publicly and is open to all faculty members.

Language Requirements: Candidates for the Ph.D. degree may be required to demonstrate a reading knowledge of at least one foreign language in which there exists a significant body of literature relevant to the major field of study. Refer to the descriptions of individual programs. The doctoral comprehensive examination (oral or written) or the student's doctoral committee will determine the content, nature and timing of the foreign language requirement.

Admission to Candidacy: The Admission to Candidacy form, signed by the student's committee, is submitted to the Office of Graduate Admissions and Records before the student has completed 18 hours of course work in the Ed.D. program. A qualifying examination may be required for admission to candidacy if the student has a Master's degree at least six years or more prior to admission to the program. The examination may be written and/or oral.

Research Requirements: See the program descriptions for individual departments for listings of theses, problems in lieu of theses, and non-thesis options. Some departments offer only a thesis program. In the non-thesis program, a candidate will study research methods and findings and will demonstrate skill in adapting them to professional needs as defined by the major department.

Diagnostic or Placement Examinations: Any student in the major field, and any collateral field, may be required to take a diagnostic examination to show that, in the judgment of the faculty, the doctoral student is capable of completing the dissertation. Thus, its successful completion indicates mastery of the major field and any collateral field, and fitness to continue with the more specialized aspects of the doctoral program.

To aid the student's preparation to continue doctoral studies at UT, qualifying and comprehensive examinations are designed to test the student's progress, general knowledge of fundamentals of the field, and fitness to continue with the more specialized aspects of the doctoral program.

The comprehensive examination for the field's last examination, 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, general knowledge of fundamentals of the field, and fitness to continue with the more specialized aspects of the doctoral program.

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

The faculty of the graduate program and/or the student's doctoral committee will determine the content, nature and timing of the foreign language requirement.

Admission to Candidacy: The Admission to Candidacy form, signed by the student's committee, is submitted to the Office of Graduate Admissions and Records before the student has completed 18 hours of course work in the Ed.D. program. A qualifying examination may be required for admission to candidacy if the student has a Master's degree at least six years or more prior to admission to the program. The examination may be written and/or oral.

Research Requirements: See the program descriptions for individual departments for listings of theses, problems in lieu of theses, and non-thesis options. Some departments offer only a thesis program. In the non-thesis program, a candidate will study research methods and findings and will demonstrate skill in adapting them to professional needs as defined by the major department.

Diagnostic or Placement Examinations: Any student in the major field, and any collateral field, may be required to take a diagnostic examination to show that, in the judgment of the faculty, the doctoral student is capable of completing the dissertation. Thus, its successful completion indicates mastery of the major field and any collateral field, and fitness to continue with the more specialized aspects of the doctoral program.

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

The faculty of the graduate program and/or the student's doctoral committee will determine the content, nature and timing of the foreign language requirement.
tion. When the student is prepared to take a language examination, he/she should complete an Application for Doctoral Language Examination at the Office of Graduate Admissions and Records in accordance with the dates and times for the examinations printed in the Graduate School News. Satisfactory completion (grade of B or better) of 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 any language requirements (for Ph.D.), and maintaining at least a B average in all graduate course work. Admission to candidacy must be approved at least two full quarters prior to the date the degree is to be conferred. Each student is responsible for filing the application for 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 important in conveying to others the results of such research. A student should be registered for the number of dissertation hours representing the fraction of effort devoted to this phase of the candidate's program. Thus, a student working full time on the dissertation should register for 12 hours of 6000 per quarter. 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 they have examined the final copy and found that it's form and content demonstrate scholarly excellence. Doctoral forms and a thesis card are also submitted at this time. The student should check with the department head concerning additional required copies of the dissertation.

Time Limit: Comprehensive examinations must be taken within five years, and all requirements must be completed with eight years, from the time of a student's first enrollment in a doctoral degree program.

Summary of Procedures for Master's and Specialists in Education Degrees

<table>
<thead>
<tr>
<th>PROCEDURES</th>
<th>UNDER DIRECTION OF</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission as a potential degree candidate</td>
<td>Office of Graduate Admissions and Records and Major Department</td>
<td>Prior to completing 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

- Placement of name on graduation list
- Application for diploma
- Payment of graduation fee
- Scheduling of final examination
- Final examination(s)
- Removal of incomplete(s)

GRADUATION REQUIREMENTS FOR THESIS/PROBLEMS OPTIONS

- Placement of name on graduation list
- Application for diploma
- Payment of graduation fee
- Submission of thesis/problems to Master's/Ed.S. committee
- Scheduling of final examination
- Final examination(s)
- Approval and acceptance of final copy of thesis and thesis card
- Removal of incomplete(s)

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

<table>
<thead>
<tr>
<th>PROCEDURES</th>
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<tbody>
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<td>Office of Graduate Admissions and Records and Major Department</td>
<td>Prior to completing 18 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 two full quarters prior to graduation***</td>
</tr>
<tr>
<td><strong>GRADUATION REQUIREMENTS</strong></td>
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</tr>
<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>Payment of graduation fee</td>
<td>Bursar’s Office</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 was established in 1889 as one of the first five institutions in the U.S. to establish an Agricultural Experiment Act by the U.S. Congress. The passage of the Hatch Experiment Station Act, established by the University's Board of Trustees and the Hatch Experiment Station Act, established by J.I. Sewell, Assistant Dean, was initiated through the efforts of 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. Sowder, Dean
E. W. Blount, Associate Dean
J. C. Nutter, Professor

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 Institute of Agriculture 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, Lebanon, Crossville, Greenbrier, Martin and a forestry branch station at Oak Ridge. Professional and technical staff are in residence at these locations.

**Agricultural Extension Service**

M. L. Downey, Dean
T. H. Horton, Associate Dean
J. C. Nutter, Professor
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 information fields by a specialist staff, members of which are stationed either in Knoxville, Nashville, or Jackson.

The Agricultural Extension Service operates administratively as one of four units of the Institute of Agriculture. For administration the state is divided into five districts with supervisors located in their respective districts. District headquarters are maintained in Knoxville, Chattanooga, Cookeville, Nashville, and Jackson.

The Agricultural Extension Service operates as a three-way partnership among county, state, and federal governments. The University of Tennessee represents state and federal government and a County Agricultural Extension Committee represents county government in this partnership.

**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 placed on professional training through 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 Mechanization, Animal Sciences, Entomology and Plant Pathology, Food Technology and Science, Ornamental Horticulture and Landscape Design, and Plant and Soil Science. Majors are only 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 coursework. A complete listing of majors is shown on pages 3-5.

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.

The Department of Agriculture Economics and Rural Sociology offers programs of graduate study leading to the Ph.D. and M.S. The doctoral program includes concentrations in agricultural marketing and price analysis, agricultural policy, farm management and production economics, natural resource economics, and rural development. The M.S. program may be completed under a thesis or non-thesis option and may include an emphasis in agricultural economics or rural sociology. For specific information, contact the Department Head.

THE MASTER'S PROGRAM

Thesis Option: A minimum of 45 hours of graduate coursework is required. In the agricultural economics emphasis, 9 hours of agricultural economics and 9 hours of economic theory are required. Both non-thesis and thesis methods are required. In the rural sociology emphasis, 9 hours of sociological theory and 3 hours of statistics are required. Each student must successfully complete a final oral examination.

Non-Thesis Option: A minimum of 48 hours of graduate coursework is required. Minimum coursework in theory, quantitative methods and statistics is the same as for the thesis option. Each student must successfully complete both written and oral comprehensive examinations.

THE DOCTORAL PROGRAM

A minimum of 108 hours of graduate coursework, including 36 hours of dissertation research, but excluding any master's research credits, is required. A minimum of 15 hours of economic theory, 9 hours of quantitative methods and 21 hours in agricultural economics are required. Comprehensive exams consist of four written exams and one oral exam. The written exams are in general agricultural economics, economic theory, quantitative methods and the area of concentration. Prerequisite is for the writing the economic theory exam with a sufficiently academic record in specific econometric theory courses.

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 for planning; fall trips arranged. Prereq: Agriculture 1110 and Economics 2120. 3 hrs and 1 lab, F.

4140 Agricultural Production Economics I (3) Analysis of microeconomic theories to produce and allocate resources in agricultural and natural resource markets; price and quantity determination for agricultural goods; institutional and economic policy. Prereq: Agriculture 1110 and Economics 2120.

4302 World Agriculture and Trade (3) Economic bases of world agricultural production and trade; resource allocation, production, and distribution; market mechanisms; price and income determination in the commercial policy. Prereq: Agriculture 1110 and Economics 2120; or consent of instructor.

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. Prereq: Agriculture1110 and Economics 2120; or consent of instructor.

4310 Agricultural Finance (3) Nature and use of sources and uses of credit; farms and banks; analysis of farm credit. Agricultural insurance and taxation. Prereq: Agriculture 1110 and Economics 2120.

4320 Agricultural Policy (3) Meaning of agricultural policy in democratic society, relationship of farm groups to public policy; problems relating to policy, agricultural production and marketing; price and income determination in the commercial policy. Prereq: Agriculture 1110 and Economics 2120; or consent of instructor.

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

4430 Management of Farm Supply and Marketing Firms (3) Operation of firms selling farm supplies and merchandising agricultural products. Emphasis on accounting data and economic theories for decision making. Prereq: Agriculture 1110 and Economics 2120.


5030 Advanced Agricultural Marketing (3) Economics of market structure and pricing; perfect markets; monopoly; oligopoly; market location and transfer costs; pricing and distribution; resource allocation and market flows; measuring efficiency. Prereq: 3102 or 3202 plus 3 hrs of instructor.

5060 Thesis (1-15) P/MP

5002 Non-Thesis Graduation Completion (3-15) Requires completion of all degree requirements. Prereq: registration and approval by the department. May be repeated during any quarter when such a student uses University facilities and/or faculty time before degree is completed. May be repeated toward degree requirements. May be repeated S/N only. E

5120 Agricultural Production Economics II (3) Theoretical and empirical concepts of agricultural allocation and production; price and income determination in the commercial policy. Prereq: Agriculture 1110 and Economics 2120.

5210 Seminar: Agricultural Policy (3) Open.

5220 Research Methodology (3) Nature of scientific methodology on world, presentation, form, arguments, and literature reviews. Prereq: completion of research methods course in agricultural economics. Prereq: Consent of instructor.

5230 Research (3) Special research problems in agriculture, economics and rural sociology. Gathering, analyzing and integrating data and writing reports. Prereq: Consent of instructor.

5240 Agricultural Marketing Analysis (3) Analysis of marketing, conduct, and performance of agricultural marketing systems; application of pricing theory concept to real-world industries. Methods used in the analysis of marketing, conduct, and performance. Prereq: Economics 3115 or Economics 5115 or consent of instructor.

5360 Advanced Land and Natural Resource Economics (3) Economic efficiency in natural resource allocation; issues in project and policy evaluation. Prereq: Economics 3115 and Economics 5115, or consent of instructor.

5420 Agricultural Policies and Rural Sociology (3) Economic efficiency in natural resource allocation; issues in project and policy evaluation. Prereq: Economics 3115 and Economics 5115, or consent of instructor.

5540 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; technology and change; national and international food policy. Prereq: 5240 or consent of instructor.

5610 Linear Programming (3) Techniques with empirical applications to problems of firms and region. Emphasis on application of linear programming and other decision techniques using computer and interpretation of results. Prereq: Statistics 3130 or Economics 5115 or consent of instructor.

5620 Agricultural Price Analysis (3) Application of various research methods to analysis of price structures; specification and estimation of demand models and interpretation of results. Prereq: 3102 or 3202, or consent of instructor.

6000 Doctoral Research and Dissertation (3-18) P/MP

6220 Seminar in Agricultural Economics (3) Topics selected from the areas of economics of production, consumption, and price theory, regulation and public policy, and issues in project and policy development. Prereq: 5240. Prereq: 5240 or consent of instructor. F

6240 Agricultural and Rural Transformation Problems (3) Development of policy and development program related to agricultural modernization, food supply, and rural living. Decision-making process and the analysis of policy and development programs. Prereq: 5240. Prereq: 5240 or consent of instructor. F

6310 Agricultural Supply analysis (3) Estimating agricultural supply relationships by using aggregated data and econometric functions; production programming, simulation and farm growth models with emphasis on application to agricultural development and expansion theory and model attributes. Prereq: 5130 or consent of instructor.

6320 Marketing and Resource Use (3) Institutional and international perspectives on the use of natural resources in the development of natural resources, the use of natural resources as inputs to agricultural industries, and the use of natural resources as inputs to agricultural industries, and the use of natural resources as inputs to agricultural industries, and the use of natural resources as inputs to agricultural industries, and the use of natural resources as inputs to agricultural industries, and the use of natural resources as inputs to agricultural industries, and the use of natural resources as inputs to agricultural industries, and the use of natural resources as inputs to agriculture.
5110 Agricultural Machinery Systems Analysis (3) Analysis of current field machinery; selection criteria for sequent operations; machinery for unique and alternate production and harvesting systems; operational management. Prereq: 4210, 2 hrs and 1 lab, Sp, A.

5115 Selected Topics in Agricultural Mechanization (3) Lecture, group discussion, and individual study on specialized agricultural mechanization developments. May be repeated. Maximum 9 hrs. F, S.

**Agricultural Extension Education**

**MAJOR DEGREE**

**Agricultural Extension**  
M.S.

Professors:  
R. L. Polley (Head), Ph.D., Ohio State;  
A. M. Berth, Ph.D., Rutgers;  
R. A. Derleth, Ph.D., Doctoral Science.  
5210 Agricultural Extension Administration (3) Principles and techniques in administration of extension programs. Emphasis on organizational structure and functional areas. Prereq: 3210 and consent of instructor, W. A.

5220 Seminar (3) Seminar review of agricultural extension methods. Prereq: 3110 or consent of instructor. Spr, A.

5230 Supervision of Agricultural Extension Programs and Personnel (3) Theories of human effectiveness, principles of successful supervision applied to various parts of county, district and other extension programs, and planning for effective office supervision. Prereq: 3210 or 5220 and consent of instructor. W.

**Animal Science**

**MAJOR DEGREE**  
Animal Science  
M.S., Ph.D.

Professors:  
A. H. Thomas, Ph.D., Ohio State;  
K. M. Christ, Ph.D., Rutgers;  
R. A. Thompson, Ph.D., Doctoral Science.  
5310 History, Philosophy and Objectives of Agriculture (3) Historical and philosophical foundation of informal adult education and research methodology, supervision and administration as well as technical subjects in animal fields or agriculture and home economics.

5. An oral examination covering the thesis and coursework is required.

3110 Introduction to Agricultural Extension (3) History, philosophy, organization; teaching methods and relationships with other educational agencies. Graduate credit only. Prereq: 3110 and consent of instructor.

4110-4210 Field Studies (3, 3) Supervised work experience with county extension agents in a designated county. Prereq: 3110 and consent of instructor. Requires living off-campus for a specified time. Sp, F.

5000 Thesis (1-15) Master's thesis only.

5160 Special Problems in Agricultural Extension (1-6) May be repeated. Maximum 9 hrs. E.

5170 Long-range Extension Program Planning (3) Development of county extension program based on analysis of problem situations and specific characteristics of areas. Prereq: 3110 or consent of instructor.

5220 Seminar (3) Review of literature and development of agriculture in extension methods. Prereq 3110 or consent of instructor. Sp, A.

5320 Evaluation in Programs of Agricultural Extension (3) Principles, instruments, and techniques of identifying, gathering, analyzing and using data to appraise, evaluate and to determine progress of clientele. Prereq: 5210 or consent of instructor, W.

5330 Supervision of Agricultural Extension Programs and Personnel (3) Theories of human effectiveness, principles of supervision and the final oral examination which consists of comprehensive examination and a defense of the thesis.

**THE DOCTORAL PROGRAM**

The doctoral program requires a minimum of 72 quarter hours of coursework and a minimum of 12 quarter hours of research and dissertation. Minimum 72 quarter hours of coursework must be at the 6000 level, exclusive of Doctoral Research and Dissertation. Of these, a minimum of 9 must be at 6000 level. A master's degree must be completed prior to entrance into the Ph.D. program. A minimum of 5 faculty members constitute the student's advisory committee, of which at least one must be outside the science. The major professor will be the chairperson. The student and the major professor select a program of study depending on the student's areas of concentration and professional goals. The advisory committee approves the coursework, the dissertation research proposal and the defense if these should be a foreign language requirement. The advisory committee conducts the comprehensive examination and the final exam.

5310 Anatomy and Physiology of Farm Animals (4) Gross anatomy and physiology of different mammalian body systems, including the nervous, muscular, respiratory, skeletal, circulatory, digestive, urinary and reproductive systems. Prereq: 3210 or Agriculture 1130. 3 hrs and 1 lab. F, W.

5320 Physiology of Reproduction (3) Comparative anatomy and physiology of reproductive systems of
higher vertebrates, gametogenesis, fertilization, implantation, pregnancy, parturition and lactation; endocrine regulation of reproductive phenomena. Prereg 3210 or consent of instructor. (Same as Zoology 5220.) 2 hrs and 1 lab. F, W, Sp.


3410 Endocrinology in Animals (3) Basic chromosomal mechanism of hormone with emphasis on mammalian principles and exceptions such as linkage and cytological interference. Introduction to the biochemical basis of hormone and its significance. Introduction to hormone relationships to the inter-relationship between animals and non-animal systems. Prereg: Agriculture 1130 and consent of instructor. 3 hrs and 1 lab. W, F, Sp.


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3410 Endocrinology in Animals (3) Basic chromosomal mechanism of hormone with emphasis on mammalian principles and exceptions such as linkage and cytological interference. Introduction to the biochemical basis of hormone and its significance. Introduction to hormone relationships to the inter-relationship between animals and non-animal systems. Prereg: Agriculture 1130 and consent of instructor. 3 hrs and 1 lab. W, F, Sp.

Entomology and Plant Pathology

MAJOR

DEGREE

Entomology and Plant Pathology

M.S.

Professors: L.F. Klotz, J.T. Miles, B.J. DeMott, P.F. Davidson, E.C. Bernard, E. Parnell

Assistant Professors: C.S. Spurgeon, Ph.D., North Carolina State; J.K. Hidy, Ph.D., Ohio State; F.J. Johnson, Ph.D., Louisiana State; P.L. Shurin, Ph.D., Virginia Polytechnic Institute; C.D. Ploin, Ph.D., Clemson.

Assistant to the Dean: E.C. Bernard, Ph.D., Georgia.

Assistant Professors: E.L. Klotz, Ph.D., Ph.D., Netravali, B.B. Reddy, Ph.D., Clemson.

The Department of Entomology and Plant Pathology offers concentrations in economic entomology and plant pathology. Students in economic entomology may further specialize in the research areas of crop entomology, medical and veterinary entomology, insect biology, insect pest management, and biological control. Students in plant pathology may further specialize in the research areas of foliar fungus diseases, soil-borne diseases, nematology, and virology. For further information, contact the Department Head.

ADMISSION REQUIREMENTS

The department requires completion of three rating forms from academic or professional persons, a written statement of interest in entomology or plant pathology, and career goals. It is required that applicants for the Master's program have completed: (1) general biology or zoology, 12 quarter hours; (2) advanced biological sciences, 12 quarter hours; (3) general inorganic chemistry, 9-12 quarter hours; (4) organic chemistry, 4 quarter hours minimum.

DEGREE REQUIREMENTS

Completion of a thesis is required. A minimum of 45 quarter hours of graduate work is approved by the student's committee, including at least 18 hours of graduate credit in the major emphasis in the Thesis 5000. If the student elects a minor, there must be no fewer than 9 nor more than 18 hours of graduate credit in the minor emphasis. Present a detailed course of study schedule for the student's committee, including at least 9 hours of courses approved by the thesis advisory committee. In addition, a final or oral examination is required which both written and oral comprehensive examination must be completed to the satisfaction of the student's committee after the thesis is completed.

4010 Biology of Soil Microorganisms (4) Morphology and physiology of soil invertebrates, decomposition of organic matter, transformations, interactions between microorganisms and higher plants. Pre-requisite: Introductory microbiology or 3130. 3 hrs and 1 lab. F

4030 Forest and Shade Tree Entomology (3) Identification, biology, ecology, and control of forest and shade tree pests. Pre-requisite: 3210 or equivalent. 2 hrs and 1 lab. W

4140 Forest Pathology (3) Symptomatology, etiology, diagnosis, control of forest and shade tree diseases, including wood decay and other diseases important to urban and production forestry. Pre-requisite: 3130 or Forestry 3080. 2 hrs and 1 lab. F

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

5010 Research Methods and Instrumentation in Plant Pathology and Entomology (3) Techniques for laboratory and field research in plant pathology and entomology. 1 hr and 2 labs. F

5110 Plant Disease Diagnosis (3) Identification of plant diseases, disease symptoms, and control measures. Pre-requisite: 3130, S, A

5120 Insect Diagnostic Clinic (3) Identiﬁcation of insect and insect damage to crops, livestock and resi- dents in Indiana. Diagnosis of insect pests, their management, insect related research, disease diagnosis, and toxicological issues. Pre-requisite: 3130 and 5110. 3 hrs. F

5150 Plant Parasites (4) Morphology, phys- iology, taxonomy, and ecology of plant parasite nematodes with emphasis on turf pests. Prerequisite: Basic genetics or equivalent and 3130. 3 hrs and 1 lab. S

5205 Plant Disease Control (3) Basic principles and problems involved in controlling plant diseases. Prerequisite: 3210, W, A

5230 Field Crop and Vegetable Insects (3) Taxono- my, biology, and control of insects affecting field and vegetable crops. Prerequisite: 3130 or equivalent course in applied entomology. 2 hrs and 1 lab. F, A

5240 Plant Virology (5) Virus infections of plants, taxonomy and epidemiology of virus infections; morphology, replication, transcription, purification, characterization, and classification of plant viruses; virology and virological techniques. Prerequisite: 3130 or consent of Instructor. 2 hrs and 2 labs. W, A

5250 Medical and Veterinary Entomology (4) Mor- phology, taxonomy, biology, and control of arthropod pests and vectors of pathogens of man and animals. Ecology and behavior of vectors in relation to pathogen transmission and control. Prerequisite: 3210, phenomenology, or consent of instructor. 3 hrs and 1 lab. S, A

5301 Special Problems in Entomology (1-4) Comprehen- sive individual study of current problems. May be repeated. Maximum 9 hrs. E

5302 Special Problems in Microbiology (1-4) Comprehen- sive individual study of current problems. May be repeated. Maximum 9 hrs. E

5303 Special Problems in Nematology (1-4) Comprehen- sive individual study of current problems. May be repeated. Maximum 9 hrs. E

5410 Seminar (1) Review of literature and current studies in plant pathology and entomological literature. May be repeated. Minimum 3 hrs. W, F, Sp

Food Technology and Science

MAJOR

DEGREE

Food Technology and Science

M.S., Ph.D.

Professors: J. T. Miles, Ph.D., Wisconsin; J. L. Collins, B.S., Maryland; G. J. Ayres, Ph.D., Iowa State; A. R. Morris, Ph.D., T. Linch, M. W. Owecoff, Ph.D., Michigan State; D. R. Lauer, Ph.D., Duke State.

Associate Professors: L. Smith, Ph.D., Washington State; R. E. Edgerton, Ph.D., Purdue; T. M. Siders, Ph.D., North Carolina State; J. D. Shilts, Ph.D., Phila. State; D. C. Miller, Ph.D., Colorado State; M. E. R. F. A. Molitor, Ph.D., The Ohio State University.

The Department of Food Technology and Science offers the Master of Science degree, and Doctor of Philosophy degree, with concentrations in food products, food chemistry and food microbiology. Various commodity interests (dairy, meats, fruits, and vegetables) can be emphasized in all three concentrations by judicious selection of courses and research areas for the dis-sertation. The option of a minor in a collateral area is available. For detailed information, contact the Department Head. The following courses are required for a B.S. degree in food technology, food sci- ence, or a closely related agricultural or basic science discipline. Graduate school rating forms or letters of recommendation from at least 3 persons familiar with the prospective student's academic ability are also required.

THE MASTER'S PROGRAM

1. A thesis is required for the Master's program. Prior to research for the thesis, the student is required to develop a detailed written research plan. Registration for a min- imum of 9 hours of Thesis 5000 is required. In addition, to the thesis requirement, a minimum of 36 hours of graduate course- work is required. This work must be approved by the student's committee and not less than 15 hours of the 45 can be below the 5000 level. The committee may require additional coursework if the stu- dent's progress or background indicates such need.

2. All students are required to include 3 hours of 5100, Seminar, in their program and are expected to attend this course and participate in discussions each quarter hour. Registration of 5240 or equivalent is also required.

3. An oral examination covering the thesis is required.

THE DOCTORAL PROGRAM

1. A thesis is required for the student's Doctoral degree in the field of or a closely related field. A major in the Graduate School of the University may be below the 5000 level. The committee considers the dissertation as required. Scores on the GRE aptitude test are also reviewed.

2. A minimum of 21 or 8 quarter hours credit is required beyond the Bachelor's degree, exclusive of graduate. The committee will determine from the number of quarter hours must be in 6000, Doctoral Research and Dissertation. At least 36 quarter hours of course work must be in 6000-level courses.

3. A minimum of 9 of the 36 quarter hours must be in 6000-level courses for graduate credit must be completed prior to registering for the Department of Food Technology and Sci- ence. The option of a minor in a collateral area is available. For detailed information, contact the Department Head.

4. Each candidate will be required to pass both written and oral comprehensive exams prior to admission to candidacy. A final oral examination is required which includes defense of the dissertation and subject matter that the student's committee considers desirable. For detailed information, contact the Department Head.

3000 Dairy Products I (4) Processing, procurement, and distribution of fresh and condensed dairy products. 3 hrs and 1 lab. W
5140 Food Flavorings (3) Food flavor maintenance and improvement. Natural and synthetic compounds in manufacture of foods with predictable consumer acceptability. Techniques for determining flavor profiles. Prereq: 4210. 2 hrs and 1 lab. W, A.


5159 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.

5200 Thermobiology (3) Functions of heat transfer as related to rate of destruction of microorganisms and their applications to the storage of foods and meats. Prereq: 4110. 2 hrs and 1 lab. W, A.

5420 Instrumental Analysis of Foods (3) Application of current instrumental methods used in control food manufacturing processes. Prereq: 4140. 2hrs and 1 lab. F.

5130 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.

5630 Advanced Food Microbiology (3) Identification of desirable and undesirable microorganisms in food products and their removal by applying various food treatments in modification of microorganisms and their functions in food processing and preservation. Prereq: 4810 or Microbiology 3810. 3 hrs. W.


5520 Food Processing II (4) Role of process technology in modification of food properties; texture, appearance, flavor, and color characteristics. Prereq: 3125, 5140, and Food Science 5109 or consent of instructor. Sp.

6140 Advanced Food Processing (5) Role of processing in modification of food properties; texture, appearance, flavor, and color characteristics. Prereq: 3125, 5140, and Food Science 5109 or consent of instructor. Sp.

Forestry, Wildlife, and Fisheries MAJORS DEGREES

M.S. Wildlife and Fisheries Science

Graduate School rating forms or letters of recommendation from one's advisor with the applicants academic ability are available for the major in Forestry; a thesis or art, science, and technology applied to research, development, and marketing of new food products and processes. Prereq: 4200. 2 hrs and 1 lab. W, A.

Food Science and Technology Seminar 5000 level. The committee may require additional coursework to the student's academic ability for the major in Forestry; a thesis or art, science, and technology applied to research, development, and marketing of new food products and processes. Prereq: 4200. 2 hrs and 1 lab. W, A.

Food Science and Technology Seminar 5000 level. The committee may require additional coursework to the student's academic ability for the major in Forestry; a thesis or art, science, and technology applied to research, development, and marketing of new food products and processes. Prereq: 4200. 2 hrs and 1 lab. W, A.

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Food Science and Technology Seminar 5000 level. The committee may require additional coursework to the student's academic ability for the major in Forestry; a thesis or art, science, and technology applied to research, development, and marketing of new food products and processes. Prereq: 4200. 2 hrs and 1 lab. W, A.
producing multiple services; preparation of a company to enter enterprises as a producer of timber, recreation, and related products. Field trips during the semester include visits to various forest locations.

4230 Forest Resource Policy (3) History of forestry in the United States with emphasis on development of forest resource policies, current problems facing development and management of forest resources, brief survey of policy evaluation, and understanding of reclassification in public and private sectors. 4240 Forest Aerial Photography in Forest-Resource Management (2) Use of conventional aerial photographs in forest resource-management; interpretation of detail, evaluation of forest characteristics, and potential production. Prereq: Plant and Soil Science 3210. 4250 Forest and Resource Management Plans (4) Preparation of site plans for commercial thinning, selection cutting, and clear cutting; estimation of harvest levels, and plantation establishment. 4250 may be taken concurrently 1 hr and 4 hrs. W

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 3 labs. W

4200 Utilization (3) Wood-using industries; processing; manufacturing processes of plywood and composite products. 3 hrs and 1 lab. Overhill weekend plant trips may be required. 2 hrs and 1 lab. F

5011 Problem Analysis in Forest Resources (3) Preparation of a company to enter enterprises as a producer of timber, recreation, and related products. Field trips during the semester include visits to various forest locations.

4230 Forest Resource Policy (3) History of forestry in the United States with emphasis on development of forest resource policies, current problems facing development and management of forest resources, brief survey of policy evaluation, and understanding of reclassification in public and private sectors. 4240 Forest Aerial Photography in Forest-Resource Management (2) Use of conventional aerial photographs in forest resource-management; interpretation of detail, evaluation of forest characteristics, and potential production. Prereq: Plant and Soil Science 3210. 4250 Forest and Resource Management Plans (4) Preparation of site plans for commercial thinning, selection cutting, and clear cutting; estimation of harvest levels, and plantation establishment. 4250 may be taken concurrently 1 hr and 4 hrs. W

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 3 labs. W

4200 Utilization (3) Wood-using industries; processing; manufacturing processes of plywood and composite products. 3 hrs and 1 lab. Overhill weekend plant trips may be required. 2 hrs and 1 lab. F

5011 Problem Analysis in Forest Resources (3) Preparation of a company to enter enterprises as a producer of timber, recreation, and related products. Field trips during the semester include visits to various forest locations.
3230 Seminar in Wildlife Conservation (3) Current studies, problems and issues in wildlife agencies and organizations and their programs. Prereq: 3230 or consent of instructor. W, A.
3210 Seminar (1) Current developments in wildlife agencies and organizations and their programs. Prereq: 3220 or consent of instructor. W, A.
5410 Advanced Topics in Wildlife Conservation (3) Recent advances and concepts, research techniques, and analysis of current problems. Prereq: 4460 and 4460 or consent of instructor. May be repeated. Maximum 6 hrs. Sp, A.
4520 Wildlife Diseases (3) Necropsy of birds and mammals. Recognition of various diseases and methods of controlling them. Various methods in the field and lab. Investigative procedures concerning wildlife diseases. Prereq: 1 cr. zool, 1 cr. microbiology, pathology or parasitology, 4460 or 4460, or consent of instructor. 2 hrs and 1 lab. Sp, A.
5390 Advanced Topics in Fish 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. Sp, A.
5500 Seminar (1) Current literature and developments in ornamental horticulture and landscape design. May be repeated. Maximum 3 hrs. Sp, A.
4530 Plant Propagation (3) Physiology, methodolorticul-ogy, and management requirements for propagation. Prereq: 8 hrs of biological science. 2 hrs and 1 lab.
3110 Greenhouse Management (3) Factors involved in managing greenhouses for production and research. Structures, soils, pest control, nutrition, irrigation, and environmental control. Prereq: 4220, and consent of instructor. 2 hrs and 2 labs. Sp.
4150 Nursery Production (4) Modern methods of production liners, field and container grown woody ornamental plants. History and evolution of nursery production and modern methods. Prereq: 4190, Ag Management 2110. 2 hrs and 1 lab. W.
4160 Nursery Management (3) Modern management methods for wholesale and retail nurseries, garden centers, and landscape contractors. Prereq: 3610, 2 hrs and 1 lab. W.
4180 Park Design (5) Design concepts for parks and outdoor recreation areas. Park site selection, analysis, planning and management as related to needs and natural and environmental resources. Evaluation of aesthetic and functional quality of parks and their impact on environmental quality of rural and nature-recreational environments. Prereq: 4180. 4 hrs and 1 lab. W.
4190 Advanced Landscape Design (4) Comprehensive application of landscape design skills and knowledge through development of major project. Analysis, programing, planting design, construction detailing, estimating, specifications, contracts and bidding. Prereq: 3610, 3620, 3630, 1 cr. and 2 hrs.
4230 Advanced Turfgrass Management (4) Principles and scientific bases of turfgrass culture; adaptation, physiology, management, and utilization of grasses and non-grasses. Generalized influence on grass physiology; use of irrigation and water management; traffic effects and competition; and the physiological influences of plant nutrition and control measures. Prereq: 3620. 3 hrs and 1 lab.
4320 Specialty Floriculture (3) Specific practices in production on small scale plant crops. Production methods for scheduling flowering or vegetative growth of specialty florist crops in controlled environments. Prereq: 3410. 2 hrs and 1 lab. Sp.
4400 Individual Study (1-5) May be repeated. Maximum 15 hrs. Sp.
5000 Thesis (1-15) P/NP only. E.
5100 Special Problems in Ornamental Horticulture and Landscape Design (1-5) May be repeated. Maximum 9 hrs. E.
5110 Self-Directed Course, Development, and Management (4) Principles and applications in development, management and maintenance of small-scale plant crops. Selection and utilization of gross varieties and other plant materials and development of specifications for nutritional, chemical, and mechanical maintenance. Prereq: 4450 and 4460. 4 hrs and 1 lab.
5500 Seminar (1) Current literature and developments in ornamental horticulture and landscape design. May be repeated. Maximum 3 hrs. Sp, A.
4320 Soil Formation, Morphology and Classification (1-4) Methods of soil formation, evaluation and principles of soil use. Soil of use surveys. Prereq: 2130. 3 hrs and 1 lab. W
4330 Soil Survey (2) Techniques of mapping soils, development of mapping legends and documentation of soil and terrain. May be repeated for credit. Prereq or coreq: 4110. 1 hr and 1 lab.
4400 Problems in Plant and Soil Science (1-5) May be repeated. 1 hr.
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 (photosynthesis, germination, flowering, fertilization). Prereq: Biology 2130, 3220 and any Plant and Soil Science course at 3000-level except 3100. 4 hrs.
4710 Principles of Weed Science (4) Principles of cultural, biological, and chemical control of weeds, effects on environment, principles of herbicide selection and activity, types of herbicides and specific recommendations for various crops and non-crop uses. Prereq: Agriculture 1140 or 1210; organic chemistry; 2130 and Plant and Soil Science course at 2000- level except 2100. 3 hrs and 1 lab. Sp
5000 Thesis (1-10) P,F,W
5100 Special Problems in Plant and Soil Science (1-6) May be repeated. Maximum 9 hrs. E
5320 Soil Management (4) Soil management for crop production including crop rotations, cropping systems, tillage systems, use of chemicals and fertilizers, soil testing, and land use. Prereq: 2130; 8 hrs biological sciences. 3 hrs and 1 lab. Sp
5370 Advanced Soil Fertility (3) Concepts of soil fertility and management, soil fertility evaluation and management, soil fertility manipulation. Planning and evaluation of specific soil fertility programs. Prereq: 3220 and 4110 or consent of instructor. F, A
5340 Soil Physics (4) Physical and chemical relations among solid, liquid, and gaseous phases of soil system and their relation to climate, 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. F
5400 Soil Physics (4) Physical and chemical relationships among solid, liquid, and gaseous phases of soil system and their relation to climate, 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
5500 Doctoral Research and Dissertation (3-15) P/A, W, E
5600 Seminar (1) May be repeated. Maximum 3 hrs.
5620 Topics in Crop Breeding and Genetics (1-3) May be repeated with change in subject matter. 1 hr.
5750 Advanced Plant Breeding 1 (4) Concepts and utilization of horticulture, breeding, stability parameters, selection indices, methods of selection, and germplasm resources in breeding program for improvement of plant species. Prereq: 4110 or consent of instructor. 3 hrs and 1 lab. Sp
5850 Mechanisms of Herbicide Action (3) Principles of the uptake, translocation, metabolism and action of herbicides. Effects of herbicides on plant growth factors affecting activity and activity, types of herbicides and specific recommendations for various crops and non-crop uses. Prereq: Biology 2130 or 4110 or consent of instructor. 3 hrs and 1 lab. W
5860 Growth Control with Chemicals (3) Character, structure and activity of plant growth regulating substances with special emphasis on practical aspects of use for control of plant development and effects on yield. Prereq: 4110 or consent of instructor. 3 hrs and 1 lab. Sp
5870 Advanced Crop Physiology (4) Photosynthetic efficiencies in field and relationship with evaporative transpiration; Hardeness development and tolerance for heat stress; drought, cold, flooding. Prerequisites: 5810, 4110 and 2130 or 3100 or 4110. 3 hrs and 1 lab.
5910 Doctoral Research and Dissertation (3-15) P/A, W, E
5920 Topics in Crop Breeding and Genetics (1-3) May be repeated. Course content determined course content. Prerequisites: Genetics, environmental interactions, quantitative genetics, plant breeding, plant physiology, basic genetics and agriculture. 1 hr.
5930 Advanced Plant Breeding 2 (4) Concepts of soil fertility and management, soil fertility evaluation and management, soil fertility manipulation. Planning and evaluation of specific soil fertility programs. Prereq: 3220 and 4110 or consent of instructor. F, A
5940 Advanced Soil Chemistry (3) Structural properties of soil minerals; changes by weathering and biological factors; soil chemical analysis; soil classification; methods and procedures of soil analysis and management. Prereq: 4110 or W
5950 Advanced Soil Chemistry (3) Structural properties of soil minerals; changes by weathering and biological factors; soil chemical analysis; soil classification; methods and procedures of soil analysis and management. Prereq: 4110 or W
5960 Seminar (1) May be repeated. Maximum 3 hrs. E
5970 Advanced Plant Genetics (3) Mutation systems and mechanisms, induced mutations, gene organization, polyplody, tetrasomic inheritance, extrachromosomal inheritance, apomixis, incompatibility and sterility. Prereq: Botany 2100 or consent of instructor. F, A
5972 Quantitative Genetics (2) Genetic constitution of populations and changes; frequency, recognition and measurement of continuous variation; estimation of variable components and genetic advance under different breeding procedures. Prereq: Biology 3100 or equivalent; 3500 or equivalent. W, A
5973 Advanced Plant Breeding (4) Developing breeding programs: historical and theoretical development of concepts of components of variation, heritability, selection intensity, methods of selection, linkage in relation to selection, genotypes by environment interaction, and genic and environmental stability and variance. Prereq: 5740 or concurrent registration in 4710. 3 hrs and 1 lab. W, A
5974 Advanced Crop Physiology and Ecology (4) Quantification of climatic and meteorological factors affecting crop plants; micrometeorological influences on crop growth; world climate, crop distribution and productivity, its relation to crop and individual species and interactions among environmental factors, crop organisms and agricultural systems. Prereq: 4410 or equivalent; 4110 or Botany 4210 or 4310. 3 hrs and 1 lab. F, A
5980 Advanced Crop Physiology (4) Photosynthetic efficiency in field and relationship with evaporative transpiration; Hardeness development and tolerance for heat stress; drought, cold, flooding. Prerequisites: 5810, 4110 and 2130 or 3100 or 4110. 3 hrs and 1 lab.
5980 Advanced Crop Physiology (4) Photosynthetic efficiency in field and relationship with evaporative transpiration; Hardeness development and tolerance for heat stress; drought, cold, flooding. Prerequisites: 5810, 4110 and 2130 or 3100 or 4110. 3 hrs and 1 lab.
5981 Advanced Crop Physiology (4) Photosynthetic efficiency in field and relationship with evaporative transpiration; Hardeness development and tolerance for heat stress; drought, cold, flooding. Prerequisites: 5810, 4110 and 2130 or 3100 or 4110. 3 hrs and 1 lab. W
5990 Doctoral Research and Dissertation (3-15) P/A, W, E
6000 Thesis (1-10) P,F,W
6100 Topics in Soil Sciences (1-3) Student needs and interests determine course content. Evaluation of various factors controlling the properties and functions of soils, soils structure and surface properties, soil microbiology, water movement and use by plants, soil structure, and soil properties; invasive species in the restored or closed environment. Prereq: 4110 or equivalent. W, A
6110 Topics in Plant Breeding and Genetics (1-3) Student needs and interests determine course content. Microevolutionary processes and population genetics, agricultural genetics, molecular genetics, biochemistry, plant breeding, plant physiology, plant genetics, and agro-ecology. Prerequisites: Genetics, environmental interactions, quantitative genetics, plant breeding, plant physiology, basic genetics and agriculture. 1 hr.
6200 Topics in Plant Breeding and Genetics (1-3) Student needs and interests determine course content. Microevolutionary processes and population genetics, agricultural genetics, molecular genetics, biochemistry, plant breeding, plant physiology, plant genetics, and agro-ecology. Prerequisites: Genetics, environmental interactions, quantitative genetics, plant breeding, plant physiology, basic genetics and agriculture. 1 hr.
6220 Topics in Plant Breeding and Genetics (1-3) Student needs and interests determine course content. Microevolutionary processes and population genetics, agricultural genetics, molecular genetics, biochemistry, plant breeding, plant physiology, plant genetics, and agro-ecology. Prerequisites: Genetics, environmental interactions, quantitative genetics, plant breeding, plant physiology, basic genetics and agriculture. 1 hr.
College of Veterinary Medicine

H. Kitchens, Dean
C. F. Reid, Associate Dean
W. H. Blake, Associate Dean

The College of Veterinary Medicine, established in 1974, offers a professional curriculum leading to the degree Doctor of Veterinary Medicine (D.V.M.). The college offers graduate studies leading to the degrees 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 practice 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 companionanimal 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 Service, 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, serum and vaccine production, and the protection of our country against the importation of foreign animal 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 the pharmaceutical companies.

COURSES

Administrative offices of the College of Veterinary Medicine are located in Morgan Hall on the main 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 professional 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:

- **Subjects**
  - Minimum Credits
  - Quarter Semester
  - English, including speech
    - 12 6
  - Humanities
    - 12 6
  - Social Sciences
    - 12 6
  - Mathematics through introductory calculus
    - 9
  - Chemistry: general
    - 12
  - Organic
    - 8
  - Biochemistry
    - 8 4
  - Physics
    - 12 6
  - Biology or zoology
    - 12 6
  - Animal sciences, including nutrition and genetics
    - 13 9

- **Total Credits**: 115 78

**Prerequisites**

- Includes history, nature, evolution, and the origins of various animals, including domestic and wild species.
- Includes psychology, philosophy, anthropological, political science, sociology, and geography.

- Includes veterinary Anatomy and Physiology.

The pre-veterinary requirements may be completed in any accredited college or university which offers courses equivalent to those at The University of Tennessee.

The colleges of Agriculture and Liberal Arts of The University of Tennessee offer a three-year pre-veterinary curriculum which satisfies all the course requirements for admission to the College of Veterinary Medicine. Students who are admitted to the College of Veterinary Medicine following completion of this pre-veterinary curriculum will receive a bachelor's degree upon completion of the first year of the professional veterinary medicine curriculum.

ADMISSION PROCEDURE

Admission of new students will be for the fall quarter of 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 semester of the year in which the student plans to enroll in the College of Veterinary Medicine.

COURSE LOAD

The professional curriculum in veterinary medicine is an 11-academic quarter, year-round program, including summers. The first year (three quarters) consists mostly of pre-clinical subjects such as anatomy, physiology, pharmacology, microbiology, and clinical 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. 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 11-academic quarter, year-round program, including summers. The first year (three quarters) consists mostly of pre-clinical subjects such as anatomy, physiology, pharmacology, microbiology, and clinical 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. The extramural program identified by the student must represent a learning experience not available within The University of Tennessee, Knoxville.

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 first 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.

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Environmental Practice 8612 5
TOTAL: 63 hours

Summer Quarter, SECOND YEAR
Vet. Medicine 8532 3
Vet. Medicine 8536 2
Vet. Medicine 8532 3
Vet. Medicine 8532 3
Vet. Medicine 8620 2
Full Quarter, SECOND YEAR
Vet. Medicine 8530 6
Vet. Medicine 8540 4
Vet. Medicine 8542 5
Vet. Medicine 8535 4
Vet. Medicine 8536 4
Vet. Medicine 8441 1
Water Quarter, SECOND YEAR
Vet. Medicine 8530 5
Vet. Medicine 8531 4
Vet. Medicine 8534 1
Vet. Medicine 8434 1
23 hours
Spring Quarter, SECOND YEAR
Vet. Medicine 8570 9
Vet. Medicine 8572 1
Vet. Medicine 8582 1
Vet. Medicine 8573 3
Vet. Medicine 8572 1
Vet. Medicine 8574 4
Vet. Medicine 8571 3
Vet. Medicine 8434 1
21 hours
TOTAL: 88 hours

THIRD YEAR
Basic Sequence roughly equivalent to
Credit
Block Course-8 weeks
Environmental Practice 8560 2
Pathobiology 8570 7-8 weeks
Radiology 8401 2-weeks
Technology 8700-2 weeks
Animal Practice 8365 4
Urban Practice-5 weeks
Summer 21 hours

Advanced Sequence roughly equivalent
to Winter and Spring
Quarter
Advanced Block-9 weeks
Pathobiology 8700-2 weeks
Radiology 8401 3-weeks
Pathobiology 8700-3 weeks
Technology 8700 2-weeks
Additional 9 weeks

TOTAL: 233 hours

GRADUATE PROGRAM
The College also administers a graduate program involving all departments and lead- ing 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 in other departments.

1 Year 2 to 20 credits of Advanced Sequence training may be awarded for a special number of stemming modern research with converging proposals for special internats or extramural activities.

6235 Advanced Seminar in Animal Science (1-4)
6240 Advanced Seminar in Animal Science (1-4)
5006 Experimental Animal Surgery (4) Competence in performing invasive surgical modifications of experimental animals. Techniques of anesthesia, drug administration, and postoperative care. Prereq: Zoology 4405, 4410, 3860, and, in consultation of instructor, S.

5811-13 Pharmacology (2.5) Molecular basis of drug action in mammalian organs and in specific mammalian cell types; clinical and toxicological applications. Correlated with Animal Science 4610B. Prereq: Consent of instructor and Dean, College of Veterinary Medicine. W.

6000 Doctoral Research and Dissertation (3-15) Pr only. E

6010 Advanced Topics in Environmental Medicine (1-4) Current and future research methodology, laboratory situation, recent advances in instrumentation in analytical techniques for environmental medicine. Prereq. 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. Boyle, Ph.D., Cincinnati; R. G. Courtney, Ph.D., Indiana; Z. C. Monticelli, Ph.D., Cornell; B. J. Rose, Ph.D., University of Bristol (England), Ph.D. University of Queen (Canada). J. M. Woodrow (Emeritus), Ph.D. Kansas; C. J. West, Ph.D., Indiana.

Associate Professors: D. A. Bens, Ph.D., Cornell; J. A. Stief, D.V.M., Ph.D., Michigan State; G. S. Sayer, Ph.D., Michigan State; D. C. Brahms, Ph.D., Illinois; D. C. Sturkie, Ph.D., Michigan State; G. Slavey, Ph.D., Texas—A&M.


PROFESSIONAL COURSES


8175 Advanced Seminar in Pathology (1-4) Diagnostic techniques, electron microscopy, histologic techniques. S, F

GRADUATE COURSES

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

5010 Comparative Pathology (6) Lectures and labs. Pathogenesis, mechanisms, Comparative aspects. Use of pathology in veterinary medicine, food animal surgery, clinical toxicology. Prereq: Consent of instructor. Maximum 20 hrs. E

6000 Doctoral Research and Dissertation (2-5) Pr only. E

6010 Special Topics in Pathology (1-3) Opportunity to design and execute research problems. May be repeated. Maximum 20 hrs. E

6015 Advanced Seminar in Pathobiology (1-4) Diagnostic techniques, immunoprophylaxis, histologic techniques. S, F


8175 Advanced Seminar in Pathology (1-4) Diagnostic techniques, electron microscopy, histologic techniques. S, F

GRADUATE COURSES

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

5010 Comparative Pathology (6) Lectures and labs. Pathogenesis, mechanisms, Comparative aspects. Use of pathology in veterinary medicine, food animal surgery, clinical toxicology. Prereq: Consent of instructor. Maximum 20 hrs. E


8175 Advanced Seminar in Pathobiology (1-4) Diagnostic techniques, electron microscopy, histologic techniques. S, F

8700 Basic Clinical Rotations in Rural Practice (12-16) Introductory clinical training in food animal, small animal, ambulatory and herd health practices. W, Sp.

8710 Veterinary Pathology (5) Causes of disease, parasitology, clinical immunology, clinical bacteriology, clinical virology, microbiology, and clinical toxicology. May be repeated. Maximum 20 hrs. E

8750 Advanced Seminar in Rural Practice (1-4) Basic veterinary medicine, food animal, surgery, clinical toxicology. S, F

GRADUATE COURSES

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

5010 Comparative Pathology (6) Lectures and labs. Pathogenesis, mechanisms, Comparative aspects. Use of pathology in veterinary medicine, food animal surgery, clinical toxicology. Prereq: Consent of instructor. Maximum 20 hrs. E


8175 Advanced Seminar in Pathobiology (1-4) Diagnostic techniques, electron microscopy, histologic techniques. S, F

8700 Basic Clinical Rotations in Rural Practice (12-16) Introductory clinical training in food animal, small animal, ambulatory and herd health practices. W, Sp.

8710 Veterinary Pathology (5) Causes of disease, parasitology, clinical immunology, clinical bacteriology, clinical virology, microbiology, and clinical toxicology. May be repeated. Maximum 20 hrs. E

8750 Advanced Seminar in Rural Practice (1-4) Basic veterinary medicine, food animal, surgery, clinical toxicology. S, F

Graduate Research and Dissertation (3-15) Pr only. E

Urban Practice


PROFESSIONAL COURSES

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

5010 Comparative Pathology (6) Lectures and labs. Pathogenesis, mechanisms, Comparative aspects. Use of pathology in veterinary medicine, food animal surgery, clinical toxicology. Prereq: Consent of instructor. Maximum 20 hrs. E

Veterinary Medicine

PROFESSIONAL COURSES

5010 Client Relations and Communication Skills (1) Interpersonal skills as they apply to client relations and communication with colleagues, employers, general public. 1 lab SINC only. Sp

5110 Introduction to Veterinary Medical Practice (2) Animal species, breed identification, basic care, first aid procedures, anatomic and physiologic structures, signs of disease, intravenous techniques, blood sampling, etc. 1 hr and 1 lab. F

5111 Introduction to Veterinary Medical Practice (2) Physical diagnosis, history taking, and client relations; anatomic principles, agents, and techniques, 1 hr and 1 lab. Sp

5208 Medical Science Interaction Laboratory (5) Multidisciplinary lab, lectures and discussions to provide integrated learning and understanding of physiology, pharmacology and surgical concepts. Aseptic and aseptic techniques and procedures, humane care of animals, introduction to instruments used to measure physiologic recordings. Correlated with 8240, 8250, 8611 and 8612. 2 hrs and 1 lab. F

5340 Introductory System (4) Diseases of integumentary system of animals, with emphasis on diagnostic examination, interpretation of pathologic features, diagnosis and treatment. 3 hrs and 1 lab. F

5341 Histology and Introductory Clinical Pathology (4) Laboratory and clinical approach to diagnosis and treatment of hemostatic system diseases, and principles of methods of laboratory evaluation of diseases from other system courses. 3 hrs and 1 lab. Su

5420 Animal Dietary Treat (6) Physiologic basis, pathology, diagnosis and treatment of diseases of alimentary tract and digestive organs of dogs and cats. F


5436 The Art of Veterinary Medicine (1) Specific diagnostic problems of (paramedical subjects important in) practice whose methods of differential diagnosis, and treatment of certain diseases signs or symptoms, implications for veterinary of medical jurisprudence and ethics, practice economics, veterinary history. May be repeated. SINC only. F, W, Sp

5440 Alimentary Treat I (4) Physiologic basis, pathology, diagnosis and treatment of diseases of alimentary tract and digestive organs of dogs, sheep, goats, ruminants and horses. Su

5500 Reproductive System I (5) Diagnosis, therapy and prevention of conditions causing reduction of the reproductive efficiency of domestic animals. Abnormal conditions of the mammary gland, diagnosis and prevention of mastitis. 4 hrs and 2 labs. F

5531 Urinary System (4) Understanding of urorenal system of animals in health and disease. 3 hrs and 1 lab. W

5532 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

5533 Endocrine, Metabolic and Nutritional Diseases (4) Biochemical and pathophysiologic mechanisms of endocrine, metabolic and nutritional diseases of animals; diagnosis, therapy and prevention. F

5562 Musculoskeletal System I (3) Pathology, diagnosis and management of musculoskeletal diseases of small animals; pathologic changes, interpretation of radiographic and surgical procedures. 4 hrs and 1 lab. W

5563 Musculoskeletal System II (4) Pathology, diagnosis, prognosis, and management of musculoskeletal diseases of large animals. Functional anatomy, radiographic interpretation, surgical procedures and medical therapy applicable to express and non-express. 4 hrs and 1 lab. W

5564 Veterinary Toxicology (5) Molecular mechanisms and clinical features of animal diseases caused by common toxic agents. Su

5565 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. Pr: Consent of Instructor and Director. Comparative and Experimental Medicine Graduate Program. Sp

5571 Advanced Seminar in Urban Practice (1-4) Biochemical and pathophysiology, understanding mechanisms of diseases. May be repeated. SINC only. F, W, Sp

5610 Veterinary Medicine Graduate Program (1) 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. Pr: Consent of Instructor and Director. Comparative and Experimental Medicine Graduate Program. Sp

5620 Medical Science Interaction Laboratory (5) Multidisciplinary lab, lectures and discussions to provide integrated learning and understanding of physiology, pharmacology and surgical concepts. Aseptic and aseptic techniques and procedures, humane care of animals, introduction to instruments used to measure physiologic recordings. Correlated with 8240, 8250, 8611 and 8612. 2 hrs and 1 lab. F

5630 Principles of Medicine (4) Physiologic and pathologic principles underlying mechanisms of diseases. Selected examples of human and animal diseases: pathophysiology, mechanisms and treatment. 2 hrs and 1 lab. F

5631 Normal and Abnormal Structural and Functional Systems (4) Clinical examination, interpretation of pathologic features. 2 hrs and 1 lab. Sp

5632 Comparative Medicine (4) Diagnosis, prevention, and treatment of diseases of laboratory animals, avian species, and marine mammals, seen most commonly by practicing veterinarians. Pr: Consent of Instructor and Director. Comparative and Experimental Medicine Graduate Program. Sp

5633 Principles of Medicine (3) Physiologic and pathologic principles underlying mechanisms of diseases. Selected examples of human and animal diseases, recent scientific advances and effects on veterinary medicine. Sc

5634 Clinical Radiology (3) Training in radiographic techniques and in interpretation of radiographs as part of the diagnostic process. May be repeated. E

5635 Special Medical Services (3) Clinical training in specialty areas such as anesthesiology and orthopedic surgery, with emphasis in both urban and rural animal clinics. Su

5636 Extramural Programs (2-20) Supervised off-campus educational program with an approved institutional rotation. May be repeated. E

5650 Veterinary Toxicology (3) Pharmacologic basis and pathophysiologic features of diseases of animals caused by common toxic chemicals: clinical manifestations, diagnosis, and treatment. Pr: Consent of Instructor and Director. Comparative and Experimental Medicine Graduate Program. Su

5651 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. Pr: Consent of Instructor and Director. Comparative and Experimental Medicine Graduate Program. Su

5721 Comparative Medicine (4) Diagnosis, prevention, and treatment of diseases of laboratory animals, avian species, and marine mammals, seen most commonly by practicing veterinarians. Pr: Consent of Instructor and Director. Comparative and Experimental Medicine Graduate Program. Sp

5725 Principles of Medicine (4) Physiologic and pathologic principles underlying mechanisms of diseases. Selected examples of human and animal diseases: pathophysiology, mechanisms and treatment. 2 hrs and 1 lab. F

5726 Veterinary Toxicology (5) Molecular mechanisms and clinical features of animal diseases caused by common toxic agents. Su

5730 Medical Science Interaction Laboratory (5) Multidisciplinary lab, lectures and discussions to provide integrated learning and understanding of physiology, pharmacology and surgical concepts. Aseptic and aseptic techniques and procedures, humane care of animals, introduction to instruments used to measure physiologic recordings. Correlated with 8240, 8250, 8611 and 8612. 2 hrs and 1 lab. F

5731 Normal and Abnormal Structural and Functional Systems (4) Clinical examination, interpretation of pathologic features. 2 hrs and 1 lab. Sp

5732 Comparative Medicine (4) Diagnosis, prevention, and treatment of diseases of laboratory animals, avian species, and marine mammals, seen most commonly by practicing veterinarians. Pr: Consent of Instructor and Director. Comparative and Experimental Medicine Graduate Program. Sp

5733 Principles of Medicine (3) Physiologic and pathologic principles underlying mechanisms of diseases. Selected examples of human and animal diseases, recent scientific advances and effects on veterinary medicine. Sc

5734 Clinical Radiology (3) Training in radiographic techniques and in interpretation of radiographs as part of the diagnostic process. May be repeated. E

5735 Special Medical Services (3) Clinical training in specialty areas such as anesthesiology and orthopedic surgery, with emphasis in both urban and rural animal clinics. Su

5736 Extramural Programs (2-20) Supervised off-campus educational program with an approved institutional rotation. May be repeated. E

5800 Doctoral Research and Dissertation (3-15) Pr: Consent of Committee. W, Sp


5802 Veterinary Toxicology (3) Pharmacologic basis and pathophysiologic features of diseases of animals caused by common toxic chemicals: clinical manifestations, diagnosis, and treatment. Pr: Consent of Instructor and Director. Comparative and Experimental Medicine Graduate Program. Su
Graduate Programs

The Department of Management Science offers an interdisciplinary program leading to the Master of Science degree. (See page 97.).

The College of Business Administration offers an intercollegiate program leading to the Master of Science and Doctor of Philosophy degrees. (See page 98).

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.

Some students are expected to successfully complete 12 hours per quarter and part-time students 6 hours per quarter, scheduling and sequencing of courses and 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 or at Oak Ridge.

The program consists of the MBA core (twelve to twenty 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 includes from 60 to 84 quarter hours.

Application and Admission: Applications are accepted to begin the full-time program in the summer quarter 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 for 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 completed file 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 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 Test of English as a Foreign Language (TOEFL) for those whose native language is not English, (3) work experience and other activities which demonstrate
Academic Common Market. (See page 36) .

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The remaining elective courses (2 to 4) must be in fields outside the concentration area, normally selected from MBA courses offered in other departments of the College, and may comprise a second concentration area of 4 courses. Up to 2 courses (6 quarter hours) in this block may be taken outside the College of Business Administration. No more than 3 courses numbered below 5050 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 mathematics, 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 under-graduate equivalent work) are:

Accounting 5010, 5020, 5030; Business Administration 5310; Business Law 5010; Economics 5010, 5020, 5030; Finance 5010, 5020; Management 5010, 5020; Management Science 5010, 5020; Mathematics 5011, 5032; Office Administration 5010, 5020; Transportation and Logistics 5032.

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

Accounting
Economics
Finance
Health Care Management
Management Science
Marketing
Statistics
Transportation and Logistics.

Requests for changes in concentration areas early in the program is encouraged to facilitate proper course sequencing. Students withdrawn from the program approved by the Office of Graduate Business Programs.

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

Accounting
Economics
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Health Care Management
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Accounting
Economics
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Health Care Management
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Among the 8 courses in the concentration/electives block, at least 4 and not more than 6 must be in one of the following concentration areas for specific courses required in some concentration areas, see departmental sections and the following pages:

Accounting
Economics
Finance
Health Care Management
Management Science
Marketing
Statistics
Transportation and Logistics.

Requests for changes in concentration areas early in the program is encouraged to facilitate proper course sequencing. Students withdrawn from the program approved by the Office of Graduate Business Programs.
The Tennessee DBA program is highly structured, offering minimal flexibility in degree requirements. Students are encouraged to maximize the integrative facets of the dual program by taking courses in both colleges each quarter. Awarding of Grades: In the College of Law, for grade recording purposes for graduate business courses and in the College of Business Administration for law school courses, grades awarded will be converted to either Satisfactory or No Credit and will not be included in the computation of the student’s grade average or class standing in the core where such grades are so converted. The College of Law will award a grade of Satisfactory for a graduate business course in which the student has earned a B grade or higher and a No Credit for any lower grade. The College of Business Administration will award a grade of Satisfactory for a Law School course in which the student has earned a 2.3 grade or higher and a No Credit for any lower grade. Grades earned in courses of either college may be used on a regular basis for any appropriate purpose in the colleges offering the course.

THE DBA PROGRAM

The primary objective of the Doctor of Business Administration (DBA) degree is to prepare a select number of qualified students for careers in university-level teaching and research, and for responsible positions in business and government. Students seeking a DBA degree must be recommended for acceptance by the College of Business Administration to The Graduate School. Actual acceptance is contingent upon the applicant’s overall standing compared with other applicants, and may include the recommendation of vacancies in each department. The college requires the DBA application, scores from the GMAT, and 4 recommendations. All materials must be received by the College of Business Administration no later than March 1 of each year. Later applications are considered only if space is available.

Program of Study: The DBA normally requires at least three years of intensive study and research beyond the MBA degree. Typically, the first two years of a student’s program consist of coursework, writing and research. The third year usually focuses on completion of the dissertation research and writing. The Doctor of Business Administration program of study is structured for full-time students only. Upon acceptance of a student by a particular departmental faculty, the student is expected to remain in residence until the dissertation has been completed and all requirements are met for completion of the DBA degree.

Since the program focuses on the development of competent scholars, heavy emphasis is placed on both teaching and research skills. As part of the doctoral program, each student is required to serve as a teaching assistant to an undergraduate business class, or as a research assistant to a senior faculty member. Typically, the College of Business Administration offers financial support for doctoral students during their tenure in the program.

The Tennessee DBA program is highly flexible, offering a range of options and elective courses. Moreover, heavy emphasis is placed on close student-faculty interaction and diverse 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:

1. Accounting
2. Finance
3. Management
4. 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 their 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:

1. Students must complete at least three years of full-time coursework beyond the baccalaureate degree, with two years of residence on the Knoxville campus.
2. Students must complete appropriate courses at the graduate level, or other approved concentrations of coursework, in the following areas:
   - Accounting
   - Finance
   - Behavioral Science
   - Legal Environment
   - Business Policy
   - Management
   - Computer Science
   - Statistics
   - Economics
   - At work in the above areas is subject to approval by the temporary Doctoral Advisory Committee and the Associate Dean for Graduate Business Programs. Specific major area concentrations are not listed above.
3. Economics 5110-20 (or equivalent) is required, except that Management 5610-20 (or equivalent) may be substituted with prior approval.
4. At least 15 quarter hours of graduate research methods must be completed. At least 6 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 5505) courses or in other areas such as research methodology, management science, computer science, economics, and programming.
5. 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 are required, including at least 9 hours of doctoral seminars.
6. A minimum of 12 quarter hours of graduate 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: All doctoral students must complete comprehensive written examinations over the major and collateral areas required of each person seeking candidacy for the DBA degree. The major and collateral examinations are 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. Scheduled and scheduling of comprehensive examinations is coordinated through the Office of Graduate Business Programs.

When either the major or collateral area examination is passed, the remaining 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 examining at least a 3.0 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 special attention to the composition of the preliminary doctoral committee. A student and the major professor identify a second faculty member and at least four faculty members, three of whom, including the major professor, must belong to the graduate college where such grades are so completed. The application for admission to candidacy must be approved by the temporary doctoral advisory committee. The application must include a listing of all courses taken in the field of study in the previous academic year and a research proposal for the dissertation. The application also must include a listing of all courses taken in the field of study in the previous academic year and a research proposal for the dissertation. The application also must include an indication of the expected time to complete the dissertation with a candidate’s doctoral committee, the Associate Dean for Graduate Business Programs, and the Graduate Council before submission to the Graduate School.

Dissertation minimum of 36 quarter hours. The dissertation must be a dissertation embodying the results of original research by the student and scholarly writing. The dissertation is supervised by a doctoral committee, which must certify its completion and acceptance. The dissertation must be approved by the student’s doctoral committee and the Associate Dean for Graduate Business Programs before submission to The Graduate School.
graduates 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 37.

MINIMUM ACADEMIC PERFORMANCE STANDARDS
A graduate student in the College of Business Administration whose grade point average at any point is below 3.0 will be placed on probation. A student on probation will be dropped from the program unless his/her cumulative grade point average is 3.0 or higher at the end of the probationary period. The probationary period is defined as the next 12 quarter hours of course work attempted which is specified in the student's degree program. Full-time students must take two courses per quarter while on probation and part-time students must take eight hours per quarter for each consecutive four-quarter period. Exceptions to this policy may be made only with the approval of the Associate Dean for Graduate Programs 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 must supply results of either the GMAT or the Graduate Record Examination (GRE) as part of their application for management science and statistics programs. Programs 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). Scheduled dates and locations for taking these examinations may be obtained from Educational Testing Service, P.O. Box 996, Princeton, New Jersey 08540, and from most colleges and universities.

Adjunct Professor has extensive experience in the field. The faculty for the TEDP consist of senior professors who teach business-related subjects in the University's graduate programs and nationally recognized professors of other institutions. Each participating faculty member has extensive experience in either consultation with or actual operation and other 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 tuition as well as a 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 forms of information and supports the College in seeking funding for research projects. Staff members conduct research in regional economics, public finance, and economics policy related to social and economic issues 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 "Tennessee Survey of Business." The Center is a member of the Association for University Business and Economic Research.

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

The four-week Tennessee Executive Development Program (TEDP) is designed to provide executive 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 participants to work cooperatively 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 the 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 live on 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 of other institutions. Each participating faculty member has extensive experience in either consultation with or actual operation and other 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 tuition as well as a 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.

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ability of success in a career in professional accounting. Moreover, the student's educa-
tional experience should develop perspective toward the discipline of accounting in a
manner that will enable the student to spearhead innovation and change in response to
needs in public accounting, busi-
ness, industry or government.
Foundation Requirement: Although the program is designed for students who have
completed an accredited baccalaureate
degree program with a major in Accounting, those with outstanding undergraduate
records in any area may earn the M.Acc.
degree by completing prerequisites in
accounting and by including courses in other
business and related disciplines to supple-
ment the applicant's undergraduate
background.
Course Requirements for the M.Acc. Pro-
gram: A student program encompas-
ses a minimum of 45 quarter hours of
course work. Specifically, the student must
complete 6 quarter hours of graduate busi-
dness and in the area of accounting as indic-
ated below. Each course is 3 quarter hours of graduate credit.

Business Core (21 quarter hours): Eco-
nomics 5030, Finance 5420, Mathematics
5952 and 4 addition courses from the pro-
gram advisor (no more than one course may
be taken in any one area): Business Policy, Business Law, Computer Science, Econom-
ics, Management, Management Science,
Marketing, Finance, Statistics, and Trans-
portation.
Accounting Core (15 quarter hours): Accounting 5110, 5120, 5210, 5420, 5950.
Accounting Electives (select 12 quarter hours): Accounting 5140, 5160, 5290, 5430, 5450, 5460, 5480, 5510, 5540, 5580.
Other Requirements: To qualify for the degree, the student must have a B average
(3.0) in the business core courses and also a B average (3.0) in the accounting core courses. Each student must pass a final written examination during the final quarter of study for the degree.

MBA Concentration: Accounting
MBA Concentration: Accounting
Minimum Course Requirements for MBA Concentration: Accounting 5110, 5120, 5210, 5420, and the following of two: 5320, 5330, 5360, 5365

All Master of Business Administration stu-
dents are expected to complete Accounting. Other Accounting are required to take a minimum of 6 quarter hours of graduate busi-
dness and in the area of accounting as indic-
ated 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
subsequently enrolled in the same course
with credit for 4130 or equivalent.

Required for the non-thesis student not otherwise
Required for the non-thesis student not otherwise
recommended by the program advisor. Students who
have completed an accredited baccalaureate
degree program with a major in Accounting, those with outstanding undergraduate
records in any area may earn the M.Acc.
degree by completing prerequisites in
accounting and by including courses in other
business and related disciplines to supple-
ment the applicant's undergraduate
background.
Course Requirements for the M.Acc. Pro-
gram: A student program encompas-
ses a minimum of 45 quarter hours of
course work. Specifically, the student must
complete 6 quarter hours of graduate busi-
dness and in the area of accounting as indic-
ated below. Each course is 3 quarter hours of graduate credit.

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nomics 5030, Finance 5420, Mathematics
5952 and 4 addition courses from the pro-
gram advisor (no more than one course may
be taken in any one area): Business Policy, Business Law, Computer Science, Econom-
ics, Management, Management Science,
Marketing, Finance, Statistics, and Trans-
portation.
Accounting Core (15 quarter hours): Accounting 5110, 5120, 5210, 5420, 5950.
Accounting Electives (select 12 quarter hours): Accounting 5140, 5160, 5290, 5430, 5450, 5460, 5480, 5510, 5540, 5580.
Other Requirements: To qualify for the degree, the student must have a B average
(3.0) in the business core courses and also a B average (3.0) in the accounting core courses. Each student must pass a final written examination during the final quarter of study for the degree.

MBA Concentration: Accounting
MBA Concentration: Accounting
Minimum Course Requirements for MBA Concentration: Accounting 5110, 5120, 5210, 5420, and the following of two: 5320, 5330, 5360, 5365

All Master of Business Administration stu-
dents are expected to complete Accounting. Other Accounting are required to take a minimum of 6 quarter hours of graduate busi-
dness and in the area of accounting as indic-
ated 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
subsequently enrolled in the same course
with credit for 4130 or equivalent.

Required for the non-thesis student not otherwise
Required for the non-thesis student not otherwise
recommended by the program advisor. Students who
have completed an accredited baccalaureate
degree program with a major in Accounting, those with outstanding undergraduate
records in any area may earn the M.Acc.
degree by completing prerequisites in
accounting and by including courses in other
business and related disciplines to supple-
ment the applicant's undergraduate
background.
Course Requirements for the M.Acc. Pro-
gram: A student program encompas-
ses a minimum of 45 quarter hours of
course work. Specifically, the student must
complete 6 quarter hours of graduate busi-
dness and in the area of accounting as indic-
ated below. Each course is 3 quarter hours of graduate credit.

Business Core (21 quarter hours): Eco-
nomics 5030, Finance 5420, Mathematics
5952 and 4 addition courses from the pro-
gram advisor (no more than one course may
be taken in any one area): Business Policy, Business Law, Computer Science, Econom-
ics, Management, Management Science,
Marketing, Finance, Statistics, and Trans-
portation.
Accounting Core (15 quarter hours): Accounting 5110, 5120, 5210, 5420, 5950.
Accounting Electives (select 12 quarter hours): Accounting 5140, 5160, 5290, 5430, 5450, 5460, 5480, 5510, 5540, 5580.
Other Requirements: To qualify for the degree, the student must have a B average
(3.0) in the business core courses and also a B average (3.0) in the accounting core courses. Each student must pass a final written examination during the final quarter of study for the degree.

MBA Concentration: Accounting
MBA Concentration: Accounting
Minimum Course Requirements for MBA Concentration: Accounting 5110, 5120, 5210, 5420, and the following of two: 5320, 5330, 5360, 5365

All Master of Business Administration stu-
dents are expected to complete Accounting. Other Accounting are required to take a minimum of 6 quarter hours of graduate busi-
dness and in the area of accounting as indic-
ated 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
subsequently enrolled in the same course
with credit for 4130 or equivalent.

Required for the non-thesis student not otherwise
Required for the non-thesis student not otherwise
recommended by the program advisor. Students who
have completed an accredited baccalaureate
degree program with a major in Accounting, those with outstanding undergraduate
records in any area may earn the M.Acc.
degree by completing prerequisites in
accounting and by including courses in other
business and related disciplines to supple-
ment the applicant's undergraduate
background.
Course Requirements for the M.Acc. Pro-
gram: A student program encompas-
ses a minimum of 45 quarter hours of
course work. Specifically, the student must
complete 6 quarter hours of graduate busi-
dness and in the area of accounting as indic-
ated below. Each course is 3 quarter hours of graduate credit.

Business Core (21 quarter hours): Eco-
nomics 5030, Finance 5420, Mathematics
5952 and 4 addition courses from the pro-
gram advisor (no more than one course may
be taken in any one area): Business Policy, Business Law, Computer Science, Econom-
ics, Management, Management Science,
Marketing, Finance, Statistics, and Trans-
portation.
Accounting Core (15 quarter hours): Accounting 5110, 5120, 5210, 5420, 5950.
Accounting Electives (select 12 quarter hours): Accounting 5140, 5160, 5290, 5430, 5450, 5460, 5480, 5510, 5540, 5580.
Other Requirements: To qualify for the degree, the student must have a B average
(3.0) in the business core courses and also a B average (3.0) in the accounting core courses. Each student must pass a final written examination during the final quarter of study for the degree.

MBA Concentration: Accounting
MBA Concentration: Accounting
Minimum Course Requirements for MBA Concentration: Accounting 5110, 5120, 5210, 5420, and the following of two: 5320, 5330, 5360, 5365

All Master of Business Administration stu-
dents are expected to complete Accounting. Other Accounting are required to take a minimum of 6 quarter hours of graduate busi-
dness and in the area of accounting as indic-
ated 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
subsequently enrolled in the same course
with credit for 4130 or equivalent.
Business Administration

MAJOR DEGREES

Business Administration
MBA, DBA

5050 Data Processing in Business (3) Fundamentals of computer operations and applications, systems design, F, Sp

5310 Business Policy (3) Case studies covering policy formulation and implementation. Point of departure—top and middle management, where counterpart policies are set and departmental policies and activities are coordinated; sizing up company's situation, continuous administrative reappraisals. Enrollment priority given MBA students, 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 environment of plants and activities in business firms with environmental factors. Prereq: Consent of instructor. E

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

Business Education

See College of Education

MAJOR DEGREES

Economics
M.A., Ph.D.

Professors: W. E. Clark (head), Ph.D. Texas; F. A. Bohm, Ph.D. Washington (St. Louis); J. E. Blevins, Ph.D. Texas; D. L. Blomberg, Ph.D. Michigan; J. C. Brown, Ph.D. Michigan; R. H. Fulkerson, Ph.D. Michigan State; G. R. Feiweli, Ph.D. McGill; W. W. Fox, Ph.D. Michigan State; E. P. Phillips, Ph.D. Stanford; C. B. Garrison, Ph.D. Harvard; H. S. Hofter, Ph.D. North Carolina; J. W. Thompson, Ph.D. Washington (Seattle); A. G. M. Neale, Ph.D. Texas; J. F. Hooby (internship), Ph.D. Michigan State; G. M. Moore, Ph.D. Cornell; W. C. Mayfield, Ph.D. Texas; G. A. Spiva, Ph.D. Texas; F. E. Glustoff, Ph.D. Michigan State; M. G. Schwartz, Ph.D. California; W. L. Mayo, Ph.D. Washington (Seattle); M. A. Schommer, Ph.D. Washington (Portland); D. J. Wood, Ph.D. Missouri.

*Alumni Designated Service Professor

The Department of Economics offers graduate programs leading to the M.A. and Ph.D. degrees. The M.A. degree may be completed by either a thesis or non-thesis option, while the Ph.D. degree requires successful completion of a dissertation. Applications to these programs should be directed to the Director of Graduate Studies, Department of Economics for further information. The Department also offers an area of concentration for the MBA degree. Students interested in the MBA program should contact the Associate Dean for Graduate Programs, College of Business Administration.

THE MASTER'S PROGRAM

Admission to the M.A. program is based on undergraduate academic performance and on scores from the general portion of the GRE or GMAT. The degree requires a minimum of 45 quarter hours. The non-thesis option requires Economics 5111-12 and 5121-22 and an additional 18 hours of course work at the 5000 level or above, with 9 hours to be concentrated in one field of economics. Students selecting the non-thesis option will be required to pass a final written comprehensive examination. The thesis option requires Economics 5111-12 and 5121-22 and an additional 9 hours of course work at the 5000 level or above. In the thesis option, the thesis gives 9 hours of requirements. The requirements for a graduate minor in economics are as follows: Economics 5112 or 5122 or 5132, or (2) 5110 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

Admission to the Ph.D. program is based on promises of outstanding scholarship, as demonstrated by previous academic performance and by scores achieved on the general portion of the GRE or GMAT. Requirements for successful completion of the program consist of the four components listed below.

1. Students are required to complete the following core requirements:
   Admission to the Ph.D. by comprehensive examination or by completion of Economics 5111-22; or 5121-22 with a B average or higher, supervised by a Ph.D. student, and student's work in Economics 5250 and 5260. The Ph.D. in economics requires a minimum of 60 quarter hours of graduate credit. The core requirement for the Ph.D. is Economics 5111-22 and 5121-22 with a B average or higher, supervised by a Ph.D. student, and student's work in Economics 5250 and 5260.

2. Students are required to take at least 18 quarter hours of advanced graduate economics courses at the 5000 level or above, outside the core subject areas and the two fields of application.

3. Students are required to take at least two elective economics courses at the 5000 level or above, outside the core subject areas and the two fields of application.

4. Successful completion of the dissertation, including an oral defense, to give at least 36 hours of graduate credit (6000). M.A. and 5111-12Microeconomic TheoryI,II (3,3) Theory of the firm, the labor market, and optimizing techniques. Prereq: 5010 or college algebra equivalent. P/N only. E

5. Students are required to complete the dissertation, including an oral defense, to give at least 36 hours of graduate credit (6000). M.A. and 5111-12Microeconomic TheoryI,II (3,3) Theory of the firm, the labor market, and optimizing techniques. Prereq: 5010 or college algebra equivalent. P/N only. E

5000 Special Topics (3) Student generated courses offered at convenience of department and upon student initiative. Subject matter and contents determined by students and instructor with approval of the department.

5030 Thesis (1-15) P/N only. E

5300 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 resources. Degree is considered to be not toward degree requirements. May be repeated. Maximum 9 yrs. E

5911-30 Problems in Law of Thesis (3, 5, 8) UNC only.

5990 Workshop in Economics (1-5) Special topics in economic education. Not for credit in any College of Business Administration degree program. Course content and form shall be determined by instructor. May be repeated. Maximum 9 yrs.

5995-30 Economics Seminar (1, 1, 1) Research program in area of concentration. May be repeated. S/N only. E

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

ECONOMIC THEORY

4130 Business Cycles (3) Fluctuations in income, employment, prices, and output in the economic system. Analysis of the historical facts surrounding business fluctuations and of the theoretical facts concerning booms and depressions, statistical methods for analyzing business fluctuations, theoretical explorations of cycles, and policies that have been proposed to combat them. Prereq: 5120 or consent of instructor. Sp

4150 History of Economic Thought (3) Development of economic thought, theories, tools of analysis, and economic concepts with emphasis on the economic thought of the 18th century. May be repeated. Prereq: Consent of instructor. Fall

4170-00 Introduction to Mathematical Economics (3) Fundamental knowledge, concepts, and techniques for the study of economic phenomena, and an appreciation of the historical facts concerning booms and depressions, statistical methods for analyzing business fluctuations, theoretical explorations of cycles, and policies that have been proposed to combat them. May be repeated. Prereq: Consent of instructor. F, Sp

5010 Introduction to Economic Analysis (3) Analytical methods with applications to economic problems. Not available for students with credit for 5101. P/N only. Prereq: Algebra and 5020.

5030 Managerial Economics (3) Application of economic concepts to business decision making. Analysis and forecasting of demand, supply analysis, profit maximization, and cost minimization. Prereq: 5110 and college algebra equivalent. P or NP only. Prereq: Consent of instructor. Fall


5110 Fundamentals of Microeconomics (2) An introduction to microeconomic principles and microeconomic theories for students without prior training in economics. P: Knowledge of high school algebra equivalent. Prereq: 5011 or equivalent. F, Sp, Su

5111-12 Microeconomic Theory I, II (3, 3) Theory of consumer choice and demand, theory of the firm; theory of production and cost, market structures, derived demand and factor pricing, introduction to welfare economics, capital theory. Should be taken in consecutive quarters. Prereq: 5110 or equivalent. F, W


5121. Prereq: 3110 or equivalent. W

5120 Fundamentals of Macroeconomics (3) Determination of levels of employment and prices for economy as a whole; relationships between interest rates, price expectations, productivity, and quantity of money. Consumption, investment, savings, and aggregate demand and supply; inflation, unemployment. Prereq: 3100 or equivalent. F

5211-22 Macroeconomic Theory I, II (3, 3) Monetar- y and income-expenditure equations to analysis of income and price level determination; applications to contemporary macroeconomic problems. Should be taken by students who are majoring or concentrating in business. Prereq: 3100 or equivalent. W, Sp

5160 History of Economic Thought (3) Development of economic ideas from mercantilism through Alfred Marshall, emphasis given to classical and neoclassical tradition.


5180 Qualitative Methods in Economics (4) Ele- mentary economic concepts and techniques. Review of statistical inference, linear regression model, estimation, hypothesis testing, generalized linear square, distributed lags, and simultaneous equations. Appli- cations of these concepts to economic problems. Prereq: introductory statistics or 5211 or equiva- lent. Sp

5220 Introduction to Econometrics (3) Statistical demand analysis, production and cost analysis, dis- tribution of income and wealth, models of growth and consumption, international trade, and national saving; taken by students who are concentrating taking Econ- omics 5170-40, 55.

5280 Financial Markets and Intermediaries (3) Prereq: Finance 5160. W

5300 Commercial Banking (3) Prereq: Finance 5030. Sp

5111 Advanced Microeconomic Theory (3) Consum- er and producer behavior, production, and exchange in partial and general equilibrium settings. Prereq: 4710, 4810, 5112, or equivalent. F

5112 Advanced Macroeconomic Theory (3) Topics in macroeconomic theory and policy. Prereq: 5110 or equivalent. W

5150-60 History of Economic Decrees (3, 3) Impor- tant economic decrees from Middle Ages in present. W, Sp

6170-80-90 Economic Theory (3, 3, 3) Theory and techniques of statistical testing of economic hypoth- eses; general equilibrium, input-output, and computer models. Review of classical least squares regression model and its applications; use of computer models with application to current economic research. Prereq: 1580-90 and 5510 or equivalent. F, W, Sp, Su

6121 Advanced Macroeconomic Theory (3) Topics in macroeconomic theory and policy. Prereq: 5120 or equivalent. W

6510-20 Seminar: Monetary Theory (3, 3) Study of effect of monetary policy on economic activity. Prereq: 5020 or equivalent. W

6350-60 Seminar in Industrial Organization and Public Finance (3, 3) Industrial organization and operation of public sector. F, W

5610-20 Seminar in Economic History (3, 3) Historical and social problems of economic development from the College of Business Administration/Economics 43
Finance

Professors:
- W. R. Goodstein (Chairman), Ph.D., Pennsylvania State; F. L. Anderson, Ph.D., Wisconsin; W. S.C. Vance' (Emeritus), Ph.D., Pennsylvania State; D. W. Klinefelter, Ph.D., Oregon; E. W. Lambert, Jr., (on leave), Ph.D., Pennsylvania State; F. W. Newby; R. E. Subenheim, Ph.D., California Institute of Technology; C. F. Winkler, Emeritus, Ph.D., Pennsylvania State.

Associate Professors:
- A. L. Auster, Ph.D., Iowa; F. T. Brainerd, Ph.D., Washington; D. Chase, Ph.D., Pennsylvania State; J. M. McPeek, Jr., Ph.D., Illinois (Chicago-Urbana); C. P. L. H. Beach, Ph.D., Pennsylvania State.

Assistant Professors:
- R. C. Clayton, Ph.D., George; M. C. Etherton, Ph.D., George; T. G. Schmitz, Ph.D., North Carolina.

*Win. Vorg., Professor of Insurance.
+Mounts National Bank Professor of Finance
#Longview Chancellor

MBA Concentration: Finance. The curriculum offers courses for those interested in careers in corporate financial management, security analysis and investments, banking and financial institutions, real estate investment, and financial institutions, and financial planning and services.

DBA Concentration: Finance

Minimum Course Requirements for MBA Concentration: At least four and not more than six courses from the following: 5400, 5410, 5440, 5450, 5510, 5610, 5620, 5630, 5810, 5820, and 5990.

6110 Business and Public Risk Management (3) Identification and measurement of pure risks facing business or governmental unit associated with property, liability and personal exposures. Implementation of basic risk management techniques. Prerequisites: 5010 (with a C or higher), 5450, 5480 or equivalent. Maximum 6 hrs.

5210 Personnel Management (3) Analysis and appraisal of the personnel function. Prerequisites: 5170, 5410, 5480 or consent of instructor. Maximum 6 hrs.

5310 Probabilities in Financial Management (3) Application of decision-making techniques to problems in financial management. Procedures of valuation, risk, and expected return. Available for graduate students in the Master of Science degree program in finance only. Prerequisite: 5010 or 5010, or consent of instructor. Maximum 6 hrs.

5410 Financial Strategy (3) Effects of financial strategy on shareholder wealth; integration and interaction of financing and investment decisions. Implications of corporate life style for its operational policies. Prerequisites: 5010 or 5010, 5020 or equivalent. Maximum 6 hrs.

5420 Analysis and Management of Risk (3) Development of decision and risk-taking models that incorporate risk and uncertainty into competitive, project, and capital market decision-making processes. Prerequisite: 5420 or consent of instructor. Maximum 6 hrs.

5430 Portfolio Analysis and Management (3) Development and practical application of concepts and methods used in selection, management, and evaluation of financial assets and liabilities. Prerequisite: 5420 or consent of instructor. Maximum 6 hrs.

5450 Financial Analysis of Complex Issues: In International Finance (3) Analysis of international financial aspects of the management of multinational firms. Integration of international financial, economic, and political factors, analysis of risk, and capital allocation. Prerequisites: 5420 or consent of instructor. Maximum 6 hrs.

5460 Financial Management of Risk (3) Value of financial analysis, and investment in income-producing property. Tax aspects of acquisition, operations, and sales. Syndication and fundraising methods. Prerequisite: 5100 or consent of instructor. Maximum 6 hrs.

5480 Economic Analysis of Housing and Urban Land Markets (3) Introduction to public policy, neighborhood transition and federal housing policy. Difficulties in obtaining efficient and equitable solutions to various aspects of urban problems. Relevance of empirical and theoretical economics literature to policy makers and entrepreneurs. Prerequisite: Economics 5220 or consent of instructor. Maximum 6 hrs.

5490 Real Estate Investment Analysis (3) Application of contemporary appraisal and feasibility analysis to real estate case studies. Real estate investment, market analysis, and decision-making. Prerequisite: 5100 or consent of instructor. Maximum 6 hrs.

5510 Advanced Seminar in Financial Decisions (3) Analysis of international financial aspects of the management of multinational firms. Integration of international financial, economic, and political factors, analysis of risk, and capital allocation. Prerequisites: 5420 or consent of instructor. Maximum 6 hrs.

5520 Advanced Seminar in Capital Markets (3) Recent developments in journal literature: informational asymmetry, related party transactions, and information technologies. Prerequisite: 5510 or consent of instructor. Maximum 6 hrs.

5580 Business and Public Risk Management (3) Identification and measurement of pure risks facing business or governmental unit associated with property, liability and personal exposures. Implementation of basic risk management techniques. Prerequisites: 5010 (with a C or higher), 5450, 5480 or equivalent. Maximum 6 hrs.

5600 Doctoral Research and Dissertation (3-15) P/N only. E

5990 Research in Finance (3) Directed research on a finance topic of mutual interest to student and staff member. May be repeated. Maximum 6 hrs.

5140 Financial Strategy (3) Effects of financial strategy on shareholder wealth; integration and interaction of financing and investment decisions. Implications of corporate life style for its operational policies. Prerequisites: 5010 or 5010, or consent of instructor. Maximum 6 hrs.

5170-80-90 Quantitative Analysis of Psychology (3, 3, 3) Introduction to basic concepts and research tools applicable to problems in psychology. Must be taken in sequence during the student's first year. Prerequisite: Psychology 5170-80-90. (F, W, Sp.)

5301 Probabilities in Financial Management (3) Application of decision-making techniques to problems in financial management. Procedures of valuation, risk, and expected return. Available for graduate students in the Master of Science degree program in finance only. Prerequisite: 5010, 5020 or equivalent. Maximum 6 hrs.

5310 Probabilities in Financial Management (3) Application of decision-making techniques to problems in financial management. Procedures of valuation, risk, and expected return. Available for graduate students in the Master of Science degree program in finance only. Prerequisite: 5010, 5020 or equivalent. Maximum 6 hrs.

5320 Investment Analysis (3) Principles and techniques for evaluation of investment desirability of various financial instruments. Prerequisites: 5010 or 5010, 5020 or equivalent. Maximum 6 hrs.

5330 Investment Analysis (3) Principles and techniques for evaluation of investment desirability of various financial instruments. Prerequisites: 5010 or 5010, 5020 or equivalent. Maximum 6 hrs.

5420 Analysis and Management of Risk (3) Development and practical application of concepts and methods used in selection, management, and evaluation of financial assets and liabilities. Prerequisites: 5420 or consent of instructor. Maximum 6 hrs.

5450 Financial Analysis of Complex Issues: In International Finance (3) Analysis of international financial aspects of the management of multinational firms. Integration of international financial, economic, and political factors, analysis of risk, and capital allocation. Prerequisites: 5420 or consent of instructor. Maximum 6 hrs.

5460 Financial Management of Risk (3) Value of financial analysis, and investment in income-producing property. Tax aspects of acquisition, operations, and sales. Syndication and fundraising methods. Prerequisite: 5100 or consent of instructor. Maximum 6 hrs.

5480 Economic Analysis of Housing and Urban Land Markets (3) Introduction to public policy, neighborhood transition and federal housing policy. Difficulties in obtaining efficient and equitable solutions to various aspects of urban problems. Relevance of empirical and theoretical economics literature to policy makers and entrepreneurs. Prerequisite: Economics 5220 or consent of instructor. Maximum 6 hrs.

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5510 Advanced Seminar in Financial Decisions (3) Analysis of international financial aspects of the management of multinational firms. Integration of international financial, economic, and political factors, analysis of risk, and capital allocation. Prerequisites: 5420 or consent of instructor. Maximum 6 hrs.

5520 Advanced Seminar in Capital Markets (3) Recent developments in journal literature: informational asymmetry, related party transactions, and information technologies. Prerequisite: 5510 or consent of instructor. Maximum 6 hrs.

5580 Business and Public Risk Management (3) Identification and measurement of pure risks facing business or governmental unit associated with property, liability and personal exposures. Implementation of basic risk management techniques. Prerequisites: 5010 (with a C or higher), 5450, 5480 or equivalent. Maximum 6 hrs.

5600 Doctoral Research and Dissertation (3-15) P/N only. E

5990 Research in Finance (3) Directed research on a finance topic of mutual interest to student and staff member. May be repeated. Maximum 6 hrs.

5140 Financial Strategy (3) Effects of financial strategy on shareholder wealth; integration and interaction of financing and investment decisions. Implications of corporate life style for its operational policies. Prerequisites: 5010 or 5010, or consent of instructor. Maximum 6 hrs.

5170-80-90 Quantitative Analysis of Psychology (3, 3, 3) Introduction to basic concepts and research tools applicable to problems in psychology. Must be taken in sequence during the student's first year. Prerequisite: Psychology 5170-80-90. (F, W, Sp.)

5301 Probabilities in Financial Management (3) Application of decision-making techniques to problems in financial management. Procedures of valuation, risk, and expected return. Available for graduate students in the Master of Science degree program in finance only. Prerequisite: 5010, 5020 or equivalent. Maximum 6 hrs.

5310 Probabilities in Financial Management (3) Application of decision-making techniques to problems in financial management. Procedures of valuation, risk, and expected return. Available for graduate students in the Master of Science degree program in finance only. Prerequisite: 5010, 5020 or equivalent. Maximum 6 hrs.
Management Science

MAJOR

Management Science
Ph.D.

Associate Professors: J. K. Hsu, Ph.D.; Leverett, Ph.D.; Georgia Institute of Technology.

Management Science Committee: Members of the Management Science faculty and in addition: J. E. Brestel, Mathematics; C. G. Pickering, Economics; C. G. Hug, Statistics; C. G. Jolley, 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 5610, and with approval of student's advisor, substitute Statistics 5120 for 5000. The concentration area must include Management Science 5330 and 5340.

MAJOR

Management Science 5310-20-30 Management Science Methods (3,3,3) Master of Science in Management Science. The program includes approximately 24 to 28 quarter hours of course work, normally is completed by the end of the first year of the program. There is no foreign language requirement. Comprehensive Examination: Prior to admission to candidacy for the degree, and no later than 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 deems appropriate. This effort, which is beyond the minimum 72 hours of course work, normally is completed in the third year of the program.

Requirements for Management Science Courser: The Management Science Program is interdisciplinary and students in other degree programs are encouraged to enroll in management science courses.

Course prerequisites are designed to allow the student to complete 36 quarter hours of course work. Students who do not take the prerequisite courses must be prepared to do so. These requirements are designed to provide for the science. The final oral examination is conducted over the dissertation and such other segments of the program that the faculty committee deems appropriate. This effort, which is beyond the minimum 72 hours of course work, normally is completed in the third year of the program.

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Course prerequisites are designed to allow the student to complete 36 quarter hours of course work. Students who do not take the prerequisite courses must be prepared to do so. These requirements are designed to provide for the science. The final oral examination is conducted over the dissertation and such other segments of the program that the faculty committee deems appropriate. This effort, which is beyond the minimum 72 hours of course work, normally is completed in the third year of the program.
6110-30 Models for Production Systems (3, 3) Seminar providing research experience in professional development of doctoral students. Investigation of existing mathematical models for production processes and opportunities for original research. Prereq: 5310 or equivalent.

6120-30 Network Flows (3, 3) In-depth treatment of widely applied network optimization algorithms including transportation and transshipment, primal and primal-dual base-tree methods, max/minimum, min/max, and dynamic flows; flow with gains, and other advanced topics. Prereq: 5310 or equivalent. A

6130 Integer Programming (3) Theoretical and computational aspects of integer programming with emphasis on the branch-and-bound and cutting-plane methods. Mathematical programming models in continuous time. Prereq: 5310 or equivalent. A

6140 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

6150 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

6160 Markov Decision Models (3) Formulation and analysis of Markov chain models; Markov chain models which incorporate decisions—then formulation, application and solution through policy iteration. Stochastic dynamic programming models in continuous time. Prereq: 5210.

6170 Location Models (3) Application of linear, nonlinear, and integer programming techniques to problems of optimal location of new facilities. Prereq: 5310 or equivalent. A

6170 Special Topics (3) Prereq: 5310:20-30 and consent of instructor. May be repeated. Maximum 9 hrs. A

6180 Sensor Seminar (1-3) Subjects selected from current management literature. F, W, S

Marketing and Transportation
D. J. Bandy (Chaired), Ph.D. Purdue.

Marketing


Marketing Assistant Professors: R. L. Jones, Ph.D. Purdue; D. J. Bandy, Ph.D. Purdue.

MBA Concentration: Marketing. DBA Concentration: Marketing.

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

6010 Marketing Trends (3) The impact of trends and new developments on marketing strategy. (3) Prereq: 5310 or equivalent. Required for the non-thesis student not otherwise required. Students who expect to graduate with a degree in non-business marketing applications, must take 6010 and 6020. Prereq: Consent of instructor. A


6110 Sales Force Management (3) Basic communication, motivation, development and application of sales force management. Personnel selection, training, motivation, performance control, and evaluation of effectiveness. Prereq: 5310. S, F

6300 Promotion Management (3) Management of promotional activities and sales promotion. Emphasis on advertising, selling, sales promotion, advertising media selection, and evaluation of effectiveness. Prereq: 5310. F


6160 Advanced Marketing Strategy (3) Components of marketing strategy including development of marketing plans and implementation of marketing strategies. Prereq: 5310 or equivalent. S


5010, 5110, 5130, 5220.

5002 Non-Thesis Graduation Completion (3-15) Requirements. May be repeated. S/NC only. E

5010, 5110, 5130, 5220.

Transportation

Assistant Professors: E. O. Dille (Emeritus), Ph.D. Ohio State; R. W. Woodruff, DBA Indiana; J. L. Frye, Ph.D. Florida;

MBA Concentration: Transportation and Logistics.

Minimum Course Requirements for MBA Concentration: 18 credit hours required including 5110, 5120, 5220. Transportation 5101 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 required. May be taken by students who use university facilities and/or faculty time before fall semester. Prereq: Consent of instructor. A


5120 Management and the Pricing Problem (3) Critical analysis of application of economic theory and regulatory principles to pricing of carrier services. Prereq: 5101.

5130 Carrier Transportation Management (3) Analysis, design, and implementation of carrier management strategies. Consideration of how social, technical, legal, and environmental environment affects top level decision making. Application of general business, marketing, finance, and statistical decision processes to transportation decision making in uncertain environment. Prereq: 5101.

5220 Logistics/Inventory System (3) Development of decision strategies 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 5010. W

5410 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 urban transportation systems. Prereq: 5101.

5810 International Transportation Policy (3) Comparative analysis of transport systems with emphasis on major transportation services: air, ocean, rail, and truck transportation. Prereq: 5101.

5930 Advanced Law and Regulation (3) Legal rights and responsibilities of shippers and carriers. Analysis...
Department.

For a thesis option consisting of a minimum of 45 hours, work outside the department, and statistics courses, a minimum of the total hours in each program must be at the graduate level.

Graduate degreewith a background in applications of statistics.

Statistics concentration targeting statisticians. A special industrial seminar.

Department.

Statistics

Major degree

Statistics

Professors:

G. L. Schneider (Chairman), Ph.D. Stanford; D. D. Chambers (Emeritus), M.B. Texas; R. A. Adell, Ph.D. Purdue; J. W. Miller, Ph.D. Florida; W. C. Leibhart, Ph.D. (Emeritus) Virginia Polytechnic Institute.

Associate Professors:

G. E. Ramey, Ph.D. North Carolina State; R. S. Sanders, Ph.D. Texas; M. S. Younger, Ph.D. Virginia Polytechnic Institute; Assistant Professor: J. L. Schmidhammer, Ph.D. Pittsburgh.

The Master's 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 major in mathematics or 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 pass a minimum of 48 hours of approved coursework to include:

(1) a minimum of 27 hours in graduate statistics courses.
(2) a minimum of 9 hours in collaborative 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 hours to include:

(1) a minimum of 24 hours in graduate statistics courses;
(2) 9 hours credit for master's thesis.

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 5310. Normals: Statistics 5250-65-75 are also included which require 3450 as a prerequisite.

Course Prerequisites: 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 courses work.

Course Descriptions:


4415 Sampling Techniques and Theory (3) Procedures used in probability sampling for a variety of arrangements 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 5310 E.

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

5062 Non-Thesis Graduation Completion (3-15) E.

5002 Non-Thesis Graduation Completion (3-15) E.

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

Selected after discussion with the major departments. Required course work will be as a minor for students majoring in other graduate degrees with a major in Communications.

New students normally are admitted to the program only at the beginning of fall quarter. However, under special circumstances, a student may be admitted at the beginning of another quarter in a temporary non-degree status. Applications for fall admission must be received by May 1.

A baccalaureate degree in communications or a related field is recommended. Admission is possible with other baccalaureate degrees; however, all applicants without the appropriate background shall be required to take up to 26 quarter hours of prerequisite and co-requisite courses. The appropriate background includes the undergraduate introductory courses in advertising, broadcasting, public relations, and newswriting, and up to four additional courses, suitable to the student’s interest, as assigned by the major advisor. Students may take a proficiency test on any prerequisite course, subject to review by the Master’s Committee of the College of Communications.

Students who have had no courses in their major area of concentration may expect to spend six or more full-time quarters in the program, including a media internship.

Degree Requirements: The M.S. program emphasizes communications management in the areas of advertising, broadcasting, journalism, and public relations. A minimum of 45 hours of approved graduate work is required:

- 12 hours of core courses:
  - Communications 5100, 5121, 5140, and 5470, 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.

- Additional courses consisting of one graduate-level law course from the Communications, Business Administration, or Law Colleges, and one each from Advertising, Broadcasting, and Journalism from the following list:
  - Advertising 3310 or 3340, Broadcasting 4670 or 5610, Journalism 4420, 5210, or 5710.
  - 12 hours in a major area within the College, including at least 6 hours at the 5000 level. An internship, if needed, is included.

- 9 hours of thesis (Communications 5000), including 3 hours of thesis seminar.

Students interested in subsequent entry into a doctoral program are advised to take additional courses in communications theory and research, subject to advisor’s approval.

All students in the Master’s program without an undergraduate background or professional experience in communications will normally complete an internship that involves professional experience in communications field. The student’s internship experience requires approval by his/her advisor. Credit will be given through Advertising 9990, Broadcasting 9990, or Journalism 9980 on the basis of 3 credit hours for the equivalent of 10 weeks of full-time professional experience. This credit is to be included in the student’s 45-hour M.S. program.

Previous professional experience will be evaluated by the student’s committee.

After completion of the formal program of coursework and thesis research, the student must pass an oral examination conducted by the assigned graduate committee.

Communications majors in the M.S. program must demonstrate ability to use a typewriter proficiently within their first quartile of residence.

DOCTOR OF PHILOSOPHY

The Ph.D. degree with a major in Communications is intended to prepare scholars for teaching, research, administration, and public service in the field of human communications. The program is interdisciplinary, consisting of a required core curriculum and
required 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 Ph.D. 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 are normally minimal requirements for admission to full potential candidate status: (1) 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; (2) above the fifty percentile in verbal and quantitative aptitude on the Graduate Record Examination; (3) completion of the California Psychological Inventory; (4) endorsement by at least three former teachers or profession- al colleagues; (b) 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. are:

1. Core

Graduate Communications 5120, 5121, 5140, 5200, 5410, 5420, 5470, 5100, 6140, 6141; 600;
6300, plus 6 additional hours of advanced research coursework (course work above 5960); 6 graduate hours of education; 3 graduate hours of research courses; Computer Science 4130 or equivalent.

2. Primary Concentration

(Advertising, Journalism, Mass Communications, or Communication) 18 hrs.

(Outside the College of Communications or a concentration in Communications) 36 hrs.

Total 132 hrs.

Admission to candidacy must be attained at least three quarters prior to graduation and require successful completion of a comprehensive examination.

A diganostic exam also must be taken about two quarters after entering the doctoral program. The exam covers Communications 6100, 5210-21, 5140, 5150, 5160, and 5100 or equivalent.

REQUIRED SCHOLASTIC AVERAGE

A high average is normally required of applicants whose graduate grade point average, not including prerequisite courses, is 3.0 or at any time after the end of 12 hours of graduate credit will be placed on probation. A failing grade on probation will be dropped from the program unless his or her cumulative grade point average is 3.0 or higher at the end of the probationary period. The probationary period is defined as the next 12 quarter hours of graduate 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 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 gradu- ate 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 stu- dents, 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, 382 Com- munications Building, 974-3031.

Communications

MAJOR DEGREES

Communications M.S., Ph.D.

Professors:


Associate Professors:


5000 Thesis (1-15) F only, E

5100 Introduction to Graduate Courses (3) Scope and methods of advanced study in communications. Infor- mation sources, literature review methods, scholarly style, thesis and degree requirements, and procedure, overview of traditional and behavioral research methods.

5120 Communications Research Design (3) Experimental and survey research design, statistical techniques and report preparation. May be repeated. Maximum 5120, 5140.

5121 Communications Research Methods (1) A study of research methods and information sources. S/N Con only. F

5122 Communications Research Methods (2) The study of research methods and information sources. S/N Con only. F

5123 Advanced Principles of Mass Communications (3) A course covering all phases of mass commu- nications including history, development and current status of communications industry, principles of broad- casting, and principles of advertising.

5140 Mass Communication Theory (3) A critical appraisal of selected hypotheses and theoretical concepts in major theories of mass communication. Techniques of communication processes. Prereq: 5100 or 5140. Required repeat: 5140, F

5150 Seminar in Communications Issues (6) Contemporary issues in communications. Prereq: 5100 and 5140, or consent of instructor. May be repeated. Maximum 6 hrs.

5200 Seminar in Communications Education (3) Principles and historical perspectives of education for (journalism, broadcasting, and advertising.

5410 Seminar in Communications Law (3) Legal issues, privileges, and issues affecting mass media, the law of libel and invasion of privacy, depiction of obscenity, exclusion of evidence in court, the regulation of broadcasting, advertisement, and publicity; copyright, and other legal information. F

5420 Seminar in Media Economics and Manage- ment (3) Electronic and print media economics and finance, role of new technologies and marketing techniques; corporate personnel policy, budgeting and expansion. Prereq: 5100 or equivalent. F

5970 Independent Study (1) Reading, research, or projects on special topics in communication. On indi- vidual design, Faculty review, and Faculty director's consent, with approval. May be repeated.

6003 Doctoral Research and Dissertation (3-18) P/ NP only, E

6100 Introduction to Doctoral Studies (1) Doctoral degrees and dissertation requirements. Committee formation and procedure; Advanced research design and methods. F

6140 Mass Communication Theory II (3) Application of theory to contemporary mass communication prob- lems. Topical approaches; literature review and analytical papers. Prereq: 5120, 5140. W

6410 Dissertation (1-24) F only. F

6120 Seminar in Communication Topics (3) Identification, presentation and analysis of special issues and problems in contemporary mass communication. Field study of media organization, content analysis, and social research. Prereq: 5120, 5140. Required repeat: 5120 or equivalent. S

6300 Survey Research Methods in Communications (3) Survey methods applied to opinion and communica- tion research problems. Planning, sampling, questionnaire construction, data gathering (personal, mail, and telephone), data processing and interpretation. Attitude measurement and message presentation techniques. Prereq: 5120 or consent of instructor. W

6310 Experimental Research Methods in Communica- tions (3) Experimental methods applied to communications research problems. Correlational or experi- mental research techniques. Prereq: 5120 or 5140. Required repeat: 5120 or consent of instructor. W

6320 Seminar in Historical Research Methods in Communications (3) Materials and methods in his- torical, descriptive, and legal research in communications theory and behavior. Prereq: 5100, 5120. Re- quired repeat: 5120 or consent of instructor. W

6330 Content Analysis (3) Content analysis as mass communication research technique, conceptual foundations, Research design, categorization, sampling procedures, data gathering, and analysis.

College Of Communications/Advertising 49
Advertising

Professors: A. D. Farmer, Ph.D., Indiana; J. D. Naidies, Ph.D., Minnesota; D. G. Nielson, Ph.D., Illinois.

Associate Professors: J. B. Pickering, Ph.D.; D. R. Barnard; D. J. Vose, M.S., Tennessee.

Associate Professor: H. T. Taylor (head), Ph.D., Illinois.

Assistant Professors: 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. Lectures and labs. Prereq: 3650 with grade of "C" or better or consent of instructor. W, F. Sp.

3690, Advanced Advertising Copy and Layout (4) Creative strategy and execution of advertisements for mass media. Problems in idea creation for advertisements. Lectures and labs. Prereq: 3630 with grade of "C" or better or consent of instructor. F, W, Sp.

3690 Advertising Media (3) Media, markets, and audiences. Evaluation of media in relationship to communication needs of advertisers. Prereq: 3600 with grade of "C" or better or consent of instructor. E.


4910 Speech for Broadcasting (3) Fundamental broadcast conditions affecting the announcer; pronunciation; preparation of production scripts; and relationship to other media. Prereq: Speech 2311. F, W.

4620 Radio Production (3) Study of radio production, past and present. Fractionalization with production tools and techniques. Group and individual production assignments. Prereq: 3650 or consent of instructor. Cannot be taken for graduate credit by communication majors.

4600 Television Production (3) Overview of elements of television production: cameras, sound, lighting, film, videotape recording, optics, and studio control centers. Presented with the hyperpen and professional broadcaster in mind. Prereq: 4620 or consent of instructor. Cannot be taken for graduate credit by communication majors.

4040 Television Production (3) A semi-independent course in television production, producing, directing, and performing with orientation to the professional/broadcaster student. Prereq: 4600 or consent of instructor. Sp.

4100 Broadcast News (3) Principles and practice of operating local news and public affairs events for radio and television. Emphasis on writing for publications, producing broadcast news, researching, writing, editing, and conducting news conferences. Prereq: 3630 or 3670 or consent of instructor. F and 1 lab. Sp.


4150 Issues in Journalism (3) Topics vary. May be repeated. Maximum 6 hrs.

4160 Radio-Television Management (3) Business policies, practices and procedures for radio- television advertising. Emphasis on managerial and professional aspects. Prereq: 3610 or consent of instructor. F.

4710 Public Relations Cases (3) Case studies and problems. Prereq: 3360 Television and Radio Advertising or consent of instructor. E.

4310 Reporting Public Affairs (3) Reporting news of state, county and local government. Emphasis on writing for publication. Prereq: 2220 and 3310 or consent of instructor. W.

4210 Broadcast News Operation (3) Theory and practice of operating local news and public affairs events for radio and television. Emphasis on writing for publications, producing broadcast news, researching, writing, editing, and conducting news conferences. Prereq: 3630 or 3670 or consent of instructor. F and 1 lab. Sp.

4240 Educational Broadcasting (3) Analysis of educational objectives and methods. Emphasis on evaluation of educational program materials. Prereq: 3660 or consent of instructor. F.

5970 Independent Study (3) E

5980 Internship (3)

Broadcasting

Professors: S. E. Diener (head), Ph.D., Northwestern; J. G. Askold, Ph.D., Bowling Green; M. R. Howard, Ph.D., Ohio.

Associate Professor: A. D. Farmer, Ph.D., Indiana;

Communications Specialist: J. R. Carr, M.S., Tennessee.

3980 Television and Radio Advertising (3) Principles of successful radio-television advertising, emphasis on broadcasting. Lectures and labs. Prereq: 3690 Bw.


4150 Speech for Broadcasting (3) Fundamental broadcast conditions affecting the announcer; pronunciation; preparation of production scripts; and relationship to other media. Prereq: Speech 2311. F, W.

4620 Radio Production (3) Study of radio production, past and present. Fractionalization with production tools and techniques. Group and individual production assignments. Prereq: 3650 or consent of instructor. Cannot be taken for graduate credit by communication majors.

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