Graduate Studies/1977

The University of Tennessee Record

The University of Tennessee Record, Volume 80, Issue No. 1, January, 1977. Published monthly except February, April, May, June, August and October by The University of Tennessee, Knoxville, Tennessee 37916. Second-class postage paid at Knoxville, Tennessee.
### Student Calendar for 1977

#### Winter Quarter, 1977
- **January 3-4 (Monday-Tuesday)**: Registration, Classes Begin
- **January 5 (Wednesday)**: Change of Registration Deadline
- **February 8 (Tuesday)**: Classes End
- **March 15 (Tuesday)**: Commencement
- **March 17 (Thursday)**: Spring Quarter, 1977

#### Spring Quarter, 1977
- **March 24-25 (Thursday-Friday)**: Registration
- **March 28 (Monday)**: Classes Begin
- **April 8-9 (Friday-Saturday)**: Easter (No Classes)
- **May 2 (Monday)**: Change of Registration Deadline
- **June 7 (Tuesday)**: Classes End
- **June 10 (Friday)**: Commencement

#### Summer Quarter, 1977
- **June 15-16 (Wednesday-Thursday)**: Registration, First or Both Terms
- **June 17 (Friday)**: Classes Begin
- **July 4 (Monday)**: Independence Day (No Classes)
- **July 5 (Tuesday)**: Change of Registration Deadline, First Term
- **July 19 (Tuesday)**: Classes End, First Term
- **July 20 (Wednesday)**: Registration, Second Term
- **July 21 (Thursday)**: Classes Begin, Second Term
- **July 21 (Thursday)**: Change of Registration Deadline, Full Term
- **July 21 (Thursday)**: Classes End
- **July 21 (Thursday)**: Commencement
- **August 8 (Monday)**: Registration, First or Both Terms
- **August 19 (Friday)**: Classes Begin
- **August 23 (Tuesday)**: Change of Registration Deadline

#### Fall Quarter, 1977
- **September 19-21 (Monday-Wednesday)**: Registration
- **September 22 (Thursday)**: Classes Begin
- **October 26 (Wednesday)**: Change of Registration Deadline
- **October 28 (Friday)**: East. Tenn. Educ. Assoc. (No Classes)
- **November 5 (Saturday)**: Homecoming (No Classes)
- **November 19-21 (Monday-Wednesday)**: Thanksgiving (No Classes)
- **December 6 (Tuesday)**: Classes End
- **December 9 (Friday)**: Commencement

#### Winter Quarter, 1978
- **January 3-4 (Tuesday-Wednesday)**: Registration
- **January 5 (Thursday)**: Classes Begin
- **February 8 (Wednesday)**: Change of Registration Deadline
- **March 15 (Wednesday)**: Classes End
- **March 17 (Friday)**: Commencement
The University of Tennessee, Knoxville does not discriminate on the basis of sex 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. This policy extends to both employment by and admission to the University. Inquiries concerning Title IX should be directed to the Office of the Vice Chancellor for Planning and Administration, Room 506, Andy Holt Tower, (615) 974-4391. Charges of violation of the above policy should also be directed to the Office of the Vice Chancellor for Planning and Administration.
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201 Morgan Hall
202 Greenhouse
203 Power Plant
204 Old Agricultural Engineering Bldg.
205 Agricultural Engineering Bldg.
206 Agricultural Engineering Lab.
207 Plot Barn
208 Tenn. State Division of Forestry
209 Fiber Lab.
210 Spinning Lab.
211 Entomology-Plant Pathology Bldgs.
212 Ellington Hall-Plant Sciences
213 C.E. Brehm Animal Sciences Bldg.
214 McLeod Food Technology Building
215 Dairy Products Building
216 Corn-Cotton Building
217 McCord Hall
218 College Greenhouse
219 College of Veterinary Medicine

Main Campus

"The Hill"
Graduate Office
115 Student Services Building
The Graduate School Office Hours

Monday - Friday 8:00 A.M.-5:00 P.M. (All Year)/115 Student Services and Administration Building
Telephone - (615) 974-3251

The Graduate School Administration
L. Evans Roth, A.B., M.S., Ph.D., Vice Chancellor for Graduate Studies and Research
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Dr. Franklin Hamilton Dec. 31, 1977
Dr. Edwin H. Hammond Dec. 31, 1977

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Dr. H. Dudley Dewhirst Dec. 31, 1978
Dr. Tom Kirk Dec. 31, 1977
Dr. John R. Ray Dec. 31, 1977
Dr. Gerald Ubben Dec. 31, 1977
Dr. Charles H. Ball Dec. 31, 1978
Dr. William C. Coffield Dec. 31, 1978

Col. of Bus. Admin.
Dr. B. Dan Marks Dec. 31, 1978
Dr. Charles J. Noel Dec. 31, 1977
Dr. Robert J. Daverman Dec. 31, 1978
Dr. B. J. Leggett Dec. 31, 1978
Dr. Jeffrey Becker Dec. 31, 1979
Dr. Otis Stephens Dec. 31, 1979
Dr. James Tanner Dec. 31, 1977

Col. of Communications

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Ms. Elizabeth
Christy Hughes Apr. 30, 1977
Dr. Gideon W. Fryer Dec. 31, 1977
Dr. James Wu Dec. 31, 1979

School of Social Work

UT Space Institute

Regulations Subject To Change

Any and all course offerings, academic requirements and other information contained in this publication are subject to change and/or revocation without notice. Anyone interested in the precise course offering, academic requirement at a given time, or other special information should make inquiry in advance.
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John J. McDow, B.S., M.S., Ph.D., Dean of Admissions (Undergraduate) and Records
### Majors and Degrees Available

<table>
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<tr>
<th>College of Agriculture</th>
<th>DEGREE</th>
<th>APT.</th>
<th>ADV.</th>
<th>G.M.A.T</th>
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<tr>
<td>Agricultural Biology</td>
<td>M.S.</td>
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<td>Agricultural Extension</td>
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<td>Agricultural Mechanization</td>
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<td>Animal Science</td>
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<td>Forestry</td>
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<td>Wildlife and Fisheries Science</td>
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<td>Economics</td>
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<td>X</td>
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<td>* Statistics</td>
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<td>X</td>
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<td>Communications</td>
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<td>Adult Education</td>
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<td>Curriculum</td>
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<td>Elementary Education</td>
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<td>Foreign Language Education</td>
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<td>Industrial Education</td>
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<td>Instructional Materials</td>
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<td>Physical Education</td>
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<td>Public Health Education</td>
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<td>Recreation</td>
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<td>Safety Education and Service</td>
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<td>ED.S.</td>
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<td>School Health Education</td>
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<td>Science Education</td>
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<td>Special Education</td>
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<td>Vocational Rehabilitation Counseling</td>
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<tr>
<th>College of Engineering</th>
<th>DEGREE</th>
<th>APT.</th>
<th>ADV.</th>
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<tr>
<td>¹ Aerospace Engineering</td>
<td>M.E., M.S., PH.D.</td>
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<td>² Chemical Engineering</td>
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<td>³ Civil Engineering</td>
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<td>⁴ Electrical Engineering</td>
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<td>⁵ Engineering Administration</td>
<td>M.S.</td>
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<td>⁶ Engineering Science</td>
<td>M.S., PH.D.</td>
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<td>Environmental Engineering</td>
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<td>⁷ Industrial Engineering</td>
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<td>⁸ Mechanical Engineering</td>
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<td>⁹ Metallurgical Engineering</td>
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<td>¹⁰ Nuclear Engineering</td>
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<td>¹¹ Polymer Engineering</td>
<td>M.S., PH.D.</td>
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*ADMISSION TEST LETTERS OF REQUIRED G.R.E. RECOMMENDATION 3-Former Professors 3-Departmental Rating Forms 5-All Ed.S., Ph.D. and Ed.D. applicants obtain special forms from the Graduate School

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8
<table>
<thead>
<tr>
<th>Degree</th>
<th>College of Home Economics</th>
<th>Degree</th>
<th>College of Liberal Arts</th>
<th>Degree</th>
<th>School of Biomedical Sciences</th>
<th>Degree</th>
<th>School of Library and Information Science</th>
<th>Degree</th>
<th>School of Planning</th>
<th>Degree</th>
<th>School of Social Work</th>
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<tr>
<td>M.S.</td>
<td>Child and Family Studies</td>
<td>M.S.</td>
<td>Anthropology</td>
<td>M.A.</td>
<td>Biomedical Sciences</td>
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<td>M.S.</td>
<td>Consumer Studies and Housing: Public Policy</td>
<td>M.S.</td>
<td>Art</td>
<td>M.A.</td>
<td>Library Science</td>
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<tr>
<td>M.S.</td>
<td>Crafts, Interior Design and Housing</td>
<td>M.S.</td>
<td>Audiology</td>
<td>M.A.</td>
<td>Planning</td>
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<td>M.S.</td>
<td>Food Science</td>
<td>M.S.</td>
<td>Biochemistry</td>
<td>M.S.</td>
<td>Social Work (Memphis, Nashville and Knoxville)</td>
<td>M.S.</td>
<td>Planning</td>
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<td>Food Systems Administration</td>
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<td>Biology</td>
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<td>M.S.</td>
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1 Offered only at UT Space Institute.  
2 Offered also at Oak Ridge and Kingsport and other off-campus locations.  
3 Department doctoral option offered under the major of Home Economics  
4 Interdisciplinary: option offered in each department  
5 Ph.D. applicants only.  
6 American applicants only.  
7 Ed.D. applicants only.  
8 Ed.S. applicants only.  
9 International applicants only.  
10 Interdisciplinary Ph.D. applicants only.
The Graduate School

L. Evans Roth, Vice Chancellor for Graduate Studies and Research

The mission of The University of Tennessee, Knoxville, is to offer in-struction on all levels of higher education, engage in and train for research, and provide extended services of great variety. The obligations of this mission are reinforced by the fact that The University of Tennessee is both the State University and the official Land-Grant Institution of Tennessee.

Advanced Graduate Work and Research

The University of Tennessee has some obligations not shared in the same degree by other public colleges and universities of the state, although these specialized functions are common to most major state universities and land-grant institutions. For instance, the University must develop and maintain advanced instruction and research in the basic arts and sciences and in professional and occupational areas dependent upon the fundamental fields of learning, especially (but not exclusively) those of substantial importance to the state. It is the business of such a state university to advance the frontiers of knowledge in all areas of human concern, to discover facts previously unknown, to present new theories and test those previously not established, and thereby augment the intellectual heritage of the human race. The major basic research in America is conducted in American universities.

This research obligation is not primary in all colleges, but the search for new knowledge and its application to the chang-
specialization in many aspects of atmospheric and space flight such as subsonic to hypersonic aerodynamics; aerospace vehicle design; control and guidance; modern materials and structures; propulsion systems; aircraft noise and sonic boom; flight simulation; avionics; plasma-dynamics; flow diagnostics including spectroscopic and electrooptic means; systems management and cybernetics. Course work and research work in related areas of environmental pollution control, earth resources, energy conversion, materials and systems and simulation are also available. The research personnel and facilities of the Institute and those available at the Arnold Center through appropriate contractual arrangements provide an outstanding opportunity for meaningful research in these and other areas. Students who enroll at UTSM must be admitted to the Graduate School, University of Tennessee, Knoxville. Further information concerning the Institute may be obtained from the Dean, The University of Tennessee Space Institute, Tullahoma, Tennessee 37388. Application forms and an announcement of the Institute's programs are available upon request.

The University of Tennessee at Nashville: Opportunities for graduate study leading to the degree of Master of Science in areas of civil engineering, engineering administration, and industrial engineering are offered by The University of Tennessee, Knoxville, and are administered by the Vice Chancellor for Graduate Studies and Research. Students who enroll in those programs must be admitted to The University of Tennessee, Knoxville, Graduate School. Information and appropriate forms may be obtained from the Registrar, The University of Tennessee, 10th and Charlotte, Nashville, Tennessee 37203.

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 to do research in conjunction with the Biology Division of the Oak Ridge National Laboratory.

For complete information concerning the program, see page 147.

School of Social Work: The University of Tennessee 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 Nashville, Knoxville, and Memphis.

For complete information concerning the programs, see page 154.

Radiation Biology: A graduate major in the field of radiation biology leading to the M.S. and Ph.D. degrees is offered through the Institute of Radiation Biology.

For complete information concerning the program, see page 146.

Admission and Registration

Admission to the Graduate School requires a Bachelor's degree, or its equivalent, with a satisfactory grade point average from an accredited college or university. (A minimum grade point average of 2.5 out of a possible 4.0, or a 3.0 for the senior year, is considered a satisfactory grade point average. Meeting the minimum admission requirement does not insure acceptance into a degree program since other factors may prevent admission in some areas.)

An application cannot be processed without the $10 fee (payable to The University of Tennessee).

If permission to enter The University of Tennessee Graduate School is given prior to graduation, this admission is automatically withdrawn if the Bachelor's degree is not awarded before the date of registration.

If an applicant does not enter Graduate School the quarters in which admission is requested, the file is destroyed after one year unless permission is requested and granted to enter in a future quarter. Applicants who reapply must submit a new application and fee.

Admission to the Graduate School does not imply admission to candidacy for the degree desired; admission to candidacy must be obtained after entry but at least one full quarter prior to receipt of the Master's degree and three quarters prior to receipt of the Doctorate.

Types of Admissions

Admission to a Graduate Degree Program:
Master's Degree—Admission to a degree program requires a minimum grade point average of 2.5 out of a possible 4.0 or 3.0 during the senior year. However, many departments require a higher average. (Refer to pages 8-9 for items required for admission.)

Doctor's Degree—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 Master's level studies, achievement on aptitude tests for graduate studies, letters of recommendation from professors familiar with the applicant's capabilities, and similar evidences of scholarly achievement. (Refer to description of doctoral programs for specific requirements for admission.)

Non-degree Graduate Students: No more than 18 hours of course work completed by a student while in the non-degree status may be included in a Master's degree program. The applicant must have a satisfactory grade average (2.5 out of a possible 4.0 or 3.0 during the senior year). Non-degree students may take courses for graduate credit, providing the department approves the registration, but cannot be admitted to candidacy for a degree without first gaining admission to a graduate degree program.

Some departments will not permit non-degree students to register for graduate credit. Please contact the head of the department in which a major is planned concerning registration for graduate credit. No international student may enroll as a non-degree graduate student.

Transient Graduate Students: A student who has been admitted to a degree program at another institution and who wishes to take courses for transfer to that institution may be admitted on receipt of the Certification of Transient Graduate Admission Form which may be obtained from The University of Tennessee Graduate School. This form must be completed PRIOR to registration. A student may take no more than 18 total hours of courses while in transient status.

Eligibility of Seniors: A senior in The University of Tennessee who needs less than 45 quarter hours of registration may apply for a Master's degree in The University of Tennessee at Nashville, Knoxville and Tullahoma. Further information concerning registration for graduate credit may be obtained from the Vice Chancellor for Graduate Studies and Research. Such approval must be obtained each quarter at registration through the Graduate Office.

Admission of Faculty Members: Faculty members may be admitted to the Graduate School through established procedures. However, the following persons may not receive doctoral degrees from The University of Tennessee, Knoxville: a. Any member of the instructional, research, library, or administrative staff holding the rank of assistant professor and above or equivalent status at The University of Tennessee, Knoxville; b. Staff in the Institute of Agriculture holding rank of associate professor and above or equivalent status and occupying full-time research and extension positions; c. Any member of The University of Tennessee system administration holding the rank of assistant professor and above or equivalent status, except in the case of Institute of Agriculture personnel as specified in "b" above.

Any exceptions to this policy shall be made by petition to the Graduate Council of The University of Tennessee, Knoxville. Evasion of these restrictions through temporary resignation, acceptance of a lower rank, or leave of absence is not allowable.

A faculty member may, however, do graduate work on a non-degree basis.

Admission of International Students: The Graduate School can accept only students who have outstanding records. A student from China must possess a Bachelor's degree with a grade point average of 80.0 or above for the last two years of a four-year program. A student from India must be First Class the last two
years of a four-year Bachelor's degree program after completion of the twelfth grade. All students with a Master's degree must be First Class. Applicants from other countries will be evaluated upon receipt of transcripts.

An applicant must present: (1) a complete and accurate chronological outline of all previous university-level education; (2) authorized school or university records, with certified translations if the records are in a language other than English; (3) evidence of financial resources sufficient to provide him/her with at least $4600 (U.S.) per academic year during the period of registration as a student; and (4) certification of proficiency in English. Every international student must submit a certification of English proficiency certification) must be completed and accurate chronological outline of all previous university-level education; (2) authorized school or university records, with certified translations if the records are in a language other than English; (3) evidence of financial resources sufficient to provide him/her with at least $4600 (U.S.) per academic year during the period of registration as a student; and (4) certification of proficiency in English. Every international student must submit a certification of proficiency in English.

Admission Procedures

Procedures for admission as follows: (1) complete the "Application for Admission" form (first page of the catalog); select a major from those listed on pages 8-9; (2) return the completed application form along with a $10 application fee as soon as possible; (3) request the registrar of all colleges and universities attended to send two official transcripts to the Graduate School Office (all documents, including transcripts, submitted for admission become the property of the University and will not be returned); (4) if required, submit scores from the Graduate Record Examination or Graduate Management Admission Test; and (5) request that any reference or rating forms required as part of the application file be sent to the Graduate Office or where indicated. Anyone with a Bachelor's degree wishing to take courses for graduate credit, whether or not he or she desires to become a candidate for a degree, must make formal application for admission to the Graduate School or submit the certification of Transient Graduate Admission Form.

Examinations

Applicants for admission to many of the degree programs are required to submit scores from the Graduate Record Examination or the Graduate Management Admission Test. (Refer to pages 8-9 for majors requiring these examinations.) Each applicant is individually responsible for arrangements for the examination and for transmission of these scores directly from Educational Testing Service to the Vice Chancellor for Graduate Studies and Research. Application forms may be obtained from the Graduate School or submit the Certification of Transient Graduate Admission Form. No action is taken until a file is complete.

Registration Procedures

Dates of registration are listed in the University Calendar (front of catalog). Students must report to the Graduate School to obtain registration materials (scan form and timetable of classes giving details concerning registration procedures) and then should see a department advisor to obtain a signature. Registration requires two days. The university holds advanced registration each quarter (approximately four to six weeks after each quarter begins). Information may be obtained from the Graduate Office. If a student participates in advanced registration, the student should obtain the class schedule and pay fees on the first day of registration. All graduate students, including graduate and teaching assistants, research assistants, and scholarship or fellowship holders, should complete the registering procedure at registration (in Stokely Athletic Center) or afterwards at the Treasurer's Office, where the assessment of their tuition and fees will be determined. Those who do not report to the Treasurer's Office before the established deadline for paying fees will be charged the late registration fee. Retroactive registration is not permitted.

Fees, Financial Aid, and Fee Classification

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 and Post-Baccalaureate students are as follows:

APPLICATION FEE: $10.00

Each graduate application for admission must be accompanied by a fee of $10 before it will be processed. (Fee not required if: (1) former UTK graduate student; or (2) graduate application fee previously paid to a UT system school.) If a student applies but does not enter graduate school within 12 months after date of requested admission, it will be necessary for him or her to resubmit the $10 application fee and application. This fee is not refundable.

MAINTENANCE FEE (all students): PER QUARTER $160.00

TUITION (additional for out-of-state students): PER QUARTER $300.00

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

In-State $22.00 per quarter hour or fraction thereof; minimum charge $66.00

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

In-State $22.00 per quarter hour or fraction thereof; minimum charge $66.00
Out-of-State $52.00 per quarter hour or fraction thereof; minimum charge $156.00 All fees collected at registration are subject to audit for correctness. Adjustments, if needed, will be made after final audit.

UNIVERSITY PROGRAMS AND SERVICES FEE: PER QUARTER $15.00 All graduate students taking in excess of six quarter hours per quarter will be assessed a university programs and services fee of $15 per quarter. Part-time students taking six quarter hours or less will be assessed at the rate of $1 per quarter hour or fraction thereof; minimum charge $3.

The fee for the summer quarter will be $12. Part-time students taking six quarter hours or less will be assessed at the rate of $1 per quarter hour or fraction thereof; minimum charge $3.

Graduate and teaching assistants, as well as fellowship students who may have waiver of fees (tuition and/or maintenance), must complete their registration at the Treasurer's Office and pay the appropriate part of the fee.

Students enrolled exclusively in Evening School or at off-campus centers will be exempt from the programs and services fee.

Students taking a course load of six hours may elect to pay the full programs and services fee. This fee is not refundable.

LATE REGISTRATION FEE: All students are required to have a validated fee receipt to complete the registration procedure. This includes students whose fees are billed, prepaid, or waived. Students who do not complete registration on the regular dates scheduled for this purpose will be charged a late registration fee of $43. See the University General Catalog for application of this fee. The payment of fees with a check which is not honored by the bank will incur a service charge of $10 to $43, depending on the date the check is redeemed.

MUSIC FEE: One half-hour lesson per week, per quarter $20.00 One hour lesson per week, per quarter $40.00 Payable by students receiving individual instruction in music.

GRADUATION FEE: Master's degree candidates $16.00 Doctor's degree candidates $41.00 There is no additional charge for diploma, binding, or microfilming.

DEFERRED PAYMENT SERVICE FEE: $3.00 This fee is applicable when the payment of any part of a student's account is deferred, including accounts which must be billed to outside agencies, organizations, and institutions. This fee is also applicable when any additional charge (out-of-state tuition, music fee, room and board adjustment, etc.) is not paid within five regular business days after the date it was incurred.

Students should take the initiative to pay all University obligations promptly.

AUDITORS FEE: Fees for courses being audited are the same as course fees, calculated at the four-hour courses.

REFUND OF FEES FOR WITHDRAWAL: Upon receipt of a class schedule, partial or complete, a student is responsible for payment of appropriate fees. Withdrawal from the University after receiving a class schedule, whether partial or complete, must be by official notification to the Office of Special Services because space in a class section is reserved until released. The minimum of 20 percent of fees will be charged even if classes are not attended. Failure to promptly notify the Office of Special Services when withdrawing could result in a larger percentage fee assessment. The effective date of withdrawal is the date the Office of Special Services is notified by completion of the official withdrawal request form. For a regular academic quarter, withdrawal within seven calendar days beginning with the first day following regular registration permits an 80 percent fee refund. Withdrawal between 8 and 14 calendar days following regular registration permits a 60 percent fee refund. Withdrawal between 15 and 21 calendar days following regular registration permits a 40 percent fee refund. Withdrawal between 22 and 28 calendar days following regular registration permits a 20 percent fee refund. The above refund policy does not apply to the off-campus Graduate Centers. At the Centers, no refund is made after the first 14 days.

No refund is due on individual courses which are dropped unless the sum of the remaining tuition rate plus the adjusted charge for the course(s) dropped is less than the total amount paid or the maximum quarterly tuition and/or maintenance fee. On the Knoxville campus for a regular quarter, no refund is made for courses dropped later than the last calendar day of the regular registration day. A course for which a student has registered is not dropped until a drop/add slip is processed and recorded by the Records Office. Refunds resulting from dropped courses will be made after the final audit at the end of the quarter.

Rental charges and adjustments are determined by the Office of Residence Halls in accordance with the terms of the housing agreement or contract. Note: All charges and refunds will be made to the nearest even dollar.

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.

WAIVER OF FEES: Graduate assistants, teaching assistants and others whose fees are billed, prepaid or waived must complete their registration with the Bursar's Office, where they should have their fee receipt validated and supply necessary details concerning fee payment waiver.

Fee Classification for the Purpose of Paying University Fees

Shortly after a student applies to the Graduate School, notification of the receipt of the application, application fee, and residency classification for fee purposes is sent. If a student has any questions concerning the residency status, he/she should contact the Residency Clerk at the Graduate School Office.

If a student is classified as out-of-state and is a full-time student, as provided that said person is not in this state primarily or at Fort Campbell, Kentucky, and elects to attend the University on a part-time basis (6 hrs. or less), he/she must apply for a waiver of the out-of-state portion of the fees prior to the date of registration each quarter. Forms are available from the Residency Clerk at the Graduate School Office.

Rules for Determination of Status

(1) Every person having his or her domicile in this state shall be entitled to classification as an in-state student for fee and tuition purposes. No person having domicile elsewhere than in this state shall be eligible as an in-state student for tuition purposes.

(2) The domicile of an unemancipated person is that of the parent.

(3) Upon moving to this state, an emancipated person who provides persuasive evidence of domicile may apply for in-state classification for said person's unemancipated children. A person who does not apply to the off-campus Graduate Centers. At the Centers, no refund is made after the first 14 days.

(4) Any person who remains in this state when the parent, having theretofore been domiciled in this state, removes from this state, shall be entitled to classification as an in-state student so long as attendance at a school or schools in this state is continuous.

(5) An unemancipated person whose parent is a member of the armed forces and stationed in this state or at Fort Campbell, Kentucky pursuant to military orders shall be classified as an out-of-state student but shall not be required to pay out-of-state tuition. The student, while in continuous attendance toward the degree for which he/she is currently enrolled, shall not lose his/her residence when the parent thereafter is transferred on military orders.

(6) Part-time students who reside in Tennessee and are employed full-time in the state or at Fort Campbell, Kentucky pursuant to military orders and who would be classified out-of-state in accordance with other provisions of these regulations,
will be classified out-of-state, but will not be required to pay out-of-state tuition while enrolled as part-time students. (Student must apply for this status each quarter).

Presumption. Unless the contrary appears from clear and convincing evidence, it shall be presumed that:

1. (1) No emancipated person shall be deemed to have gained residence while attending any educational institution in this state as a full-time student, as such status is defined by the governing board of such institution.

2. (2) The domicile of a married person shall be determined by the provisions of these regulations independent of the residence of the spouse.

3. (3) A person does not gain or lose in-state status for reason of his/her presence in any state or country while a member of the Armed Forces of the United States, provided that a member of the armed forces may obtain in-state status for the member and dependents by establishing domicile in this state.

Establishment of Domicile. If a student asserts that he/she has established domicile in Tennessee, the student has the burden of proving such assertion.

Appeal. The student who wishes to appeal his/her initial residency classification shall contact the Residency Clerk in the Graduate Office.

Effective Date for Reclassification. If a student classified nonresident applies for in-state residency classification at the beginning of a quarter or semester and is subsequently so classified, the in-state residency classification shall be effective at the beginning of the quarter or semester in which application for reclassification was submitted.

Assistantships and Fellowships

Non-Semester Fellowships supported by the University are awarded on the basis of ability and without regard to the field of study of the candidate. Successful applicants will need better than an overall 3.0 grade point average and high scores from the Graduate Record Examination or the Graduate Management Admission Test. The normal deadline for receipt of completed applications is mid-February. Application packets can be obtained from the Fellowship Assistant, Graduate Office. Information concerning many national competitions for fellowships and scholarships supported by non-University sources can also be obtained from the Fellowship Assistant.

Graduate assistantships and additional fellowships are offered through many departments of the University. The stipends usually cover the entire cost of tuition and fees. Information concerning these opportunities, and appropriate application forms, may be secured by writing to the head of the department in which the student expects to study.

Student Loans

National Direct Student Loans

Long-term loans are available through the National Direct Student Loan Program. Proven need for financial assistance determines eligibility.

Loan repayment and interest payments on National Direct Student Loans are deferred until after graduation or as long as an individual remains in half-time attendance at an accredited institution of higher education in the United States. Repayment may be deferred for a period of three (3) years while the borrower is serving in the Armed Forces, Peace Corps, or Vista. Interest is 3 percent per year on the unpaid balance and the maximum repayment period is ten (10) years with the current minimum annual repayment of $180 or 10 percent of the accumulated loan, whichever is greater.

If upon graduation one becomes a full-time teacher in a public or non-profit school which is designated by the commissioner as having a high enrollment of low-income families or becomes a teacher of the handicapped, 15 percent of the total principal plus interest is cancelled for the first second and third years of teaching, 20 percent for the third and fourth years, and 30 percent for the fifth year. If after graduation one becomes a staff member in a preschool program which is operated for a period comparable to a full school year, 15 percent of principal plus interest will be cancelled for each year of service.

Cancellation at the rate of 12/2 percent of the total principal plus interest will also be made up to 50 percent of the loan for each year of Armed Forces service in an area of hostility.

Graduate level students may be extended the annual loans of $2500 to a maximum accumulated (undergraduate and graduate) loan total of $10,000. The above regulations and provisions of the National Direct Student Loan Program are subject to change by federal legislative action.

University of Tennessee Student Loans

Student loans from University sources, established by friends and alumni of the University, are available to currently enrolled students. One can be extended a loan of up to $250 per quarter to an annual maximum of $750. The interest is 3 percent per annum payable annually on the anniversary date of the note. The loan is made for a specific time period, and is due at the end of a stated number of years from the date of the note. The borrower may, without penalty, pay all or part of the loan at any time before the maturity date.

Student Employment

The College Work-Study Program is administered in accordance with an agreement between The University of Tennessee and the United States Office of Education. To be eligible one must be accepted for enrollment or, if currently enrolled, be in "good standing" with the University. Eligibility further depends upon need for assistance.

Students should contact Director of Financial Aid for information concerning student loans.

Veterans’ Benefits

The Office of the Registrar administers the University’s responsibility for programs of the Veterans Administration. Each veteran or child of a deceased or disabled veteran should apply to the nearest Veterans Administration office for a certificate of eligibility. The application should be made before registration if possible. Certificates of eligibility are sent directly to students who then bring them to the Office of the Registrar for University authentication and processing.

General Information

The University of Tennessee offers its programs of instruction to qualified persons regardless of race, color, creed, sex, or national origin.

Housing

Single Men and Women: Single graduate students are provided excellent accommodations in both traditional and modern facilities which are 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. Specific units of residence halls and of the apartment building have also been designated specifically for single graduate students. In Melrose Hall the graduate section offers community living units for groups of six to ten students with personal responsibility emphasized. The Holt Avenue Apartment Residence Hall accommodates, on a graduate floor, students in groups of three or four. It is the responsibility of each resident to maintain the apartment by University standards. Further information can be obtained from the Office of Residence Halls, 405 Student Services Building.

Assistant Head Resident positions are available for single graduate students. The Assistant Head Resident is responsible to and assists the Head Resident in coordinating and supervising assigned aspects of the operation of the hall to which the assignment is made. The position is a part-time live-in position, with appointment on a 9 1/2-month basis. Summer employment may be possible. Further information can be obtained from the Office of Residence Halls, 405 Student Services Building.

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

Vehicle Operation and Parking

The University of Tennessee endeavors to provide adequate facilities for the in-
students and faculty engaged in educational activities. In addition to the usual peripheral devices, an intracampus bus system is available for graphical output.

The large volume of vehicles operated in and around the University campus necessitates strict adherence to the "University Traffic and Parking Regulations"; consequently, a system of fees for violations of these regulations is established by the University. The importance of compliance with these parking and traffic regulations is indicated by the following policy of the UTK Traffic and Parking Authority.

Any staff member or student who has failed to pay traffic citations is subject to disciplinary action up to and including termination or dismissal from the University.

Students with outstanding traffic citations will not be permitted to register at the beginning of the quarter until indebtedness is cleared.

A staff member with outstanding traffic citations will not be registered to register the vehicle or purchase a parking permit. If a traffic citation is not paid or appealed within 5 days after issuance, a penalty of 50 percent of fee will be assessed. A different penalty applies to fire lane violations.

Office of International Student Affairs

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

The office maintains the student's official immigration records and handles questions regarding immigration regulations. It coordinates such projects as a community volunteer program for international students and activities for student spouses. To aid the international student's understanding of American life, its professional staff serves as advisors on personal and related problems.

Orientation programs are held at the beginning of each term, and international students are urged in advance to attend them.

International students applying for admission should write to: The Vice Chancellor for Graduate Studies and Research, The University of Tennessee, Knoxville.

University Library

The University Library owns approximately 1,280,400 volumes, 1,801,300 manuscripts, 42,500 microfilm reels and 721,300 items of other microtext, plus recordings, tapes, and other serial titles, which are received annually. The library's membership in the Association of Research Libraries indicates the University's emphasis on research and graduate instruction at the doctoral level and the support of large, comprehensive collections of library materials on a permanent basis.

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needed materials, providing access to bibliographic services offered by other institutions, such as computer-based data searches and information retrieval.

Library holdings in Knoxville are housed in the James D. Hoskins (Main) Library and its five branches: Agriculture, Law, Music, Science-Engineering, and the John C. Hodges Undergraduate Library. Special Collections, located in the Main Library, is a repository of regional and local materials, Tennessee, and other specialties, including the legislative papers and memoranda of many Tennessee political figures. Its materials are of particular interest to scholars in the fields of history, political science, the social sciences and the arts.

The libraries located on the statewide campuses in Chattanooga, Martin, Memphis, Nashville, and Tullahoma are individually administered; all libraries of The University of Tennessee are accessible to all students and faculty in the system.

General Regulations of the Graduate School

Responsibility

A graduate student must assume full responsibility for knowledge of rules and regulations of the Graduate School and departmental requirements concerning the individual degree program. A statement on Graduate Students' Rights and Responsibilities is printed on the back of the student's Admission Status Form. Additional copies are available at the Graduate Office.

Requirements

The Graduate School requirements are minimal, and, in many cases, they are exceeded by those of the individual departments. In some cases, departments have brochures describing in detail their programs and requirements.

Correspondence Study

No graduate credit is allowed for work done by correspondence study with this or any other university.

Graduate Credit

No student may receive graduate credit for a course unless properly admitted to the Graduate School. It is expected that students will be so admitted prior to registration for courses carrying graduate credit. In some instances, however, students who appear to meet the criteria for admission are allowed conditional registration for graduate credit after filing an application for admission to the Graduate School and paying the application fee. Transcripts (two official copies) and additional materials required must then be filed with the Graduate Office at once. If the student is admitted within seven weeks from the last day of registration, the student may receive graduate credit for this course. Should the student not be so admitted, whether because of lack of

Consulting services are available for students and faculty engaged in educational or research projects which utilize the computer facilities. Various non-credit short courses in computer programming and utilization are offered, free of charge, throughout the year.

Computing Center

The University of Tennessee Computing Center (UTCC) provides computing facilities for the academic community of the University. It is intended for use by all academic staff whose work requires a modern computational facility and all students whose course work or research entails the use of computer methods.

Both time sharing and batch processing are offered through the Center's IBM 360/65 and DEC 10, located in the Stokely Center for Management Studies. In addition to the usual peripheral devices, a plotter is available for graphical output. The administrative offices and the majority of the programming staff are housed on the second floor of SMC.

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University International House

The International House is located approximately two blocks from the heart of the campus, at 1601 West Clinch Avenue. Provided by The University of Tennessee, and operated by the staff of the Office of International Student Affairs, the House provides a facility where domestic and international students may come together to relax and discuss matters of mutual interest. The small library at "I" House contains both books and periodicals from all over the world.

The University Library

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Interlibrary loan service augments the UTK Library research holdings for faculty and graduate students and includes borrowing monographs, obtaining copies of

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needed materials, providing access to bibliographic services offered by other institutions, such as computer-based data searches and information retrieval.

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qualifications or because of failure to furnish the necessary materials in ample time for a decision concerning admission, the courses being taken will be changed to undergraduate credit, and no future registration will be permitted until the student is properly admitted as a graduate student.

**Change of Registration**

A student's permanent record card will show all courses for which registration has been completed except those from which the student withdraws during the first week after the beginning of classes. The deadline for change of registration (from credit to audit, audit to credit, graduate to undergraduate, undergraduate to graduate, withdrawal, etc.) is set at mid-quarter, approximately 35 calendar days after the first day of classes each quarter. A student may change registration from a course at any time up to and including this date by executing a change of registration slip and submitting this to the Graduate Office. If the student's signature is required, the advisor's signature is not required. The instructor's signature is required to add a course two weeks after classes begin and/or to add a course that is closed. Withdrawal from a course, or from the University, occurs after the first week of classes and before the withdrawal deadline, the grade of W will automatically be entered on the student's record and on the official transcript. A student wishing to withdraw from a course, or from the University, after the withdrawal deadline will receive the grade of F, unless the student can clearly demonstrate that one of the following conditions exists:

a. illness or injury of the student as verified by the student health service or private physician,

b. serious personal or family problems as verified by the student's parents, minister, physician, etc.

c. necessary change in work schedule as verified by the student's employer,

d. change of major to a program in which the student wishes to drop will not normally be used in computing degree requirements. Acceptance of the student into the new program should be verified by the Graduate School,

e. financial inability to continue at the University, or

f. call to active military service.

One of the same conditions must exist for any change of registration. A student will not be permitted to drop a course simply to avoid a poor grade. A student wishing to withdraw from a course, or from the University, after the withdrawal deadline, or change his or her registration shall present the request, together with evidence of extenuating circumstances, to the Graduate Office. If the request is approved, the Graduate Office will notify the Office of Admissions and Records, which will enter the grade(s) of W or the appropriate change on the student's permanent record.

**Maximum Load**

All graduate students are urged to register each quarter for only that number of hours which they can successfully complete. The maximum load for a graduate student is 15 hours, and nine to twelve hours is considered a full load. Registration for more than 15 hours during any quarter including the summer quarter is not permissible without prior approval of the Vice Chancellor for Graduate Studies and Research, who may allow registration of up to 18 hours if the student has achieved an average of 3.6 or better in at least 9 hours of graduate work. Graduate assistants or others who have part-time duties with the University are expected to enroll for no more than an appropriate fraction of the maximum load.

**Advisors**

The Vice Chancellor for Graduate Studies and Research is the general advisor for all graduate students, but so far as particular courses are concerned, a student is counseled by an advisor from the major department. A new student seeking an advisor must go to the department in which the student is to major. At the time of each registration, the advisor must approve the program of study for a student. If the student is pursuing a collateral area of study, the advisor, in approving the student's program, should secure the advice of the department representing the collateral area.

**Auditors**

Persons who wish to attend certain classes regularly, without taking examinations or receiving grades or credit, may do so by completing a graduate application, paying the application fee, registering as auditors, and paying regular fees. Auditors are not permitted to participate in class discussions and recitations, or use laboratory equipment and materials.

**Grades**

Grades in the Graduate School have the following meanings:

- A (4 quality points per quarter hour); indicates superior work.
- B+ (3.5 quality points per quarter hour); indicates above satisfactory work.
- B (3 quality points per quarter hour); indicates satisfactory work.
- C+ (2.5 quality points per quarter hour); indicates performance less than expected.
- C (2 quality points per quarter hour); indicates work of borderline quality. This grade represents work below the standard expected of graduate students.
- D (1 quality point per quarter hour); indicates clearly unsatisfactory work and carries no graduate credit.
- F (no quality point value); indicates extremely unsatisfactory work and carries no graduate credit.

- (no quality point value); indicates that the student has done satisfactory work in the courses, but—because of circumstances beyond control—has been unable to finish all requirements. It is not to be given to enable a student to do additional work to bring a deficient grade. All incompletes must be removed within 2 quarters. If a supplementary grade report has not been received in the Graduate Office one week prior to the end of the second quarter, the I will be converted to an F. The incomplete will not be counted in the cumulative average until a grade is assigned. No student may graduate with an I on his record.

**S/NC** (carries credit hours, but no quality point value); S is equivalent to B or better, and NC means no credit earned. NC grades may be repeated for an S. S/NC grading is allowed only where indicated in the Graduate Catalog. S/N is used for courses which culminate in a thesis, dissertation, or preliminary examination. The N grade takes on the value of the S when the thesis or dissertation is accepted by the Graduate School. The number of S/NC courses to be allowed in a student's program of study shall be limited to one-fourth of the course work hours required (excluding thesis or dissertation) in a program. (This would be 9 hours in a 45-hour Master's thesis program or 12 hours in a 48-hour non-thesis program or 18 hours in a doctoral program of 72 hours excluding dissertation hours.)

Graduate students are required to make an overall minimum grade average of B in courses taken for graduate credit. No graduate student will be allowed to repeat a course for the purpose of raising a grade already received. Transferred work will not be counted in computing the grade average on courses completed in Graduate School.

**Course Numbers**

All 5000- and 6000-level courses are graduate courses. Some 3000- and 4000-level courses, if listed in the Graduate Catalog, are available for graduate credit; however, a "G" must be indicated on the registration material at the time of registration. (A "G" will also be placed on the permanent record beside the hours credit.)

**Prerequisites**

Graduate work in any department must be preceded by sufficient undergraduate work in the major area and related ones to satisfy the department that the student can successfully do graduate work in the chosen field. All prerequisites are not listed in the Graduate Catalog since undergraduate requirements are examined and

* If a student receives an I after finishing the course work for the Master's degree but has not received the degree, he may retake the course with an I with the approval of the Vice Chancellor for Graduate Studies and Research.
evaluated by the appropriate department before admission to a degree program.

Residence Requirements
There is no residence requirement for any Master's program.

The Specialist in Education Degree requires one quarter of full-time study if the student has a Master's degree. A student without a Master's degree is required to have two consecutive quarters of full-time residence.

The minimum residence for any Doctor's degree is one academic year or three consecutive quarters of full-time study. A student in residence is devoting essentially all his/her energies to graduate study on campus. Part-time enrollment does not count toward this requirement. Consecutive quarters include the summer quarter.

Revision of Program
A student who wishes to revise a major program of study must complete a "Request for Revision of Graduate Program" form which can be obtained from the Graduate Office. It is necessary to obtain the signature of the head of the department in which admission was previously granted. No signature is needed if a student is requesting a change from non-degree to a degree program or from one degree to another in the same department.

Time Limit
The time limit for the use of graduate credit toward a Master's degree is six years from the beginning date of the earliest course applied toward the degree. The last 48 hours of credit for an Educational Specialist Degree must also be earned within a period of six years prior to the award.

 Normally, these time limits may not be extended. However, in exceptional cases, courses taken beyond these periods may be recognized after special examination or other means recommended by the department and given prior approval of the Vice Chancellor for Graduate Studies and Research.

The doctoral program must be completed within a period of five years after passage of preliminary examinations.

Graduate School News
The Graduate School News is published quarterly and is available to all graduate students. Calendars, schedules, and new requirements for degrees are published in order for students to have access to the latest information.

Proficiency Examination
A proficiency examination may be given in any academic course offered for graduate credit. A student must be regularly admitted to the Graduate School, and the examination must be recommended by the head of the department offering the course. Students applying for this privilege must present evidence that they have the knowledge and abilities expected of graduate students who have taken the same courses. Upon passing such an examination with a minimum grade of B, the student will receive regular graduate credit. A maximum of three graduate courses may be completed by this method. A fee must be paid before administration of 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.

Law Courses
A graduate student may be allowed to take up to nine quarter hours of law courses and receive credit toward a degree upon approval of the College of Law and department committee chairman. DBA students may take a maximum of 12 hours.

Transfer Credits
A maximum of nine quarter hours (six semester hours) may be transferred into a student's Master's program from work taken at accredited institutions. (Extension courses at other universities are not applicable.) Such work must have been taken for graduate credit and passed with a grade of B or better, be part of an otherwise satisfactory graduate program (B average), and be listed on the Admission to Candidacy Form approved by the committee members and the Vice Chancellor for Graduate Studies and Research. Ordinarily, course work from foreign institutions is not transferred since these institutions have not been accredited. This course work must be completed within the six-year period prior to the receipt of the degree. The same rule applies also to the Specialist in Education Degree. Courses transferred into a student's Master's program may consist of a combination of University of Tennessee System courses and courses from other institutions so long as the total accepted does not exceed one-half the total program, and courses accepted from outside The University of Tennessee System do not exceed nine quarter hours. Transfer credits will be placed on The University of Tennessee transcript record only after the student has been admitted to candidacy.

Courses taken for graduate credit at another institution and passed with a grade of B or better from a satisfactory graduate program (B average) may be accepted in a student's doctoral program. The number of hours a student may include will be determined by the doctoral committee. They must be listed on the Admission to Candidacy form and approved by the committee members. Although the hours may be used as part of the requirements for the degree, the courses will not appear on The University of Tennessee transcript record.

Official transcripts must be received by the Vice Chancellor for Graduate Studies and Research directly from appropriate institutions before any transfer of credit will be approved.

Credits accepted in either the Master's or Doctor's program will not affect the minimum residence requirements, nor will they be counted in determining the student's grade average. Neither will they count toward meeting 5000- or 6000-level requirements for an advanced degree.

Special rules apply for courses completed within The University of Tennessee System.

Thesis Consultant
All theses and dissertations are submitted to the Graduate School Thesis Consultant for approval before they are officially accepted for the Graduate Council. A student may confer with the Thesis Consultant regarding any problems or questions encountered during the preparation of the final copy of the thesis or dissertation. Students should also consult the Graduate School Thesis and Dissertation Manual as a guide to the correct format for the thesis or dissertation.

Before a thesis is deposited in the Library, it is the responsibility of the Thesis Consultant to examine the materials and to make sure that the report is mechanically accurate and attractively presented, is free of technical errors in format, is suitable for binding and makes meaningful content to the University and its graduate program. If the form of the thesis is not thus approved, the student must make whatever corrections are necessary and submit the materials again.

A one-hour Thesis Workshop is held each fall quarter and each summer quarter for all interested students. The date for the Workshop is announced in the Graduate School News.

Requirements for Advanced Degrees

Master's Degrees
Master's degree programs offered in the Graduate School are listed under "Majors and Degrees Available" on pp 8-9. See also chart, p. 19 for summary of procedures for these degrees.

Non-Thesis Programs: Some departments offer optional non-thesis programs for the Master's degree. Departmental announcements indicate whether this option is available.

Course Requirements: A candidate for a Master's degree must present a total minimum credit of 45 quarter hours of approved graduate courses. These hours may be entirely in one major subject or may include one or two minors. If approved by the student's faculty advisory committee and the Vice Chancellor for Graduate Studies and Research. The major subject must include at least 18 quarter hours of credit of course work except in the MBA degree program. A minor shall consist of not less than nine or more than 18 quarter hours of course work.
All courses for which a student registers must be completed (unless officially dropped) before graduation. At least one-half of the courses required for the graduate program must be at or above the 5000-level, of which no more than nine hours may be thesis courses. These courses must be completed at The University of Tennessee. (5000- and 6000-numbered courses are open to graduate students only—3000- and 4000-numbered courses may be taken for graduate credit if listed in the Graduate School Catalog.)

The Master of Arts in College Teaching requires 60 quarter hours, nine hours of which must be devoted to the preparation of a thesis (some departments permit the student to take additional courses in lieu of a thesis—see individual requirements) and three hours of which will be comprised of a three-quarter, one credit-hour seminar in the principles and techniques of college teaching. In the two-year program, the candidate also spends six quarters as a teaching intern. The emphasis in the program will be on training prospective teachers of undergraduate courses. Participating departments are indicated in the list of "Majors and Degrees Available," p. 65.

Master's Committee: A committee for the Master's degree is formed at or before the time the student applies for admission to candidacy. The student should consult with the major professor concerning the composition of a committee. This committee consists of a minimum of three members, with the rank of assistant professor or above. If a student does not have a minor, all members may be from the major department. If a student does have a minor, one member of the committee must be from the minor department. A student should consult with the advisor or department head concerning the Master's committee after one quarter of graduate level work.

Admission to Candidacy: Application for admission to candidacy for the Master's degree is made after the student completes any required prerequisite courses and at least 15 hours of graduate course work with a B average (no incompletes) in all courses taken for graduate credit. Approval of the Vice Chancellor for Graduate Studies and Research is required. The student must submit the Admission to Candidacy form, with appropriate signatures, to the Graduate Office no later than commencement day of the quarter preceding the quarter in which he/she plans to graduate. The deadline for submission of this form is given each quarter in the Graduate School News.

Thesis Registration: A minimum of nine quarter hours and, in some approved programs, a maximum of 18 quarter hours of credit (course number 5000 which is variable credit) in the major may be earned in the preparation of an acceptable thesis, representing original, independent work. A student may register for a thesis course each quarter work is being pursued on the thesis. If the thesis is not completed during the quarter in which the student registers for the last three hours of 5000, the candidate shall continue to register for a minimum of three hours of 5000 each quarter while actually working on the research and thesis through the quarter in which the thesis is accepted by the Graduate School. Similar rules apply when problems are used in lieu of the thesis.

Non-Thesis Registration: All non-thesis students using University facilities or faculty time must be registered for course 5002 if not registered for other courses. Students taking the final examination but not otherwise registered must pay a fee of $50. Final exams will not be scheduled until one of the above is met.

Final Examination for Thesis Students: A candidate presenting a thesis must pass a final oral (or oral and written) examination on all work offered for the degree.

The examination is not merely a reexamination of course work, but it is a test of the candidate's ability to integrate material in the major and related fields, including the work presented in the thesis. This examination must be scheduled through the Graduate Office, shall be held at least one week before the final date for submission of theses to the Graduate School. The complete thesis, in a form acceptable to the major professor, shall be distributed to all committee members at least one week before the date of the final oral examination. This examination will be conducted by a committee of not fewer than three faculty members, with the student's major professor as chairman. (Members of the University faculty may attend the examination.) In case of failure of the final examination, the candidate may not appear for reexamination until the following quarter. The result of the second examination is final.

Final Examination for Non-Thesis Students: A non-thesis student must pass a final written examination on all work offered for the degree. The department may or may not follow this examination with an oral examination.

The examination is not merely a reexamination of course work, but it is a test of the candidate's ability to integrate material in the major and related fields. This examination must be scheduled through the Graduate Office in accordance with the Graduate School News deadlines. This examination will be conducted by a committee of not fewer than three faculty members, with the student's major professor as chairman. (Members of the University faculty may attend the examination.) In case of failure of the final examination, the candidate may not appear for reexamination until the following quarter. The result of the second examination is final.

Thesis: The thesis represents a culmination of an original research project completed by the student under the direction of a thesis advisor. The thesis is important in conveying to others the results of such research. Two copies of the thesis must be submitted to and approved by the Graduate School on or before the dates specified by the Graduate School. If a student is unable to meet this deadline, and the thesis is approved prior to the first day of registration for the next quarter, the candidate may then graduate the next quarter (or later) without being registered if properly registered for three hours of 5000 the quarter the thesis was accepted. Each copy of the thesis must include an approval sheet, signed by the members of the committee, which certifies to the Vice Chancellor for Graduate Studies and Research that the committee has examined the final copy of the thesis and found its contents to be satisfactory. The student should check with the department head concerning additional required copies of the thesis. The thesis must be prepared according to the Graduate School Thesis and Dissertation Manual.

Specialist In Education Degree

The Specialist in Education (Ed.S.) degree is offered in curriculum and instruction, educational administration and supervision, educational psychology and guidance, safety education and service, and vocational-technical education. Students in the Graduate School who become candidates for the Ed.S. must have a minimum of one year of teaching experience or its equivalent. Admission to the Specialist in Education program requires formal application for admission to Graduate School, followed by processing and recommendation by the department or area in which the student is majoring, and is dependent upon final approval by the Vice Chancellor for Graduate Studies and Research.

The formulation of the student's program, supervision of program development, recommendation for admission to degree candidacy, direction of research, and qualifying and final examinations are executed by a committee of not fewer than three faculty members. This committee is appointed upon request from the department head by the Vice Chancellor for Graduate Studies and Research, and shall include a minimum of two members from the department or area of specialization. See chart, p. 20 for summary of procedures for this degree.

Course Requirements: Each student's program involves a minimum of six quarters of study totaling not less than 90 quarter hours. A student's program of study is required to have at least one quarter of full-time residence. A student without a Master's degree is required to have two consecutive quarters of full-time residence. A minimum of 12 quarter hours from collateral fields in professional education (outside the major department or area) and 12 quarter hours from fields outside of the College of Education is required for each individual program.

Credits earned in a Master's degree may meet course requirements in the student's Specialist in Education program to which
### Summary of Procedures for Master's Degrees

#### PROCEDURE

<table>
<thead>
<tr>
<th>Under Direction of</th>
<th>Date</th>
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<tbody>
<tr>
<td>Admissions as a potential candidate (if previously admitted non-degree)</td>
<td>Prior to receiving 18 hours of course work</td>
</tr>
<tr>
<td>Submission of application for admission to candidacy (forms at Graduate Office)</td>
<td>B average, no I's, completed prerequisites, at least one quarter prior to graduation*</td>
</tr>
<tr>
<td>Approval of admission to candidacy</td>
<td>Prior to commencement</td>
</tr>
</tbody>
</table>

#### Graduation Requirements

<table>
<thead>
<tr>
<th>Under Direction of</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placement of name on graduation list</td>
<td>Indicate on registration material</td>
</tr>
<tr>
<td>Application for diploma</td>
<td>See deadline notice available at registration*</td>
</tr>
<tr>
<td>Scheduling of oral or written examination</td>
<td>Not later than one week prior to oral or written examination*</td>
</tr>
<tr>
<td>Submission of thesis to faculty committee</td>
<td>At least one week prior to oral or written examination</td>
</tr>
<tr>
<td>Oral examination</td>
<td>Not later than one week before thesis deadline*</td>
</tr>
<tr>
<td>Removal of incompletes</td>
<td>Not later than one week before Commencement*</td>
</tr>
<tr>
<td>Submission of final copy of thesis and thesis card</td>
<td>After oral examination and no later than two weeks before Commencement*</td>
</tr>
</tbody>
</table>

* Dates are printed in Graduate School News quarterly.

Undergraduate courses required for certification at The University of Tennessee in the student's field of specialization may not be taken for graduate credit as part of the program. At least 22 1/2 of the last 45 hours of course work, exclusive of the thesis or problems, must be in 5000- or 6000-level courses. The last 45 hours of a student's program (including thesis or problems) must be completed within six years.

**Admission to Candidacy:** Admission to candidacy is established by formal application to the Vice Chancellor for Graduate Studies and Research, normally during or immediately following the quarter in which the student's course credit totals or exceeds 45 hours and upon the recommendation of the student's committee. Approval of the Vice Chancellor for Graduate Studies and Research is required. The student must submit the Admission to Candidacy form, with appropriate signatures, to the Graduate Office no later than commencement day of the quarter preceding the quarter in which the student plans to graduate. A qualifying examination is required if the student's Master's degree was earned six or more years prior to admission to the program. The qualifying examination may be written, oral, or both written and oral.

**Thesis:** The thesis represents a culmination of an original research project completed by the student. The organization, method of presentation, and subject matter of the thesis are important in conveying to others the results of such research. A minimum of nine hours of research credit (5180, 5190, and 5200) is required. If the student does not complete the research during the first quarter registered for 5200, the student must continue to register for this course (minimum of three hours) each quarter as long as active work on the thesis continues or until the thesis is submitted and accepted.
is accepted by the Graduate School. The thesis is to be prepared according to the instructions in the Graduate School *Thesis and Dissertation Manual*. It should be approved by the committee prior to submission and must be submitted by the appropriate date the quarter the student wishes to graduate.

**Final Examination:** The final step in the program is an oral examination covering the student's research and course of study. This examination must be scheduled through the Graduate Office in accordance with the dates given in the *Graduate School News*. In case of failure, the student may not appear for reexamination until the following quarter. The result of the second examination is final.

**Doctor's Degrees**

Three doctoral degree programs are available: Doctor of Philosophy, Doctor of Education, and Doctor of Business Administration. Doctoral programs are listed under "Majors and Degrees Available" (see pages 8-9). The Doctor's degree, the highest in-course degree, is awarded in recognition of distinctive scholarship and the completion of a research project which is a significant contribution to knowledge.

Doctoral programs include a field of specialization and often study in one or more collateral fields. The selection of specific courses will be determined by each student's faculty committee, subject to regulations of the Graduate School and approval by the Vice Chancellor for Graduate Studies and Research. See chart, p. 22, for summary of procedures for this degree.

**Doctoral Committee:** The student's committee is nominated by the student's major professor and/or department head and approved by the Vice Chancellor for Graduate Studies and Research, usually at the beginning of the second year of graduate study. This committee shall consist of at least four members, with at least one member from outside the major department. Three of the four members, including the chairman, must be approved by the Graduate Council to direct doctoral research.

**Continuous Registration:** Registration for course 6000 is necessary whenever a student is working on the dissertation. A minimum registration of 36 quarter hours of course 6000 is required of all doctoral candidates before the dissertation will be accepted. The student will continuously register for course 6000 (minimum of three hours) from the time that the doctoral research proposal is approved, admission to candidacy is accepted, or registration for course 6000 is begun, whichever comes first, including the quarter in which the dissertation is accepted by the Graduate School. (NOTE: Continuous registration is interpreted to include the summer quarter.)

If a student must be away from the University during the doctoral study, the student may, upon recommendation of the department head and approval of the Vice Chancellor for Graduate Studies and Research, be granted a leave of absence from the requirement for periods not exceeding eight quarters.

**Preliminary Examination:** A comprehensive written preliminary examination which is an indication of the student's fitness for completing the program is required of each person working toward the doctorate. The nature and time of the examination will be determined by the student's major depart-

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**Summary of Procedures for Specialist in Education Degrees**

<table>
<thead>
<tr>
<th>PROCEDURE</th>
<th>UNDER DIRECTION OF</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission as a potential candidate (if previously admitted non-degree)</td>
<td>Major departmental advisor and Vice Chancellor for Graduate Studies and Research</td>
<td>After submission of Revision Form</td>
</tr>
<tr>
<td>Submission of application for admission to candidacy (obtain forms from the Graduate Office)</td>
<td>Major professor and Vice Chancellor for Graduate Studies and Research</td>
<td>At least one quarter prior to graduation*</td>
</tr>
<tr>
<td>Approval of admission to candidacy</td>
<td>Vice Chancellor for Graduate Studies and Research</td>
<td>Prior to Commencement</td>
</tr>
</tbody>
</table>

**GRADUATION REQUIREMENTS**

<table>
<thead>
<tr>
<th>PROCEDURE</th>
<th>DIRECTION OF</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placement of name on graduation list</td>
<td>Student</td>
<td>Indicate on registration material</td>
</tr>
<tr>
<td>Application for diploma</td>
<td>Vice Chancellor for Graduate Studies and Research</td>
<td>See deadline notice available at registration*</td>
</tr>
<tr>
<td>Scheduling of oral or written examination</td>
<td>Major professor, Vice Chancellor for Graduate Studies and Research, and student</td>
<td>Not later than one week prior to oral or written examination*</td>
</tr>
<tr>
<td>Submission of thesis or problems to faculty committee</td>
<td>Faculty committee</td>
<td>At least one week prior to oral examination</td>
</tr>
<tr>
<td>Oral examination</td>
<td>Major professor and committee</td>
<td>Not later than one week prior to thesis/problems deadline*</td>
</tr>
<tr>
<td>Removal of incompletes</td>
<td>Instructor of course</td>
<td>Not later than one week before Commencement*</td>
</tr>
<tr>
<td>Submission of final copy of thesis and thesis card</td>
<td>Major professor, candidate’s committee, and Vice Chancellor for Graduate Studies and Research</td>
<td>After oral examination and no later than two weeks before Commencement*</td>
</tr>
</tbody>
</table>

* Dates are printed in *Graduate School News* quarterly.
ment of faculty committee. The preliminary examination must be passed prior to admission to candidacy and at least three quarters in advance of conferment of the degree. The doctoral program must be completed within a period of five years after passage of preliminary examinations.

Language Requirements: Usually candidates for the Ph.D. degree must possess a reading knowledge of at least one foreign language in which there exists a significant body of literature relevant to their major field of study. Some programs require two languages and some none. Language requirements must be met at The University of Tennessee and cannot be transferred from another institution. Refer to the departmental descriptions of each Ph.D. program. The student's faculty committee will determine, with the approval of the Vice Chancellor for Graduate Studies and Research, the specific language(s) required. When the student feels adequately prepared to take a language examination, he or she should notify the language representative in the department. The appropriate forms to schedule the examination may be obtained from the Graduate Office. The dates and times of the examinations are printed in the Graduate School News.

Satisfactory completion (B grade or better) of an appropriate 3030 course in a language department may be substituted for the actual language examination. (The student cannot repeat this course if a grade of C or below is received when used in lieu of language examination.)

Admission to Candidacy: A student may be admitted to candidacy after passage of the preliminary examinations, fulfillment of the language requirements (for Ph.D.), and maintenance of at least a B average in the courses. (Each doctoral student must plan to take an appropriate number of 6000-level courses, usually a minimum of nine quarter hours, which are designed expressly for doctoral students at The University of Tennessee, during the program of study. These courses cannot be transferred from another institution.) Admission to candidacy must be secured at least three quarters prior to the date the degree is to be conferred. Each student is responsible for filing the application for admission to candidacy, which must be signed by the committee members and approved by the Vice Chancellor for Graduate Studies and Research. The student will be notified when admission to candidacy has been approved.

Research Requirements: Research is an essential part of the program of every candidate for the Doctor's degree. For the Doctor of Philosophy and Doctor of Business Administration degrees, original research forms the basis of the dissertation. The program for the Doctor of Education degree requires demonstration of proficiency in at least two types of research techniques. These techniques may include foreign languages, historical research methods, statistics, experimental design, sociological research methods, survey design and analysis, philosophical research methods, or machine data processing. The candidate's faculty committee shall determine the research techniques to be included in the candidate's program.

Final Examination: A final examination (oral, written) on the student's dissertation, special field, and such other fields as the student's faculty committee may specify, will be administered by the full, approved committee after completion of the dissertation and all course requirements. This examination must be passed at least one week before the date for submission of the dissertation to the Graduate Office. The examination must be scheduled through the Graduate Office and oral 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 date of the examination is announced publicly and the examination is open to all faculty members.

Dissertation: The dissertation represents a culmination of an original major research project completed by the student. The dissertation must be written in English and be a complete, original scholarly work. The organization, method of presentation, and subject matter of the dissertation are important in conveying to others the results of such major research. A student should be registered for the number of dissertation hours representing the appropriate fraction of effort devoted to this phase of the candidate's program. A minimum registration of 36 quarter hours of course 6000 is required of all doctoral candidates before the dissertation will be accepted. The student shall continue to register for course 6000 (minimum of three hours) for the entire period during which the person is actually working on research and dissertation, including the quarter in which the dissertation is accepted by the Graduate School. Two copies of the dissertation (prepared according to the regulations given in the Graduate School Thesis and Dissertation Manual) must be submitted to and approved by the Graduate School. These copies must include an approval sheet, signed by all members of the faculty committee, which certifies to the Vice Chancellor for Graduate Studies and Research that they have examined the final copy and found its contents to be satisfactory. 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.
### Summary of Procedures for Doctoral Degrees

<table>
<thead>
<tr>
<th>PROCEDURE</th>
<th>UNDER DIRECTION OF</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Preliminary examination</em></td>
<td>Major department</td>
<td>Prior to admission to candidacy</td>
</tr>
<tr>
<td><em>Foreign language examination(s)</em>**</td>
<td>Major department and language department jointly</td>
<td>Prior to admission to candidacy</td>
</tr>
<tr>
<td><em>Appointment of faculty committee</em></td>
<td>Vice Chancellor for Graduate Studies and Research</td>
<td>Prior to admission to candidacy</td>
</tr>
<tr>
<td>Approval of admission to candidacy (obtain blanks from Graduate Office)</td>
<td>Faculty committee and Vice Chancellor for Graduate Studies and Research</td>
<td>At least three quarters prior to graduation</td>
</tr>
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## GRADUATION REQUIREMENTS

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Responsible Party</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placement of name on graduation list</td>
<td>Student</td>
<td>Indicate on registration material</td>
</tr>
<tr>
<td>Application for diploma</td>
<td>Vice Chancellor for Graduate Studies and Research</td>
<td>See deadline notice available at registration**</td>
</tr>
<tr>
<td>Scheduling of oral examination</td>
<td>Faculty committee and Vice Chancellor for Graduate Studies and Research</td>
<td>When approved by faculty committee and at least one week prior to oral examination**</td>
</tr>
<tr>
<td>Submission of dissertation to faculty committee</td>
<td>Faculty committee</td>
<td>At least two weeks prior to oral examination</td>
</tr>
<tr>
<td>Oral examination</td>
<td>Faculty committee</td>
<td>Not later than one week before dissertation deadline**</td>
</tr>
<tr>
<td>Removal of incompletes</td>
<td>Instructor of course</td>
<td>Not later than one week before Commencement**</td>
</tr>
<tr>
<td>Submission of final copy of dissertation, doctoral forms, and thesis card.</td>
<td>Faculty committee and Vice Chancellor for Graduate Studies and Research</td>
<td>After oral examination and at least two weeks before Commencement**</td>
</tr>
</tbody>
</table>

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* The order of these items varies with individual programs.
* * Dates are printed in Graduate School News quarterly.
*** Not required in some programs.
The Institute of Agriculture traces its history to 1869 when the University was designated as Tennessee's Federal Land-Grant Institution. Under terms of the Federal Land-Grant Act, the University was enabled to offer instruction in agriculture and the mechanic arts for the first time. Since 1869, agricultural programs at the University have been expanded to include research for the development of new knowledge and extension for dissemination of such knowledge to rural people. Thus the Institute of Agriculture has come to include the work of three main divisions: College of Agriculture, Agricultural Experiment Station, and Agricultural Extension Service.

In March 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. The first students were admitted in the fall of 1976.

**Agricultural Experiment Station**

D. M. Gossett, Dean  
Thomas J. Whatley, Associate Dean

The Agricultural Experiment Station was established by the University's Board of Trustees on June 8, 1882, which was five years before the passage of the Hatch Experiment Station Act by the U.S. Congress. The University was one of the first five institutions in the U.S. to establish an Agricultural Experiment Station. Since its beginning the Station has given first attention to investigations of concern to the agriculture of Tennessee. The investigations of the Station follow a systematic method of gaining and applying knowledge efficiently to the biological, physical, and economic phases of producing, processing, and distributing farm and forest products; to the social and economic aspects of rural living; and to consumer health and nutrition. Both farm and urban populations gain from the accomplishments of the Agricultural Experiment Station. Examples of some of these accomplishments are new and improved varieties of crops, new and better methods of controlling crop and livestock pests, more efficient production of crops and pastures through improved fertilization and mechanization, and more efficient feeding and management of livestock.

The program is designed and administered through 16 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, Spring Hill, Springfield, Lewisburg, Crossville, Greeneville, and Martin. In addition, field stations are operated at Grand Junction, Milan, Wartburg, Tullahoma, and near Chattanooga. Professional and technical staff are in residence at these locations.

The UT-ERDA Comparative Animal Research Laboratory is located about 20 miles west of Knoxville near Oak Ridge, where a program of radiobiological research in the field of agriculture is carried out by the Agricultural Experiment Station under contract to the Energy Research and Development Administration. The program includes research with farm and laboratory animals, with soils, and in applied radiobiology and plant breeding.

**Agricultural Extension Service**

W. D. Bishop, Dean  
M. L. Downen, Assistant Dean  
T. W. Hinton, Assistant Dean  
Mildred F. Clarke, 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. Education emphasis includes work in five major program areas: agricultural production, marketing of agricultural products, development and conservation of natural resources, 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 informational 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 three 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, teaching, research, and extension. The College of Agriculture represents county government in this partnership.

College of Agriculture
O. Glen Hall, Dean

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

MASTER OF SCIENCE PROGRAMS

Programs of graduate study leading to the Master of Science degree are offered through all departments in the College of Agriculture. The general rules of the Graduate School apply to all graduate work in this college. The graduate program may be entirely in one major subject or may include one or two minors in any of the subject matter areas related to the major.

Both majors and minors are available in agricultural biology, agricultural economics, agricultural engineering, agricultural extension education, agricultural mechanization, animal science, food technology, ornamental horticulture and landscape design, and plant and soil science. Majors only are available in forestry and wildlife and fisheries science, and minors are available in general agriculture and rural sociology. The minor in general agriculture requires 18 hours of course work.

A complete listing of majors is shown on pages 8-5.

For admission to a graduate degree program, the student must have a satisfactory academic average and have completed the substantial requirements for an undergraduate major in his/her field of study or have completed sufficient undergraduate work in related areas to satisfy the department that he/she can successfully pursue graduate study in the chosen field. Prerequisite courses may be required when the student's preparation is deemed to be inadequate.

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

Normally, graduate programs will include the thesis requirement. There are, however, two exceptions. In a program involving a major and two minors, or one involving a minor in general agriculture, the research requirement may be met by three special problems in lieu of thesis. This program is provided to meet the needs of those working in fields of agriculture where general training is suitable rather than the more specialized subject-matter programs which usually characterize graduate study. The special problems in lieu of thesis must represent at least two of the fields of study selected. A student should have completed at least six hours of graduate work in a subject before pursuing a special problem in lieu of thesis in that field. Problems in lieu of thesis will be written to meet normal thesis standards of quality.

A non-thesis option is offered in the Department of Agricultural Economics and Rural Sociology in addition to the thesis option and has the following minimum requirements:

- 48 hours of course work of which 24 must be at the 5000-level.
- 18 hours in agricultural economics.
- 9 hours of economic theory.
- 6 hours in quantitative methods in agricultural economics, statistics, or mathematical economics.

Final comprehensive written and oral examination.

DOCTORAL PROGRAMS

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

General Graduate School requirements relative to admission, faculty advisory committees, residence, grades, research, and admission to candidacy for degree apply to all doctoral programs. Special departmental requirements are listed in the following paragraphs.

Agricultural Economics and Rural Sociology

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

A. A major area of concentration to be selected from the following:

1. General agricultural economics
2. Agricultural marketing and price analysis
3. Farm management and production economics
4. Economics of agricultural development

B. The Core Areas:

1. Agricultural economics
2. Economic theory
3. Mathematical and quantitative methods in agricultural economics

Course Requirements: A minimum of 108 quarter hours credit beyond the Bachelor's degree, exclusive of credit for Master's research, is required in the doctoral program. Of this total, 36 hours in doctoral research and 15 hours in economics are required. At least 30 hours of course work shall be in agricultural economics and 15 hours in economics. Excluding the dissertation, a minimum of 21 hours in agricultural economics and 36 hours in agricultural economics and economics combined must be in courses numbered 5000 and above.

Agricultural Engineering

Candidates pursuing the Doctor of Philosophy degree in Agricultural Engineering may specialize in one of the following areas:

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

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

Additional course requirements for the degree are:

1. Minimum of 108 quarter hours credit beyond the Bachelor's degree, exclusive of the credit for the Master's thesis. Of this number, students are required to complete a minimum of 36 quarter hours in 6000 Doctoral Research and Dissertation.
2. A minimum of 30 quarter hours credit will be in courses numbered 5000 and 6000, exclusive of Doctoral Research and Dissertation.
3. The program of each candidate shall consist of a major and supporting studies in one or more additional areas. The major shall consist of a minimum of 24 quarter hours excluding research and dissertation. A minimum of 24 quarter hours shall be taken in departments outside of the Department of Agricultural Engineering.
4. The specific program of a candidate for the degree of Doctor of Philosophy in Agricultural Engineering will depend upon the interest and previous training of the candidate. Each candidate will be under the immediate supervision of a faculty advisory committee in planning his/her program. The major professor will serve as chairman of the faculty advisory committee and will direct the research and preparation of the dissertation.

Animal Science

The Department of Animal Science, with support from the Department of Food, Technology and Science, offers programs leading to the Doctor of Philosophy degree in the following areas of specialization:

1. Animal nutrition
2. Animal breeding
3. Animal physiology
4. Animal production engineering

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

Additional specific course requirements for the degree of Doctor of Philosophy in Animal Science include:

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

2. At least 36 quarter hours credit in courses numbered 5000 and 6000, exclusive of Doctoral Research and Dissertation.

3. A minimum of 24 quarter hours credit must be completed in related fields outside of animal science.

The specific program of a candidate for the degree of Doctor of Philosophy in Animal Science depends upon the interest and previous training of the candidate. Actual course content of the program is planned with each student in consultation with a faculty advisory committee to meet requirements in the various areas of concentration.

Plant and Soil Science

The Department of Plant and Soil Science offers programs leading to the Doctor of Philosophy degree in the following areas of specialization:

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

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

Some of the specific requirements for the degree are:

1. Minimum of 108 quarter hours credit beyond the Bachelor's degree exclusive of Master's thesis. Of this number, students are required to complete a minimum of 36 quarter hours in Doctoral Research and Dissertation.

2. Minimum of 30 quarter hours credit in courses numbered 5000 and 6000 exclusive of Doctoral Research and Dissertation.

The specific program of a candidate for the degree of Doctor of Philosophy in Plant and Soil Science will depend upon the interest and previous training of the candidate. The program of courses and research will be planned with the student in consultation with a faculty advisory committee. The major professor will serve as chairman of the faculty advisory committee and will direct the research and the preparation of the dissertation.

Departments of Instruction

Numbers in parentheses following the course titles indicate quarter hours credit offered.

Agricultural Biology

MAJOR  DEGREE

Agricultural Biology  M.S.

Professors:
C. J. Southards (Head), Ph.D. North Carolina State; J. W. Reed, Ph.D. Ohio State; L. F. Johnson, Ph.D. Louisiana State.

Associate Professors:
C. D. Pies, Ph.D. Clemson; H. E. Reed, Ph.D. Ohio State; J. L. Wilson, Ph.D. Tennessee.

Assistant Professors:
R. Garhardt, Ph.D. North Carolina State; P. L. Lambdin, Ph.D. VIP and SU.

3130 Introductory Plant Pathology (4) Principles of plant pathology illustrated by diseases of common agricultural crop plants. Prereq: Introductory botany or zoology. Graduate credit for non-majors only. 3 hrs and 1 lab.

3210 Economic Entomology (4) Structure, life history, habits, and principles of control of important insect pests of farm, garden, orchard, and household. 3 hrs and 1 lab.

3220 Apiculture (3) Biology of the honey bee, with emphasis on beekeeping equipment and apiary management practices relative to pollination of crops and production of honey and beeswax. 2 hrs and 1 lab.

4010 Biology of Soil Microorganisms (4) A study of the morphology and physiology of soil organisms, decomposition of organic matter, chemical transformations, and interactions between soil organisms and higher plants. Prereq: Introductory microbiology or 3130. 3 hrs and 1 lab.

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

5000 Thesis

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

5210 Plant Parasitic Nematodes (4) Morphology, physiology, taxonomy, and ecology of plant parasitic nematodes with emphasis on host-parasite relationships. Prereq: 8 hrs biological science or consent of instructor. 2 hrs and 2 labs. (Same as Zoology 5210).

5220 Plant Disease Control (3) Basic problems and principles involved in controlling plant diseases. Prereq: 3150.

5230 Field Crop and Vegetable Insects (3) Taxonomy, biology, and control of insects affecting field and vegetable crops. Prereq: 3210 or equivalent course in applied entomology, 2 hrs and 1 lab.

5240 Insect Pests of Man and Animal (3) A study of the taxonomy, biology and control of those insects parasitic on domestic animals and those found in human habitation. Prereq: 3210 or equivalent course in applied entomology. 2 hrs and 1 lab.

5260 Insect Pest Management (4) Principles and applications of biological, cultural, genetic, behavioral, and chemical methods of control to maintain pest populations below economic threshold levels. Prereq: 3210, Zoology 3110, or consent of instructor. 3 hrs and 1 lab.

5310 Special Problems in Plant Pathology or Economic Entomology (1-6) Comprehensive individual study of current problems in economic entomology or plant pathology. May be repeated. Maximum 9 hrs.

5410 Seminar (1) Review of literature and current research in plant pathology and economic entomology. May be repeated. Maximum 3 hrs.

Agricultural Economics and Rural Sociology

MAJOR  DEGREES

Agricultural Economics  M.S., Ph.D.

Professors:
J. A. Martin (Head), Ph.D. Minnesota; M. B. Badenhop, Ph.D. Purdue; D. W. Brown, Ph.D. Iowa State; C. L. Cleveland, Ph.D. Wisconsin; I. Dubov, Ph.D. California (Berkeley); L. H. Keller, Ph.D. Kentucky; F. O. Leuchthold, Ph.D. Wisconsin.

Associate Professors:
J. R. Brooker, Ph.D. Florida; C. M. Cuskaden, Ph.D. Michigan State; B. J. Deaton, Ph.D. Wisconsin; T. H. Kinfeld, Ph.D. Kentucky; B. R. McManus, Ph.D. Purdue; S. D. Mundy, Ph.D. Tennessee; C. B. Sappington, Ph.D. Illinois; J. G. Steil, Ph.D. Michigan State; B. J. Trevena, Ph.D. Tennessee.

Assistant Professor:
R. H. Orr, Ph.D. Illinois.

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

Agricultural Economics

3120 Agricultural Prices (3) Factors determining prices of farm products. Effects on prices of varying degrees of competition, government procurement, monopolies, information on prices and related market data. Uses of price information and techniques of analysis in determining outlook for farm prices.

3320 Marketing Farm Products (3) American marketing system; alternative structures; functions and commodity marketing problems. Marketing problems and possibilities for improvement. Graduate credit for non-majors only.

3710 Consumer Demand for Agricultural Products (3) Economic principles, marketing practices and consumer behavior as related to the demand for agricultural products. Evaluation of advertising and other related information. Prereq: Introduction to Social Science for Agriculture and 2nd quarter of Introductory Economics. Graduate credit for non-majors only.

4120 Farm Management (3) Principles of farm organization and operation. Allocating land, labor, and capital to meet changing technologies. Tenure arrangements and use of credit. Risks. Measures of success. Use of records and analysis of performances. Practice in planning nearby farms. Field trips will be arranged. 2 hrs and 1 lab.

4140 Introduction to Agricultural Production Economics (3) Resource allocation, product selection, scale of operation of individual farms, aggregate effects of decisions made by individual agricultural firms.

4210 Problems in Agricultural Economics (3) Supervised laboratory course in instruction, methods of collecting, analyzing information, and in writing a report. May be repeated. Maximum 9 hrs.

4240 World Agriculture and Trade (3) Economic bases of world agricultural production and trade patterns. Resources location land tenure systems, international trade and commercial policy in determining agricultural production and trade patterns. Prereq: Consent of instructor.

Institute of Agriculture 25
26 Institute of Agriculture

4630 Advanced Agricultural Marketing (3) Topics of production and costs. Application of cost theory to the production organization of the marketing firm and problems of plant operation. Market organization, structures, and price policies. Application of imperfect competition theory to the market policies of agricultural processing and merchandising firms.

4710 Agricultural Law (4) Survey of law and application to the farmer, his family and the agricultural industry. Property, contracts, torts, drainage and water rights, landlord-tenant relationships, taxation and insurance, forms of business organization, estate planning, regulatory laws and other selected topics.

5000 Thesis

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

5011 Special Problems in Lieu of Thesis (3)

5120 Agricultural Price Analysis (3) Analysis and interpretation of factors affecting agricultural prices; price trends and cycles; application of economic theory and statistical techniques to agricultural price research. Prereq: 3120 and Statistics 4310 or equivalent.

5130 Advanced Agricultural Production Economics (3) Application of empirical concepts of agricultural resource allocation problems under conditions of uncertainty. Prereq: 4140 or equivalent.

5210 Seminar: Agricultural Policies (3)

5220 Seminar: Methodology of Research (3)

5230 Seminar: Adjustments to Industrialization (3)

5310 Research (3) Special research problems in agricultural economics and rural sociology. Graduate students present work and integrate data and report writing. May be repeated. Maximum 9 hrs.

5410 Agricultural Marketing Analysis (3) Application of tools of economic analysis and measurement to problems at all levels of the marketing system for agricultural commodities. Prereq: 4630 or equivalent.

5420 Advanced Land Economics (3) Problems in land tenure, land use, and conservation in the United States and selected foreign countries. Prereq: 4530 or equivalent.

5440 The Economics of Agricultural Development (3) Role of agriculture in overall economic development; the economic nature of traditional agriculture; and the analysis of causal forces and empirical interdependence of agricultural development under conditions of economic change. Prereq: 4240 or consent of instructor.

5610 Quantitative Methods in Agricultural Economics (3) Study of analytical techniques useful in estimation of functions—supply, demand and production—and prediction of economic variables. Emphasis on the application of multiple regression: model specification, estimation technique using computer and interpretation of results. Prereq: Statistics 4510 or Economics 5510 or consent of instructor.

5710 Quantitative Methods in Agricultural Economics (3) Study of linear programming technique with empirical applications, made to problems of maximizing profit, minimizing cost, firm growth, transportation, and location. Other topics include input-output analysis, recursive programming, game theory, and nonlinear programming. Prereq: Economics 4180 or consent of instructor.

6000 Doctoral Research and Dissertation

6120-30 Seminars in Agricultural Economics (3, 3) Topics will be selected from the areas of economics of production, consumption or distribution in agricultural and related industries and public policies concerned with agriculture and related industries.

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

6410 Agricultural Supply Analysis (3) Estimating agricultural supply relationships using aggregate time series regression, production functions, linear programming, simulation and firm growth models with emphasis on correspondence between theoretical concepts and model attributes. Prereq: 5130 or consent of instructor.

6420 Marketing and Resource Use (3) Institutional settings for research and policy formulation. Analytical tools to measure efficiency of use and decision-making. Emerging problems in marketing and resource use. Wastes management in the marketing systems to conserve resources and environment. Prereq: 5410 or consent of instructor.

Rural Sociology

3420 An Introduction to Rural Sociology (3) Nature of rural society; social systems concept; rural-urban differences; nature of social relationships; social statistics and movement; problems of rural people; tenancy, farm labor, health, services, educational facilities, churches, local government; impact of industrialization.

4450 Diffusion of Agricultural Technology (3) Analysis of the diffusion process whereby new technology spreads from scientists to final adopters. An application of social science to adoption process, communication behavior, mass media, role of professional change agents, opinion leadership, and two-step flow hypothesis. Prereq: 3420 or consent of instructor.

5340 Special Problems (3) Special topics in rural sociology. Prereq: 3420 or consent of instructor. May be repeated. Maximum 9 hrs.

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

5450 Advanced Rural Sociology (3) The application of sociological concepts to analyzing the changing structure and function of rural life; rural social values, attitudes, and norms as they influence the roles of various social groups; population shifts and changing farm technology. Prereq: 3420 or equivalent.

5470 Research Problems in Rural Communities (3) Emphasis given to problems that arise in survey research in rural areas. Problems arising from sampling procedures, questionnaire construction, interviewer selection, training, and control, and legitimization needs are covered. Prereq: Undergraduate course in statistics.

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

Agricultural Engineering

MAJORS

DEGREES

Agricultural Engineering

M.S., Ph.D.

Agribusiness Management

M.S.

Professors:

D. H. Luttrell (Head), Ph.D., Iowa State;
J. I. Sewell (Assoc. Head), Ph.D., North Carolina State, P.E.; B. L. Bledsoe, Ph.D., Oklahoma State; J. J. M. Dow, Ph.D., Michigan State, P.E.

Associate Professors:

Z. H. Hurst, Ph.D., North Carolina State, P.E.;
C. H. Shellen, M.S., Virginia Polytechnic Institute; L. R. Wilhite, Ph.D., Pennsylvania, P.E.

Assistant Professors:

D. O. Baxter, M.S., Missouri; F. D. Tompkins, Ph.D., Pennsylvania.

Professional Agricultural Engineering

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

4610 Design of Water Control and Waste Utilization Systems (3) Design of water control and waste utilization systems including earth dams, irrigation, drainage, land grading, hydraulic transport of wastes, and application of wastes on agricultural land. Prereq: 3610 or permission of instructor. 1 hr and 2 labs.

4620 Design of Structures for Production, Processing and Environmental Control (3) Functional planning and structural design of agricultural buildings; emphasis placed on complete design of structure or system; design to include functional, structural and environmental aspects. 1 hr and 2 labs.

4630 Design of Processors and Materials Handling Systems (3) Design of systems and components for integrated agricultural processing to conserve mass and energy balances, product characteristics, equipment specifications, storage, handling and economic merit. Prereq: 3630. 1 hr and 2 labs.

4640 Design of Agricultural Machinery (3) Functional design requirements of agricultural machinery. Elements of machine component design: synthesis of mechanisms, mechanical and hydraulic drives. Team effort in completing design project. Prereq: 3040 or permission of instructor. 1 hr and 2 labs.

5000 Thesis
5240 Environmental Control in Agricultural Structures (3) Engineering approach to problems involving water surplus, deficiency and time distribution as related to agricultural and forest purposes. Prereq: Drainage and Irrigation, and Water Resources 3330 or consent of instructor.

5340 Hydrology of Agricultural and Forest Lands (3) Analytical approach to problems involving water surplus, deficiency and time distribution as related to agricultural and forest purposes. Prereq: Drainage and Irrigation, and Water Resources 3330 or consent of instructor. 2 hrs and 1 lab. (Same as Water Resources Development 5340)

5440 Instrumentation in Agricultural Systems (3) Analysis of specific instrumentation needs in agricultural industry and research problems; principles and design in utilization of special hardware instrumentation. Prereq: Electrical Engineering 3120 and Differential Equations or consent of instructor. 2 hrs and 1 lab.

5540 Engineering Properties of Agricultural Materials and Products (3) Fundamental engineering properties of agricultural products and materials as related to their handling, processing, and utilization. Prereq: 5440 and Mechanics of Materials. 2 hrs and 1 lab.

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

5710-20 Similitude in Design and Research (3, 3) Dimensional analysis in the development of models; theory and types of models; prediction equations; interpretation of data; applications to machinery, soil and water structures, agricultural buildings, and other agricultural engineering related problems. Prereq: 5440. Fluid Mechanics; and Mechanics of Materials. 2 hrs and 1 lab.

6000 Doctoral Research and Dissertation

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

6310 Engineering Systems Analysis in Agriculture (3) Systems approach to the design of engineering experiments and applications to included computer applications, statistical evaluations, and feedback control in agricultural problems. Prereq: 5440. Mathematics 4710; Agricultural Plant and Soil Science 5310; or 6 hrs of approved statistics. 2 hrs and 1 lab.

6510 Selected Topics in Agricultural Engineering (3) Lecture, group discussion, and individual study on specialized developments in power and machinery, soil and water structures, and processing. May be repeated. Maximum 9 hrs.

Agricultural Mechanization

3210 Soil and Water Conservation Facilities (3) Leveling, topographic surveying, planning, construction, and maintenance of drainage, irrigation, and erosion-control systems. Prereq: Introduction to Agricultural Engineering; General Mathematics; Soilia. 2 hrs and 1 lab.

3220 Agricultural Structures (3) Functional planning of structures; environmental control construction methods, properties of building materials, and cost estimation. Prereq: Introduction to Agricultural Engineering; General Mathematics (8 hrs). 2 hrs and 1 lab.

3510 Agricultural Utilities and Processing Equipment (4) Electrical equipment; controls, water and waste, handling of soil and water materials; waste disposal systems. Prereq: Introduction to Agricultural Engineering; Introductory Physics (8 hrs). 3 hrs and 1 lab.

4160 Agricultural Waste Utilization and Disposal (3) Technological aspects of agricultural wastes for utilizing, treating, and disposing of agricultural wastes by land spreading, lagooning, and processing. 2 hrs and 1 lab.

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

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

4210 Agricultural Machinery and Tractors (4) Agricultural machinery and power units; adaptation to agricultural practices; field efficiencies, capacities, adjustment and servicing. Prereq: Introduction to Agricultural Engineering; General Mathematics (6 hrs). 3 hrs and 1 lab.

5000 Thesis

5110 Research Problems in Agricultural Mechanization (3) Research problems related to recent developments and current practices in agricultural mechanization. May be repeated. Maximum 9 hrs.

5210 Electro-Mechanical Systems in Agriculture (3) Integration of electric power, mechanical equipment, structures, and environmental systems to plant and animal production, crop processing, and materials handling. Prereq: 3220 and 3510. 2 hrs and 1 lab.

5410 Agricultural Machinery Systems Analysis (3) Analysis of current field machinery; adaptation planning for new and old operations; machinery for unique and alternate production and harvesting systems; operational management. Prereq: 4110. 2 hrs and 1 lab.

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

Agricultural Extension Education

MAJOR

Teacher: R. S. Dotson (Head), Ph.D. Pennsylvania State

Associate Professor: C. E. Carter, Jr., Ph.D. Ohio State.

3110 Introduction to Agricultural Extension (3) History; philosophy; organization; teaching methods; relationships with other educational agencies. Graduate credit for non-majors only.

4110-20 Field Studies (3, 3) Supervised work experience with county extension agents in a designated county. Prereq: 3110, and permission of instructor. Requires living off-campus for a specified time.

5000 Thesis

5011-21 Special Problems in Lieu of Thesis (3, 3)

5100 Special Problems in Agricultural Extension (1-6) May be repeated. Maximum 9 hrs.

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

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

5230 Evaluation in Programs of Agricultural Extension (3) Principles, instruments, and techniques of identifying, gathering, analyzing, and using data to appraise planning and teaching and to determine progress of clientele. Prereq: 5210 or consent of instructor.

5310 History, Philosophy and Objectives (3) Historical and philosophical foundation of informal Adult Education in American Agriculture from the Agricultural Societies (1785 to present) with attention to key figures, issues, legislative movements, farmer organizations and programs. Emphasis on Agricultural Extension Service, its origin, legislation and growth and the nature of present day objectives and programs. Prereq: 3110 or consent of instructor.

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

5330 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 management. Prereq: 5210 or 5220 or consent of instructor.

Animal Science

DEGREES

MAJOR

Teacher: R. R. Johnson (Head), Ph.D. Ohio State; M. C. Bell, Ph.D. Oklahoma State; J. K. Bletner, Ph.D. Ohio State; C. C. Chamberlain, Ph.D. Iowa State; H. M. Jamison, Ph.D. Tennessee; J. B. McLaren, Ph.D. Auburn; G. M. Merriman, D.V.M. Michigan State; J. G. Montgomery, Ph.D. Wisconsin; R. L. Murphee, Ph.D. Wisconsin; D. O. Richardson, Ph.D. Ohio State; G. W. Schleien, Ph.D. Illinois; R. L. Shrode, Ph.D. Iowa State; E. W. Swanston, Ph.D. Missouri; R. L. Tugwell, Ph.D. Kansas State.


Assistant Professors: J. A. Corricken, Ph.D. Tennessee; D. C. Doyle, D.V.M.; Ph.D. Cornell; J. P. Hitchcock, Ph.D. Michigan State; J. W. Hollway, Ph.D. Oklahoma State; F. B. Masmup, Ph.D. Kansas State; J. G. Marden, Ph.D. Purdue; M. Sims, Ph.D. Auburn; J. D. Smalling, Ph.D. Texas A & M.

3210 Anatomy and Physiology of Farm Animals (4) Skeletal and joints, skeletal muscles, blood and microcirculation, and the nervous, cardiovascular, respiratory, digestive, renal and endocrine systems; demonstrations of physiochemical phenomena; organ systems; animal behavior, with attention to development of internal and external architecture. Prereq: 3220 Physiology of Reproduction (3) Comparative anatomy and physiology of the reproductive systems of selected vertebrates; gametogenesis, fertilization, implantation, prenatal
growth, parturition and initiation of lactation; endocrine regulation of reproductive phenomena. 2 hrs and 1 lab. (Same as Zoology 3220.)

3320 Animal Nutrition (3) Properties, functions, utilization and deficiency symptoms of essential nutrients; their value determination and their use. Prereq: Animal Science for Agriculture and one quarter of organic chemistry. 2 hrs and 1 lab.

3330 Feeds and Ration Formulation (3) Feedstuffs, additives, feeding standards; nutrient requirements and ration formulation for beef and dairy cattle, swine, poultry, and laboratory animals. Prereq: 3320. 2 hrs and 1 lab.

3410 Heredity in Animals (3) Basic chromosomal mechanism of heredity with emphasis on Mendelian principles and exceptions to these such as linkage and cycloplastic inheritance. Introduction to the biochemical basis of heredity and to quantitative inheritance. Illustrations of principles with examples in species with which students in agriculture are familiar. Prereq: Animal Science for Agriculture. 2 hrs and 1 lab.

3420 Principles of Animal Breeding (3) Genetic basis of variation, selection, and improvement of economically important species. Genetic basis of variation. Partitioning of variation according to various kinds of causative difference in genetic makeup and in environment. Selection and its consequences. Mating systems and their effects on populations under various systems of management. Prereq: 3410 or equivalent. 2 hrs and 1 lab.

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

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

3810 Nutrition and Management of Laboratory Animals (3) Principles of feeding, breeding and handling of animals in scientific investigations; specific species' requirements, peculiarities and research for which best fitted; laws governing use and handling of laboratory animals. Prereq: Zoology 3220 or permission of instructor. 2 hrs and 1 lab.

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

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

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

4310 Feeding Systems for Ruminants and Horses (3) Nutrition and feeding principles in the feeding of farm animals. Evaluation of feeding systems utilized during the life cycle of cattle, horses and sheep. Prereq: 3320. 2 hrs and 1 lab.

4320 Feeding Systems for Poultry and Swine (3) Nutrition and feeding principles in the comparison of feeding systems utilized during the life cycle of poultry and swine. Laboratory feeding trials, diet composition, feeding and metabolic concepts. Prereq: 3320. 2 hrs and 1 lab.

4410 Applied Animal Breeding (3) The principles studied in 3420 (breeding of important classes and species). Team taught by specialists in the breeding of dairy cattle, meat animals and poultry. Prereq: 3420. 2 hrs and 1 lab.

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

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

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

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

4850 Light Horse Production and Management (3) Integration of principles of nutrition, physiology, and breeding into a light horse management program. Structure of the industry, systems of production and production practices; individual animal and herd improvement programs; tack, equipment and facilities for both pleasure owners and commercial producers. Alternatives will be evaluated in terms of pleasure, recreation, and economic returns. Prereq: Completion of animal science sophomore and junior core courses or consent of instructor. 2 hrs and 1 lab.

4860 Lamb and Wool Production and Management (3) Integration of the principles of selection, nutrition, breeding, physiology and marketing in a complete lamb and wool production and management program. Structure of the industry, enterprise establishment, systems of management, production responses and economic returns. Prereq: Completion of animal science sophomore and junior core courses or consent of instructor. 2 hrs and 1 lab.

5000 Thesis

5091 Problems in Lieu of Thesis (1-6) May be repeated. Maximum 6 hrs.

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

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

5230 Advances in Mammalian Reproduction (3) General factors of transport, metabolism, and preservation; fertilization and embryonic mortality. Prereq: 3220 or 4230. 2 hrs and 1 lab.

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

5311 Analytical Techniques in Animal Nutrition (3) Physical and chemical analyses of feeds, ingredients, and biological fluids associated with nutrition research. 1 hr and 2 labs.

5321 Energy in Animal Nutrition (4) Energy sources in animal feeds; carbohydrate and lipid compounds; nutritional functions, metabolism, evaluation and requirements. Prereq: 3320 or consent of instructor. 3 hrs and 1 lab.

5331 Proteins in Animal Nutrition (3) Proteins in feeds, amino acids and non-protein nitrogenous compounds, nutritional functions, metabolism, evaluation and requirements. Prereq: 3320 or consent of instructor.

5410 Genetics of Animal Populations (3) The population and the individual, genes and zygotics, frequencies; forces influencing genetic changes; application to animal breeding. Prereq: Completion of animal science sophomore and junior core courses or consent of instructor. 2 hrs and 1 lab.

5710 Methods of Evaluating Experimental Data in Animal Science (3) Principles and interpretation of data from experiments in animal science based upon such statistical procedures as analysis of variance, covariance, linear regression and correlation, and multiple regression. Prereq: Statistics 2511 or equivalent. 2 hrs and 1 lab.

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

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

6000 Doctoral Research and Dissertation


6160 Topics in Dairy Microbiology (3) Microbiological problems related to various phases of the dairy industry. Prereq: Consent of instructor. 2 hrs and 1 lab.

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

6229 Environmental Physiology of Farm Animals (3) Environmental factors and their measurement; physiological mechanisms of response to environmental factors and their measurement; interrelationships of animals and environment in terms of productivity and health. Prereq: Consent of instructor. 2 hrs and 1 lab.

6320 Animal Growth and Development (3) Physiological and nutrtional aspects of growth of farm animals; effects of growth rates on performance; effects of nutrition and reproductive rate of farm animals. Prereq: 5231 and 5331 or consent of instructor.

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

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

6591 Seminar (1) Current developments and literature in animal sciences. May be repeated. Maximum 3 hrs.
Food Technology and Science

MAJOR: Food Technology and Science

Course Descriptions:

4310 Food Packaging (3) Characteristics and functions. Prereq: Food Analysis or equivalent. 2 hrs and 5710.

4811 Advanced Topics in Animal Products (1-6) Recent advances and concepts, research techniques, current problems. May be repeated. Maximum 6 hrs.

4910 Seminar (1) Seminars in animal nutrition, breeding, physiology and products. May be repeated. Maximum 6 hrs.

Food Technology and Science

MAJOR: Food Technology and Science

DEGREE: M.B.

Food Technology and Science

Professors:
J. T. Miles (Head), Ph.D. Wisconsin;
W. W. Overcast, Ph.D. Iowa State.

Associate Professors:
J. L. Collins, Ph.D. Maryland; B. J. DeMott, Ph.D. Michigan State; H. D. Illions, Ph.D. Illinois; C. C. Melton, Ph.D. Kansas State.

Assistant Professors:
S. L. Melton, Ph.D. Tennessee; M. J. Riemann, Ph.D. Kansas State.

3200 Dairy Products I (4) Procurement, processing and distribution of fluid milk. Manufacture of frozen and condensed dairy products. 3 hrs and 1 lab.

3210 Food Composition (3) Determination and study of major constituents of fresh and processed foods. Attention to changes and interactions occurring during processing and storage. Prereq: General Chemistry. 2 hrs and 1 lab.

3220 Food Preservation (4) Survey of food industry and preservation methods for prevention of deterioration of food. Prereq: General Microbiology. 3 hrs and 1 lab.

3840 Meat Science (3) Processing methods, carcass characteristics of meat animals; slaughter, cutting, selection, curing, freezing and cookery. 2 hrs and 1 lab.

4010 Food Technology and Science Seminar (1-3) Review of literature, oral and written reports. May be repeated. Maximum 3 hrs.

4030 Dairy Products II (4) Principles in the manufacture of butter, cheese and special dairy products. Prereq: 3200. 3 hrs and 1 lab.

4050 Advanced Food Composition (3) Intensive study of food constituents and changes affected by processing and storage. Prereq: 3210 and Food Analysis or equivalent. 2 hrs and 1 lab.

4110 Food Plant Sanitation (3) Environment for manufacturing and preserving foods. 2 hrs and 1 lab.

4120 Food Quality Assurance (3) Systems for quality assurance in food industries. Various methods including statistics used by food industries to assure desired quality of food products. Prereq: 3 hrs Statistics. 2 hrs and 1 lab.

4210 Food Additives (3) Substances used in food manufacturing with emphasis on properties and functions. Prereq: Food Analysis or equivalent.

4310 Food Packaging (3) Characteristics and application of materials and containers to packaging requirements of food. Prereq: 3220. 2 hrs and 1 lab.

4410 Food Crop Products (3) Food products from crops with emphasis on types, manufacturing systems, quality attributes and utility.

4810 Microbiology in Food Manufacturing (3) Relationship of growth of common food microorganisms to fermentative and enzymatic changes occurring during processing and manufacturing of foods. Prereq: General Microbiology or equivalent. 1 hr and 2 labs.

4820 Fermented Foods (3) Role of microorganisms in preparing foods with emphasis on development of certain desirable characteristics, flavor, aroma, texture, and keeping quality. Prereq: Food Microbiology. 2 hrs and 1 lab.

4840 Meat Products Manufacturing (3) Preparation of meat products with emphasis on sausage mixing and information relating to cost control, inspection and meat science. Prereq: 3840 or consent of instructor. 1 hr and 2 labs.

4920 Physical Phenomena of Foods (4) Physical states of food materials, foams, emulsions, colloidal soils, hydrates, crystals, gels. Effects of manufacturing practices on these properties. Prereq: Consent of instructor. 3 hrs and 1 lab.

5000 Thesis

5100 Seminar (1) Reports and discussions of selected topics in research literature. May be repeated. Maximum 3 hrs.

5120 Food Color (3) Chemistry of natural food pigments and their measurement, notation, and preservation in food. Prereq: Food Analysis. 2 hrs and 1 lab.

5130 Food Enzymology (3) Commercial and native enzymes in manufacturing, processing, and spoilage of food. Prereq: Physiological Chemistry.

5140 Food Flavors (3) Food flavor maintenance and improvement. Natural and synthetic compounds in the manufacture of foods with predictable consumer acceptance. Technology of flavor manufacture and formulation. Techniques for determining flavor profile. Prereq: 4210. 2 hrs and 1 lab.

5150 Fats and Oils (3) The application of technological and chemical principles associated with the processing and manufacture of fats and oils. Prereq: 3210. 2 hrs and 1 lab.

5200 Research (1-5) Research in selected areas. Consent of department head. Credits and hours to be arranged. May be repeated. Maximum 10 hrs.

5310 Food Products Development (3) Fundamentals of the art, science and technology applied to the research, development and marketing of new food products. Prereq: 4210 or 4310. 2 hrs and 1 lab.

5320 Food Thermobiology (3) Fundamentals of heat transfer as related to the rate of destruction of microorganisms and to the rate of loss of food quality through the calculation of minimum safe thermal processes for hermetically-sealed packages of foods. Prereq: 3220. 2 hrs and 1 lab.

5420 Advanced Food Quality Assurance (3) Applications of current instrumental methods used to control food manufacturing processes. Prereq: 4120. 2 hrs and 1 lab.

5510 Meat Technology (3) Physical and chemical changes that occur during the conversion of muscle to meat and the influence these changes have on quality and composition; meat packaging, preservation, and quality control. Prereq: 3840. 2 hrs and 1 lab.

5520 Microorganisms Common in Food Products (3) Identification of desirable and undesirable microorganisms in foods and their relationship to manufacturing operations. Isolation and characterization of microorganisms from food and equipment. Prereq: 4810 or Microbiology 3810. 3 labs.

5540 Microbial Cultures in Foods (3) Physical and chemical environment and metabolism of microorganisms as related to cultured food products. Prereq: 4810 and Microbiology 3810. 2 hrs and 1 lab.

Forestry

MAJORS

Forest Science


Assistant Professor: B. L. Dearden, Ph.D. Colorado State.

Forestry

3020 Forest Environments and Ecology (3) Environments and ecology of forests and associated lands; emphasis on the application of ecological principles to contemporary problems. Prereq: 8 hrs of biology, botany, or zoology.

3040 Dendrology and Silvics of Woody Angiosperms (3) Classification, nomenclature, identification, and botanical characteristics of the more common woody angiosperms native to North America; native ranges, distribution patterns, and habitat requirements; regeneration requirements and life history, place in succession; ecological significance and commercial importance. Weekly field trips during scheduled lab period plus one weekend field trip. Prereq: 8 hrs basic biology or botany. 2 hrs and 1 lab.

3050 Dendrology and Silvics of Gymnosperms (3) Classification, nomenclature, identification, and silvical characteristics of the major North American conifers. Distribution patterns, habitat, and community relationships including classification, life history, regeneration requirements, place in succession, and importance. Prereq: 8 hrs basic biology or botany. 2 hrs and 1 lab.

3110 Forest Measurements and Biometry (4) Measurements of individuals in animal and plant populations; linear regression; sampling of animal populations; growth and potential production. Prereq: Plant and Soil Science 3910 and Computer Programming, business-oriented or equivalent. 3 hrs and 1 lab.

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

3210 Forest Resource Economics (4) Allocation of forest resources via market and institutional systems. Application of economics to forest resource decision making in private and public sector. Prereq: Principles of Economics.

3220 Forest Products and Utilization (3) Harvesting, processing; marketing factors in stand conversion; intermediate and harvest cuts. Prereq: 3120.

3230 Wildlife Management (3) Important game species in the U.S.; factors influencing wildlife population dynamics. Prereq: 3220 and Forest Science 3230.
3320 Principles of Silviculture (3) Influence of site factors on reproduction, growth, development, and character of forest vegetation; classification of forest structure; silvicultural laws. Prereq: 3020 or General Ecology; 3040 or Soils.

3730 Conservation (3) Forest resources of state and nation; world; forests in soil and water conservation; wildlife and management; recreation; conservation programs.

4002 Utilization (3) Wood-using industries; processing forest products—sawnwoods, tree-log, lumber grading; pulpwood operations, flooring, plants, treating plants; plant layout, flow diagrams. Prereq: 3120.

4006 Field Methods of Timber Inventory (4) Field measurements of forest trees; timber cruising; determining appropriate sample design for specific purposes; tree and stand growth; site evaluation; field problems. Prereq: 3110.

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

4006 Silvicultural Methods (4) Methods and application of intermediate and regeneration cuttings; site preparation, planting and seedling; modifications of cutting methods to obtain desired goals and benefits. Prereq: 4002, 4003.

4220 Forest-Resource Management (4) The forest as a resource; role of forests in the hydrologic cycle; control of water quantity, quality, and regimen; watershed planning. Prereq: 4210 or consent of instructor. Two overnight field trips.

4210 Forestry Organization and Administration (3) Forestry organization; planning concepts and types of plans; administration; decision making in forest-resource management. Prereq: Junior Field Session for majors in forest resources management or senior standing for majors in the recreation option and wildlife and fisheries science.

4220 Forest-Resource Management (4) The forest as a resource; role of forests in the hydrologic cycle; control of water quantity, quality, and regimen; watershed planning. Prereq: Junior Field Session for majors in forest resources management or senior standing for majors in the recreation option and wildlife and fisheries science.

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

5240 Seminar in Forest Genetics (3) Population genetics and speculation; variation patterns and heritability in forest trees; gains with different breeding methods; planning and conducting forest genetics research. Prereq: 4420, General Genetics and consent of Instructor.

4420 Forest Tree Improvement (3) Forest tree improvement related to silviculture; nature and purposes of tree improvement and forest genetics; principles of tree cytology and population genetics; selection of seed source; variation, selection of superior phenotypes and development of seed orchards; hybridization; seed production, seed certification. Prereq: 4006. 2 hrs and 1 lab.

4430 Regional Silviculture of the United States (3) Factors that influence the silviculture management of the important tree species in North America. Importance of forests to a region; physiography, geology, soils, climate, and weather; sites and site types, ecology, problems of protection, and silvicultural characteristics of the more important species. Prereq: 4006 and 4210.

4440 Forest Recreation (3) Forest lands as a recreation resource; the interrelationships of forest recreation and other management activities; development and management of forest recreation areas; the socio-economic and political determinants of recreation development and management. Prereq: 6 credits in sociology and/or economics. 2 hrs and 1 lab.

5000 Thesis

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

5220 Seminar in Forest Tree Biology (3) Growth, reproduction, and physiology of forest trees; forest ecology; variability and taxonomy of forest trees. Prereq: 3330 or Botany 4310.

5230 Seminar in Forest Management (3) Newly developed systems in forest organization and regulation; financial and operational planning for forest management. Prereq: 4230 or equivalent.

5240 Seminar in Forest Genetics (3) Population genetics and speculation; variation patterns and heritability in forest trees; gains with different breeding methods; planning and conducting forest genetics research. Prereq: 4420, General Genetics and consent of Instructor.

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

5260 Industrial Forestry (3) Structure and analysis of forest enterprises, firms and industries. Taxation, land tenure and wood procurement alternatives. Development and application of forest products models. Prereq: 4520 or consent of instructor.

5270 Topics in Forest Industries Management (3) Current problems in industrial forestry are discussed and analyzed. Forestry executives from the public and private business sector (concerned with forest industry) are invited to conduct classes in selected topics. Prereq: 4520 or consent of instructor.

5310 Seminar (1) Current developments in forestry. May be repeated. Maximum 3 hrs. S/N/NC only.

**Wildlife and Fisheries Science**

**3230 Wildlife Management (3)** (same as Forestry 3230.)

4450 Game Mammals (4) The classification, identification, distribution, natural history, and management principles of game mammals in North America. Prereq: 3230 or 1 year of zoology. 2 hrs and 2 labs.

**Graduate credit for non-forestry and non-wildlife and fisheries science majors only.**

4460 Game Birds (4) The biology, classification, identification, distribution, and management of game birds in North America. Prereq: 3230 or 1 year of zoology. 2 hrs and 2 labs.

4510 Freshwater Fishery Biology (4) Principles and methods of fish population dynamics; sampling techniques and equipment; warm and cold-water environments as commercial and sport fisheries. Prereq: 1 yr. biology and 8 hrs. mathematics or consent of instructor. 3 hrs and 1 lab or field period.

4520 Management of Lakes and Ponds (4) Principles and methods of lake and pond management for commercial and sport fishes; design, renovation, and stocking procedures; biology and culture of managed species. Prereq: 4510 or consent of instructor. 3 hrs and 1 lab or field period.

5000 Thesis

5110 Special Problems in Wildlife and Fisheries Science (1-6) May be repeated. Maximum 9 hrs.

5210 Seminar in Wildlife Conservation (3) Current studies, problems and issues in wildlife conservation; wildlife agencies and organizations and their programs. Prereq: 3230 or consent of instructor.

5310 Seminar (1) Current developments in wildlife and fisheries science. May be repeated. Maximum 3 hrs. S/N/NC only.

4490 Advanced Topics in Wildlife Science (3) Recent advances and concepts, research techniques, and analysis of current problems. Prereq: 4450 and 4460 or consent of instructor. May be repeated. Maximum 6 hrs.

4540 Wildlife Diseases (3) Necropsy of birds and mammals. Recognition of various diseases and methods of preparing pathological materials in the field and lab. Investigative procedures concerning wildlife diseases. Prereq: 1 year zoology, 1 quarter microbiology, pathology or parasitology, 4450 or 4460, or consent of instructor. 2 hrs and 1 lab.

4602 Forest Taxation (3) The dynamics of terrestrial vertebrate predator populations in man-altered and relatively unaltered environments. Principles of predator biology and management. Prereq: 4450 and 4460 or equivalent and Zoology 4240.

5500 Advanced Topics in Fishery Science (3) Recent advances and concepts, research techniques, and analysis of current problems. Prereq: 4520 or consent of instructor. May be repeated. Maximum 6 hrs.

**Ornamental Horticulture and Landscape Design**

MAJOR

Ornamental Horticulture and Landscape Design

DEGREE

M.S.

Professor:

D. B. Williams (Head), Ph.D. Pennsylvania State.

Associate Professors:


Assistant Professors:

J. W. Day, Ph.D. Mississippi State; G. L. McDaniell, Ph.D. Iowa State.

3020 Plant Propagation (3) Physiology, methodology, and environmental requirements for propagation. Prereq: 8 hrs of biological science and labs.

3110 Greenhouse Management (3) Factors involved in management of greenhouses for pro-
duction and research. Structures, soils, pest control measures, heating, ventilating, lighting, water supply, crop succession. Prereq: Consent of instructor. 2 hrs and 1 lab.

4120 Landscape Design (4) Design and development of properties; planning, organizing, structuring, selecting, and use of plant and structural materials; methods of presentation. Prereq: Consent of instructor. 2 hrs and 2 labs.

4140 Landscape Design II (4) Advanced theory of design. Pictorial and abstract approach to landscape design. Emphasis on recreational design, analysis of contemporary trends and trends, projected needs and development of plans. Prereq: 4120 or equivalent. 2 hrs and 2 labs.

4150 Wholesale Nursery Management (3) Production, labor and sales management; location, layout, culture, equipment and facilities. Prereq: 3030 or equivalent. 2 hrs and 1 lab.

4160 Retail Nursery Management (3) Essentials of good nursery management: location, layout and operation of landscape nurseries, garden centers and chain store outlets. 2 hrs and 1 lab.

4180 Park Design (4) Design criteria for parks and outdoor recreation systems. Park site selection, analysis, planning and management as related to needs and natural and artificial resources. Evaluation of aesthetic and functional quality of parks and their impact on environmental quality of rural and suburban communities. Prereq: 4120. Recommended: 4140. 2 hrs and 2 labs.

4210 Advanced Turfgrass Management (4) Principles and scientific basis of turfgrass culture: adaptation, ecology, physiology, soil fertility and grass nutrition; climatic influences on grass culture; physiology of clipping and water management; traffic effects and compaction and the physiological influences of pest infestations and control measures. Prereq: Turfgrass Management. 3 hrs and 1 lab.

4310 Floriculture I (3) Principles and practices employed in producing cut flower crops. Application of principles of plant physiology as they control flowering, plant quality, and harvesting schedules. Prereq: Greenhouse Management, Crop Physiology, or equivalent. 2 hrs and 1 lab.

4320 Floriculture II (3) Principles and practices employed in producing horticultural crops in pots and other containers. Analysis of problems associated with growing plants in a very restricted space and controlling the controlled greenhouse conditions. Prereq: Greenhouse Management, Crop Physiology, or equivalent. 2 hrs and 1 lab.

4400 Individual Problem Study (1-5) May be repeated. Maximum 10 hrs.

5000 Thesis

5011-21 Special Problems in Landscape Design (3-5, 3-5)

5100 Special Problems in Ornamental Horticulture and Landscape Design (3) May be repeated. Maximum 9 hrs.

5210 Golf Course Design, Development, and Management (4) Principles and applications in design, development, and management of a golf course and utilization of grass varieties and other plant materials and development of specifications for their nutritional, chemical, and mechanical maintenance. Financing, equipment, and labor management; and public relations. Prereq: 4210 and consent of instructor. 2 hrs and 2 labs.


5500 Seminar (1) Discussion of current literature and developments in ornamental horticulture and landscape design. May be repeated. Maximum 3 hrs.

Plant and Soil Science

MAJOR

Plant & Soil Science M.S., Ph.D.

Professors:

L. F. Searz (Head), Ph.D. North Carolina State; F. F. Bell, Ph.D. Iowa State; H. A. Fribourg, Ph.D. Iowa State; L. M. Josephson, Ph.D. Wisconsin; W. L. Parks, Ph.D. Purdue; L. N. Skoilt, M.S. Kansas State; M. E. Springer, Ph.D. California (Berkeley); H. D. Swingle, Ph.D. Louisiana State.

Associate Professors:

D. L. Coffey, Ph.D. Purdue; B. V. Cogar, Ph.D. Washington State; L. S. Jeffery, Ph.D. North Dakota State; W. A. Krueger, Ph.D. Illinois; R. J. Ogden, Ph.D. North Carolina State; V. H. Reich, Ph.D. Iowa State; W. L. Parks, Ph.D. Wisconsin; H. C. Smith, M.S. Tennessee.

Assistant Professors:


5310 Commercial Production of Crop Season Vegetables (3) Characteristics, economic importance, adaptability, and production for fresh and processing markets; emphasis on sweet potatoes, beans, tomatoes, pepper, cucurbits, sweet corn and okra. Need not have 3510 as prereq. Prereq: 8 hrs biological science. 2 hrs and 1 lab.

5320 Commercial Production of Warm Season Vegetables (3) Characteristics, economic importance, adaptability, and production for fresh and processing markets; emphasis on sweet potatoes, beans, tomatoes, pepper, cucurbits, sweet corn and okra. Need not have 3510 as prereq. Prereq: 8 hrs biological science. 2 hrs and 1 lab.


5370 Principles of Weed Science (4) Basic principles of weed science; history, ecology, economic losses, means of control, types of herbicides, and specific recommendations for various crop and non-crop uses. Prereq: 8 hrs biological sciences. 3 hrs and 1 lab.

5410 Soil Chemistry (4) Colloidal systems; properties and behavior of colloidal soil materials; relations of chemical properties to plant nutrient availability. Prereq: Soils and Introductory Physics. 3 hrs and 1 lab.

5420 Principles of Crop Breeding (4) Genetic principles and techniques. Prereq: 8 hrs biological science or permission of instructor. 3 hrs and 1 lab.

5430 Soil Analysis (3) Analytical techniques used in soil chemistry and soil fertility studies. Prereq: 4110 or concurrent. 2-3 hrs.

5450 Agricultural Chemicals and the Environment (4) Characteristics, use, mode of action, degradation and environmental impact of chemicals used in agriculture, forestry and related areas with emphasis on agricultural pesticides; environmental standards imposed by federal and state regulations on chemical development and use. Prereq: 1 year biological sciences and 1 year chemistry. 3 hrs and 1 lab.

5470 Soil Formation, Morphology, and Classification (4) Soil formation; properties, distribution, and classification of soils; interpretation of morphology; use of soil surveys. Prereq: Soils. 3 hrs and 1 lab.

5490 Problems in Plant and Soil Science (1-6) May be repeated. Maximum 9 hrs.

5500 Thesis

5511-21 Special Problems in Lieu of Thesis (3, 3)

5610 Special Problems in Ornamental Horticulture and Landscape Design (3) May be repeated. Maximum 9 hrs.

5710 Golf Course Design, Development, and Management (4) Principles and applications in design, development, and management of a golf course and utilization of grass varieties and other plant materials and development of specifications for their nutritional, chemical, and mechanical maintenance. Financing, equipment, and labor management; and public relations. Prereq: 4210 and consent of instructor. 2 hrs and 2 labs.

5710 Special Problems in Golf Course Design, Development, and Management (4) Special problems in golf course design, development, and management. Prereq: 5210. 2 hrs and 1 lab.

5910 Special Problems in Golf Course Design, Development, and Management (4) Special problems in golf course design, development, and management. Prereq: 5210. 2 hrs and 1 lab.

1 Clyde B. Austin Distinguished Professor.
5200 Pedology (4) Factors and processes of formation as related to the physical, chemical, and mineralogical properties of soils; soil in an ecosystem; classification of soils. Prereq: 4320 or consent of instructor. 3 hrs and 1 lab.

5310 Design and Interpretation of Experiments (3) Experimental design and procedures; effect of different variables on precision of experiments; problems dealing with the analysis of data. Prereq: 3610 or equivalent.

5340 Soil Physics (3) Chemical and physical relationships among the solid, liquid, and gaseous phases of the soil mass; their relation to plant growth and soil management. Prereq: 4110. 2 hrs and 1 lab.

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

5720 Quantitative Genetics (3) The genetic constitution of population and changes in gene frequency; recognition and measurement of continuous variation; estimation of variable components and genetic advance under different breeding procedures. Prereq: Basic Genetics or consent of instructor.

5730 Soil Physical Chemistry (3) Structural properties of soil minerals determining their physiochemical reactions, ion exchange, Donnan equilibrium, double layer theory. Prereq: 4110; Chemistry 4110 or concurrent registration.

5700 Seminar (1) May be repeated. Maximum 3 hrs.

5710 Advanced Plant Genetics (3) Importance of polyploidy in plants; detailed study of genome relationships, genetic recombination, mutation, heterosis, quantitative inheritance, heritability selection, and self-incompatibility systems in relation to genetic principles. Prereq: Basic Genetics or consent of instructor.

5750 Advanced Plant Breeding (4) Historical development of plant breeding concepts and methods, effects of heterosis, inbreeding, hybridization and selection. Improvement of self and cross pollinated crops. Prereq: 5710. 3 hrs and 1 lab.

5600 Seminar (1) May be repeated. Maximum 3 hrs.

5810 Crop Climatology (4) Meteorological factors affecting crop plants; crop distribution and centers of origin; general and specific climatic, weather, and vegetative systems; microclimatic influences on plant growth. Prereq: 3020, 3040; or Botany 3210, 4310 or consent of instructor. 3 hrs and 1 lab.

5850 Mechanisms of Herbicide Action (3) Principles of the uptake, translocation, mode of action and basis of selectivity of herbicides. The effects of herbicides on plant morphology, metabolic systems and enzymatic activities will be discussed. Prereq: Botany 3210 and Biochemistry 4110 or consent of instructor.

6410 Experimental Designs (3) Principles of experimental designs used in agricultural research. Completely randomized, randomized complete block and Latin square designs; the factorial experiment and confounding; lattice designs; and covariance. Prereq: 5310.

6510 Growth Control with Chemicals (3) Character, theories of action and use of auxins, gibberellins, cytokinins and inhibitors. Range of effects on growth. Prereq: Botany 3210 or equivalent. 2 hrs and 1 lab.

6600 Seminar (1) May be repeated. Maximum 3 hrs.
School of Architecture

Donald D. Hanson, Dean
William J. Lauer, Assistant Dean

Professors:

Instructor:
J. C. Chen, M.S. Tennessee.

4025 Accelerated Historical Studies I (4) Relationship of historical and cultural development of the man-made environment. Concepts of ethics, aesthetics and criticism along with methods of historical research and analysis are introduced as a means of studying the classical tradition of architecture. In addition to the regular lecture series of the first course in Historical Studies, students are required to independently research aspects of study area for presentation to the accelerated seminar supplement.

4026 Accelerated Historical Studies II (4) Concentrated examination of development of twentieth-century design and architectural theory and products as derivative or counter point to examples of historical development. Events occurring in specific time frames of pre-industrial and industrial periods are contextualized to demonstrate potential developments in the emerging post-industrial era. In addition to the regular lecture series of 2005, students are required to independently research aspects of study area for presentation to the accelerated seminar supplement.

4170 Introduction to Preservation and Restoration (4) History and theory of restoration and preservation.

4311 Historic Preservation Laboratory (8) Directed studies for buildings of historical significance. Techniques of preservation, research of historic methods of construction, and studies of viable uses. Rehabilitation, restoration, preservation and adaptive uses.


4850 Elementary Structural Matrix Methods (4) Introduction to the generalized matrix method of analysis of structure. Review of matrix algebra and vectors; development of member stiffness and flexibility matrices; assembly of structure stiffness and flexibility matrices. Prereq: Consent of instructor. (Same as CE 4850 and Engr. Sci. 4850.)

4900 Aspects of Urban Environment (4) Interdisciplinary course in urban problems. Prereq: Consent of instructor. (Same as Political Science 4900, Psychology 4900, Real Estate 4900.) S/NC only.

4910 Architectural Photography (4) Use of photography as a design, research, and presentation medium. Emphasis on architectural photography using black and white media.

4920 Advanced Architectural Photography (4) Application of special photographic techniques with emphasis on color printing and processing. Prereq: Consent of instructor.
Graduate programs of the College of Business Administration are designed to prepare men and women to assume executive, managerial and professional positions in the increasingly complex world of domestic and international business and industry, teaching and research, government, and institutional management.

Viewing the business firm as operating in a dynamic social, political and economic environment which demands leaders capable of dealing with innovation and rapid change, the College places central importance on development of students’ thought processes rather than on specialized subject matter and courses descriptive of past practices. Emphasis is focused on flexibility of mind, receptivity to new ideas, capacity to adapt one’s reasoning powers and judgment to rapid changes, vigor and imagination in using the mind, ability to reason analytically and logically and, above all else, inculcation of an irrepressible desire to continue to learn and grow in knowledge throughout the student’s life.

**Graduate Programs**

The College of Business Administration offers programs leading to six advanced degrees: the Doctor of Business Administration, the Doctor of Philosophy in Economics and in Management Science, the Master of Arts and the Master of Science in College Teaching with a major in Economics, the Master of Science with majors in Economics, Management Science and Statistics, and the Master of Business Administration. Also, the Department of Industrial and Personnel Management participates with the Department of Psychology in the College of Liberal Arts in offering an inter-collegiate program in Industrial and Organizational Psychology leading to the Master of Science and Doctor of Philosophy degrees. (See page 100.)

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.

**The MBA Program**

The College-wide curriculum of the Master of Business Administration program is designed to prepare students for successful careers in business and institutional management and for imaginative and responsible citizenship and leadership roles in business and society. The program is designed to encompass the major functional areas of business and economics in order to provide the perspective necessary for those who aspire to positions of executive and professional leadership.

The curriculum reflects the application of evolving knowledge in economics and the behavioral and quantitative sciences. This program is accredited by the American Assembly of Collegiate Schools of Business.

Completion of the MBA program requires from four to six quarters (51 to 78 quarter hours of course work) for a full-time student, depending upon the individual’s undergraduate preparation in business and economics. The four-quarter sequence is designed for those who have completed a baccalaureate program in business administration. Those with undergraduate degrees in the humanities, engineering, social sciences or natural sciences will require up to six quarters, depending upon the extent of their preparation in business and economics.

There is no thesis requirement although ample opportunity is provided for research and writing in course work. Students may begin the program in any of the four quarters of the academic year; however, sequencing of courses is such that entry in the summer or fall terms may be advantageous.

The MBA student may select an area of concentration from the following fields:

- Accounting
- Economics
- Finance
- Forest Industries
- Management
- Governmental
- Financial
- Administration
- Industrial
- Management
- Real Estate
- Development
- Statistics
- Transportation and Logistics
- Marketing
- Management Science

All entering students must have completed college-level mathematics through at least one quarter (or semester) of calculus or remove the deficiency by taking appropriate courses in mathematics. Specific requirements of the M.B.A. program are shown below. To qualify for the degree, a student must complete a minimum of 51 quarter hours of graduate course work in Groups B, C, and D, at least 42 hours of which must be at or above the 5000 level. Further, at least half of the credit hours taken in Group C (concentration area) must be at or above the 5000 level.
Group A—Foundation Courses. Required for students who lack adequate preparation in the areas listed. Any or all of these courses may be waived if the student has completed undergraduate course equivalents. Additional prerequisite courses may be required for certain concentration areas. These courses are available only to satisfy Group A requirements and as stated on page 69.

<table>
<thead>
<tr>
<th>Course</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acctg. 5050-60 Financial Accounting</td>
<td>6</td>
</tr>
<tr>
<td>Bus. Law 5050 Legal Environment of Management Science</td>
<td>3</td>
</tr>
<tr>
<td>Econ. 5050-60 Economic Analysis, Problems and Policies</td>
<td>6</td>
</tr>
<tr>
<td>Fin. 5050 Survey of Finance</td>
<td>3</td>
</tr>
<tr>
<td>Ind. Mgt. 5050 Production Management</td>
<td>3</td>
</tr>
<tr>
<td>Mktg. 5050 Survey of Marketing</td>
<td>3</td>
</tr>
<tr>
<td>Off. Admin. 5050 Data Processing in Business</td>
<td>3</td>
</tr>
</tbody>
</table>

Group B—Core for all Candidates. Includes Management Science 5310.

<table>
<thead>
<tr>
<th>Course</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ. 5110, Accounting for Control</td>
<td>3</td>
</tr>
<tr>
<td>Fin. 5110 Theory of Financial Management</td>
<td>3</td>
</tr>
<tr>
<td>Ind. Mgt. 5320, Human Problems in Administration</td>
<td>3</td>
</tr>
<tr>
<td>Mktg. 5200, Marketing Management</td>
<td>3</td>
</tr>
<tr>
<td>Stat. 5311, Probability Theory</td>
<td>3</td>
</tr>
<tr>
<td>Quantitative Option (select one): Mgt. Sci. 5100, Introduction to Management Science</td>
<td>3</td>
</tr>
<tr>
<td>Stat. 5312, Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>Bus. Adm. 5310, Business Policy</td>
<td>3</td>
</tr>
<tr>
<td>Total, Group B</td>
<td>27</td>
</tr>
</tbody>
</table>

Group C—Concentration. At least 12 but not in excess of 18 quarter hours of graduate level courses are required in one area of concentration. At least half of the credits used to satisfy this requirement must be earned in courses at or above the 5000 level. Any exception must be approved by the student’s faculty committee. To the extent that the concentration area is decreased below 18 hours, Group D—Electives is increased. A student may elect two areas of concentration of 12 quarter hours each, in which case no courses are required in Group D—Electives. (All double concentration programs should be coordinated through the Graduate Programs Office of the College of Business Administration.)

| MBA CONCENTRATIONS: Typical course groupings are listed below. Area prerequisites may be taken in one's undergraduate program or included in the MBA curriculum prior to undertaking courses in the concentration area. Accounting. Graduates are eligible for the CPA examination in Tennessee. Area prereq.: Introductory Financial Accounting (6); Introductory Cost Accounting (6); Intermediate Theory (9); and Federal Income Tax (3).
<table>
<thead>
<tr>
<th>Area</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Management</td>
<td>5120, 5130, 5140, 5520, 5580, 5990</td>
</tr>
<tr>
<td>Investments</td>
<td>5420, 5430, 5810</td>
</tr>
<tr>
<td>Monetary and Fiscal Policy</td>
<td>5210, 5220, 5320, 5510, 5510, 5580</td>
</tr>
<tr>
<td>Forest Industries Management</td>
<td>5260</td>
</tr>
<tr>
<td>Governmental Financial Administration</td>
<td>none, 5210, 5220, 5320, 5320</td>
</tr>
<tr>
<td>Political Science</td>
<td>5740</td>
</tr>
<tr>
<td>Industrial Management</td>
<td>5050 or equivalent (for 5410 only).</td>
</tr>
<tr>
<td>Management of Industrial Research</td>
<td>5110, 5120, 5130</td>
</tr>
<tr>
<td>Personnel Management</td>
<td>5210, 5220, 5230 (core course), 5240</td>
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<tr>
<td>Production Management</td>
<td>5410, 5420, 5430</td>
</tr>
<tr>
<td>Management of Industrial Research</td>
<td>5320</td>
</tr>
<tr>
<td>Management of Foreign Operations</td>
<td>5710</td>
</tr>
<tr>
<td>Statistics</td>
<td>5110</td>
</tr>
<tr>
<td>Management Science</td>
<td>5310, 5320, 5340</td>
</tr>
</tbody>
</table>

One or two additional courses selected from computer science, management science, management science, statistics, or mathematics as approved by the faculty advisor. Marketing. Area prereq.: Marketing 5050 or equivalent and 5200 (core course). Any combination of 12-18 quarter hours of marketing courses listed in this catalog as approved by the faculty advisor. Real Estate and Urban Development. Area prereq.: none. Total, Group D | 6-12 |

Total Program (except Group A) | 51

Other Requirements. The application for Admission to candidacy (see p. 18) must be approved by two faculty members in the student’s area(s) of concentration and the Assistant Dean for Graduate Programs of the College of Business Administration before submission to the Vice Chancellor for Graduate Studies and Research.

To qualify for the degree, the student must achieve a B average (3.0) or above in courses taken in the concentration area(s) as well as in the overall program and pass a written comprehensive examination during the final quarter of the program. If the results of the written examination are not clearly passing or failing, a supplementary written or oral examination may be given in the same quarter. The complete examination process may be repeated one time, but it may not be taken until the quarter following the first attempt.

Joint J.D.-M.B.A. Program

The College of Business Administration and the College of Law offer a coordinated joint program leading to the conferment of
both Doctor of Jurisprudence and the Master of Business Administration degrees. A student pursuing the joint program may save up to two academic quarters (24 hours) of course work which would be required if the two degrees were to be earned separately.

Admissions. Applicants for the J.D.-M.B.A. program must make separate application to, and be competitively and independently accepted by, the College of Law for the J.D. degree and the Graduate School and College of Business Administration for the M.B.A. degree, and by the Joint Degree Committee. Application may be made at any time prior to, or after, matriculation in either college, but prior to completion of the second year of law school (84 quarter hours), and prior to entry into the last 24 quarter hours of the M.B.A. program.

Curriculum. A joint program candidate must satisfy the graduation requirements of each college. Students withdrawing from the joint program before completion of both degrees will not receive credit toward graduation from either college for courses in the other college, except as such courses qualify for credit without regard to the joint program.

The College of Law will award credit toward the J.D. degree for acceptable performance in a maximum of 12 quarter hours of approved graduate level courses offered by the College of Business Administration. The equivalent of the 12 quarter hours must be earned in Accounting 5810 or a more advanced accounting course. If College of Law credit is given for such an accounting course, the joint program student may not receive College of Law credit for Legal Accounting (Law College Course 6590).

The College of Business Administration will award credit toward the M.B.A. degree for acceptable performance in a maximum of 12 quarter hours of approved courses offered by the College of Law.

Except while completing the first year courses in the College of Law, students are encouraged to maximize the integrative facets of the joint program by taking courses in both colleges each quarter.

Awarding of Grades. For grade recording purposes in the College of Law for graduate business courses and in the College of Business Administration for law school courses, grades awarded will be converted to either Satisfactory or No Credit and will not be included in the computation of the student’s grade average or class standing in the college where such grades are so converted. The College of Law will award a grade of Satisfactory for a graduate business course in which the student has earned a B grade or higher and a No Credit for any lower grade. The College of Business Administration will award a grade of Satisfactory for a 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 graded basis for any appropriate purpose in the college offering the course. The student must pass a final written comprehensive examination to receive the M.B.A. degree.

The DBA Program
The basic objective of the Doctor of Business Administration program is to provide the student an opportunity to attain the intellectual competence necessary to meet the highest standards for advancement to a professional position in an academic institution, business and industry, or government. The student will develop a sound foundation for expanding knowledge in the student’s chosen area of concentration and will contribute through research to advancement of the state of knowledge in this area. Moreover, the student’s educational experience should develop perspective toward education for business in a manner that will enable the student to spearhead innovation and change in response to needs.

The DBA program is structured around four major features. First, it recognizes the interdisciplinary thrust of graduate education and provides the student with a sound foundation for expanding the body of knowledge related to business systems and their interactions with other socio-economic systems and environmental forces. Second, the student’s program is flexible enough to respond to individual needs and interests yet formulated within a sound framework so as to achieve overall objectives. Third, emphasis is placed upon conceptual foundations and analysis of decision-making processes rather than the descriptive aspects of business administration. Fourth, the student does work in advanced economic theory and in both the behavioral and quantitative sciences coupled with an in-depth assessment of one of the three areas.

Program Framework. Program prerequisites include at least one year of college mathematics to include college algebra, matrix algebra, calculus of a single variable and partial differentiation; knowledge of computer programming (FORTRAN); Intermediate economic theory; and introductory courses in financial accounting, financial management, marketing management, operations (production) management and the legal environment of business. Entering students deficient in any of these prerequisite areas may enroll in courses especially designed to meet these requirements. Previously completed graduate courses will be evaluated against DBA program requirements and where equivalence is found, credit will be allowed. Each student’s program consists of three major segments:

I. Course Work
A. CORE FOR ALL STUDENTS. The courses listed below provide a graduate level foundation in the key decision-making, or functional, areas of business coupled with a study of economic theory, behavioral science and quantitative analysis.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acct. 5810</td>
<td>Accounting for Control</td>
<td>3</td>
</tr>
<tr>
<td>Acct. 5820</td>
<td>Corp. Reporting Prob.</td>
<td>3</td>
</tr>
<tr>
<td>Econ. 5111-12</td>
<td>Microecon. Theory (3,3)</td>
<td>9</td>
</tr>
<tr>
<td>Econ. 5121</td>
<td>Macroecon. Theory (3)</td>
<td>3</td>
</tr>
<tr>
<td>Econ. 5111</td>
<td>Microecon. Theory (3)</td>
<td>3</td>
</tr>
<tr>
<td>Econ. 5121-22</td>
<td>Macroecon. Theory (3,3)</td>
<td>3</td>
</tr>
<tr>
<td>Fin. 5110</td>
<td>Theory of Financial Mgt.</td>
<td>3</td>
</tr>
<tr>
<td>Ind. Mgt. 5110</td>
<td>Organizational Theory</td>
<td>3</td>
</tr>
<tr>
<td>Ind. Mgt. 5610-20</td>
<td>Organizational Behavior</td>
<td>6</td>
</tr>
<tr>
<td>Mkgt. 5200</td>
<td>Marketing Management</td>
<td>3</td>
</tr>
<tr>
<td>Mgt. Sc. 5100</td>
<td>Mgt. Science Techniques</td>
<td>3</td>
</tr>
<tr>
<td>Stat. 5311</td>
<td>Probability Theory</td>
<td>3</td>
</tr>
<tr>
<td>Stat. 5312</td>
<td>Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>Trans. 5210</td>
<td>Business Logistics</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Core</strong></td>
<td></td>
<td><strong>42</strong></td>
</tr>
</tbody>
</table>

The above requirements may be satisfied by completing course work at this or another accredited institution or by passing proficiency examinations in certain of the areas. These courses may be taken concurrently with courses required under B, C, D, and E below.

B. CONCENTRATION AREA. This is the focal point of the program and the area in which the student expects to do his/her research and dissertation. A minimum of 18 quarter hours (including at least 9 quarter hours of doctoral-level work taken at The University of Tennessee, Knoxville) is taken in one of the following areas: Accounting, Finance, Management, Marketing, Transportation and Logistics.

C. SUPPORTING AREA (minimum of 12 quarter hours). The purpose of this work is to expand the student’s understanding of business beyond the area of concentration and to complement the dissertation research effort. The chosen area should have a clear relationship to the concentration and serve to strengthen the student’s overall capacity to do scholarly work in specific areas of research interest within his/her concentration. The area may be selected from those offered within the College of Business Administration or in other fields within the University, including but not limited to mathematics, engineering, communications, public administration and political science, history, philosophy, psychology, sociology, law, and other relevant areas.
D. OPTIONAL AREA (Minimum of 12 quarter hours). The student has the option of choosing either behavioral science, economics, or quantitative methods as an area in which to gain proficiency beyond work completed in the core. Requirements for this area are as follows:

<table>
<thead>
<tr>
<th>Behavioral Science</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ind. Mgt. 6250-60-70 Seminar in Ind. and Org. Psy. (select two courses)</td>
<td>6</td>
</tr>
<tr>
<td>Electives in Behavioral Science (6000 level)</td>
<td>6</td>
</tr>
</tbody>
</table>

Economics: A field in economics to be chosen from advanced economic theory, econometrics, or monetary economics to be approved by the student's academic committee.

Quantitative Methods. Select one of the following two options with substitution of core quantitative courses as indicated:

<table>
<thead>
<tr>
<th>Quantitative Methods</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. (Core: Stat. 5050, 5060; Mgt. Sci. 5100) Statistics 5070, 6060, 6070</td>
<td>9</td>
</tr>
<tr>
<td>Elective in statistics, mathematics, management science or computer science</td>
<td>3</td>
</tr>
<tr>
<td>2. (Core: Stat. 5311 or 5110, 5312) Management Science 5310, 5330, 5340</td>
<td>9</td>
</tr>
<tr>
<td>Elective in statistics, mathematics, management science or computer science</td>
<td>3</td>
</tr>
</tbody>
</table>

E. RESEARCH METHODS AND ACADEMIC PRACTICUM (minimum of six quarter hours). The objective of work in this area is to develop the student's capabilities in research and university level teaching methods and techniques.

<table>
<thead>
<tr>
<th>Research Methods and Academic Practicum</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Adm. 6900 Res. Meth. in Business</td>
<td>3</td>
</tr>
<tr>
<td>Business Adm. 5900 Academic Practicum</td>
<td>3</td>
</tr>
</tbody>
</table>

II. Admission to Candidacy. A student may apply for Admission to Candidacy for the DBA degree after maintenance of at least a B average in course work, successful completion of preliminary examinations in the concentration area, supporting area and option area, and acceptance of his/her research proposal for the dissertation.

III. Research and Dissertation (minimum of 36 quarter hours). The purpose of this segment is to provide the candidate with a research experience that meets the general standards of the profession. The dissertation is supervised by the candidate's faculty committee, who must certify its completion and acceptability after the candidate's oral defense of his/her research effort.

Minimum Academic Performance Standards

A graduate student in the College of Business Administration must have a grade point average at any point after 12 hours is below 3.0 shall be placed on probation. A student on probation shall 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 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 Programs of The College of Business Administration upon recommendation of the student's faculty committee.

Admission Requirements

General admission requirements for the Graduate School are stated on pages 11-12. MBA and DBA applicants are required to take the Graduate Management Admission Test (GMAT) which is regarded as a placement test for programs in economics, management science, and statistics. Applicants for economics who submit GRE aptitude scores must also submit the GRE aptitude portion. Applicants for economics, management science, and statistics who will be accepted must have a cumulative grade point average of 3.0 or higher at the end of the probationary period. The probationary period is defined as the next 12 quarter hours of course work attempted which is specified in the student's degree program. Exceptions to this policy may be made only with the approval of the Assistant Dean for Graduate Programs of The College of Business Administration upon recommendation of the student's faculty committee.

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</tr>
</thead>
<tbody>
<tr>
<td>1. (Core: Stat. 5050, 5060; Mgt. Sci. 5100) Statistics 5070, 6060, 6070</td>
<td>9</td>
</tr>
<tr>
<td>Elective in statistics, mathematics, management science or computer science</td>
<td>3</td>
</tr>
<tr>
<td>2. (Core: Stat. 5311 or 5110, 5312) Management Science 5310, 5330, 5340</td>
<td>9</td>
</tr>
<tr>
<td>Elective in statistics, mathematics, management science or computer science</td>
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</tr>
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<td>9</td>
</tr>
<tr>
<td>Elective in statistics, mathematics, management science or computer science</td>
<td>3</td>
</tr>
</tbody>
</table>

Fellowships and Assistantships

Fellowships. Information concerning non-service fellowships administered by the Graduate School as well as application blanks, may be obtained from the office of the Vice Chancellor for Graduate Studies and Research.

Assistantships. A limited number of graduate assistantships are available in each of the academic departments and in the Center for Business and Economic Research. Assistantships which carry remission of tuition and/or fees range up to $4500 per year, while others funded through various sources of the University range up to $5500 per year for half-time service. 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 Assistant Dean for Graduate Programs. Applications must be received by March 15 for consideration of assistantships to be awarded for the following fall term.

Center for Business and Economic Research

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

Tennessee Executive Development Program

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

The TEDP limits enrollment to 32 participants who 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.
38 College of Business Administration

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 deep experience in either consultation or actual operations in business and industry. The TEDP faculty is augmented by outstanding practitioners in their fields of business and industry.

Departments of Instruction

Numbers in parentheses following the course titles indicate quarter hours credit offered.

Accounting and Business Law

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

ACCOUNTING

Professors:
N. E. Ditterich, Ph.D. Ohio State, C.P.A.;
R. W. Metcalf (visiting), D.B.A. Indiana, C.P.A.

Associate Professors:
I. A. Posey, M.S. Tennessee, C.P.A.;
N. E. Shurtz, J.D. Ohio State.

Assistant Professors:
H. C. Hering, III, Ph.D. Alabama, C.P.A.;

I. A. Posey, M.S. Tennessee, C.P.A.;
W. L. Single, M.S. Tennessee, C.P.A.;
R. T. Townsley, Ph.D. Texas, C.P.A.;
F. W. Watkinson, Ph.D. Louisiana State, C.P.A.

4120 Advanced Auditing (3) Legal and professional responsibilities of the auditor, evaluation of internal control, utilization of ED and statistical techniques in auditing, and auditing reports. Prereq: 4110 with C or better.


4960 Individual Research in Accounting (3) Special projects undertaken by majors in accounting under the direction of faculty members of professional rank. Prereq: Intermediate Accounting with C or better.

4990 Senior Seminar (3) Advanced problems in the financial accounting area are analyzed and discussed by students. Prereq: Intermediate Accounting with C or better.

5000 Thesis

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

5050-60 Introduction to Financial Accounting (3, 3) Classification and presentation of financial data, basic accounting concepts underlying asset valuation and income measurement, interpretation of financial statements. (Available only as stated on page 35.)

5110 Seminar in Accounting Theory (3) Accounting postulates, principles, and procedures. Concepts of value as they relate to the measurement of performance and position. Prereq: Three quarters or two semesters of Intermediate Accounting.

5120 Seminar in Advanced Auditing (3) Standards and procedures of special investigations; audit reports and reports filed with the S.E.C. Auditing EDP systems and use of statistical sampling are emphasized. Prereq: A course in auditing concepts or equivalent.

5130 Seminar in Current Accounting Topics (3) Current controversial issues in financial accounting. Prereq: three quarters or two semesters of Intermediate Accounting.

5210 Seminar in Advanced Cost Accounting (3) Cost allocation, method of pricing, work in process, accounting for non tangible assets, income tax burden, taxes on planning and quantitative techniques in management accounting. May not be taken for credit by students whose undergraduate major was accounting, or whose graduate concentration is accounting. Prereq: 5810 or consent of instructor.

5310 Auditing Concepts (3) Concepts and theory of auditing, the environment of internal and external auditing, nature of evidence, internal control evaluation, and reporting. Not intended for persons who have credit for an auditing course. Prereq: Intermediate Accounting, and 5340 or equivalent.


5420 Seminar in Advanced Taxation (3) Income determination, tax planning organization of the Internal Revenue Service, administrative settlements in tax disputes. Prereq: A course in advanced income tax.

5510 Governmental Accounting (3) Theory and practice of budgetary and fund accounting, financial reporting, measures of output and accomplishment, and financial and performance auditing for governmental and nonprofit organizations. Prereq: 9 hrs of accounting and consent of instructor.

5520 Accounting Systems and EDP Concepts and Control (3) Elements and operation of a computer in a business environment. The analysis, design, implementation, documentation, and control of accounting systems. Prereq: Introductory Cost Accounting and knowledge of a computer programming language.

5640 Seminar in Management Information Systems (3) Survey of the literature on business information systems and advanced systems analyses and design concepts. The information needs of all functional areas and the interfacing of these areas will be considered. Prereq: 5630 and consent of instructor.

5610 Accounting for Control (3) Funds statements, analysis of financial statements, budgets, responsibility accounting, impact of income taxes on costs, and other techniques in management accounting. May not be taken for credit by students whose undergraduate major was accounting, or whose graduate concentration is accounting. Prereq: 5050-60 or equivalent.

5820 Corporate Reporting Problems (3) A user's analysis of current corporate financial reporting problems and issues. May not be taken for credit by students whose undergraduate major was accounting, or whose graduate concentration is accounting. Prereq: 5810 or consent of instructor.

6000 Doctoral Research and Dissertation

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

Business Law

Professor: M. L. Townsend, J. D. Tennessee.

Associate Professor: B. D. Fisher, L.L.M. George Washington.

Assistant Professor: N. E. Shurtz, J.D. Ohio State.

5050 Legal Environment of Business (3) Surveys legal and quasi-legal institutions with emphasis on the administrative agencies which have particular significance to the businessman; examines government regulation of business; explains basic legal notions and principles that pertain to businessmen. (Available only as stated on page 35.)

Business Administration

MAJOR DEGREES

Business Administration M.B.A., D.B.A.

5310 Business Policy (3) Case studies covering policy formulation and administration; point of departure—top and middle management, where company-wide objectives are set and departmental policies and activities coordinated; emphasizes sizings up company's situation, determining objectives, developing sound policies, organizing and administering personnel to arrive company objectives, continuous administrative reappraisals. Enrollment priority given M.B.A. students in last quarter of their program. Prereq: All other Group B (core) courses of M.B.A. program.

5410 Business and its Societal Environment (3) An analysis of current forces and changes in society and the interrelationship of plans and actions in business firms with environmental factors. Prereq: Consent of instructor.

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

5900 Academic Practicum (3) Concepts, methods, and materials in the instruction of Business Administration subjects at the college level.

6900 Research Methodology (3) Philosophy and design of research in Business Administration.

Business Education

See College of Education

Economics

MAJOR DEGREES

Economics M.A., M.A.C.T., M.S., Ph.D.

two of which must be selected from the following list and only one of which may be from the first three fields listed:

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

- **4000 Special Topics** (3) Student-generated course offered at convenience of department, upon student initiative. Subject matter and contents determined by students and instructor with approval of the department.
- **5000 Thesis**
- **5002 Non-Thesis Graduation Completion** (3) Required for the non-thesis student not otherwise registered during any quarter when such a student uses department facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only.
- **5011-12 Problems in Lieu of Thesis** (3, 3)

**ECONOMICS**

- **5100 Introduction to Economic Problems and Policy** (3) Economic system; subjects discussed are the economic fundamentals of production and distribution. Prereq: 4170 or equivalent.
- **5121-22 Macroeconomic Theory** (3, 3) Determination of the levels of employment and prices for the economy as a whole, focusing on the relationships between interest rates, price expectations, productivity, and the quantity of money, on the one hand, and aggregate saving, investment, and liquidity preference on the other. Prereq: Intermediate economic theory or equivalent.
- **5160 History of Economic Thought** (3) Development of economic ideas from the mercantilists through Alfred Marshall; emphasis given to the classical and neo-classical tradition.
- **5180-90 Mathematical Methods in Economics** (3, 3) Applications of basic concepts in the differential and integral calculus, difference and differential equations, linear algebra and stochastic processes to modern economic theory. Prereq: the firm, growth models. Must be taken in sequence. Prereq: 5050-60.
- **5111-12 Microeconomic Theory** (3, 3) Fundamental theory of price determination in partial and general equilibrium settings, including theories of preferences and consumer behavior, production, short and long-run profit maximization under conditions of perfect and imperfect competition, and demand for factors of production and distribution. Prereq: 4170 and intermediate economic theory or equivalent.
- **5211-22 Macroeconomic Theory** (3, 3) Determination of the levels of employment and prices for the economy as a whole, focusing on the relationships between interest rates, price expectations, productivity, and the quantity of money, on the one hand, and aggregate saving, investment, and liquidity preference on the other. Prereq: Intermediate economic theory or equivalent.
- **5400 Advanced Microeconomic Theory** (3) Topics in microeconomic theory. Prereq: Introductory statistics or Statistics 5211 or equivalent.
- **5500 Introduction to Economic Analysis** (3) Advanced economic theory and modeling. Designed for beginning graduate students who have limited training in analytic and microeconomic theory. Must be taken in sequence. Prereq: Intermediate Micro Theory and college algebra, calculus, and analytic geometry or the equivalent.

**DOCTORAL PROGRAM**

**Subject Area Requirements.**

1. Students will be required to demonstrate their competence in the core subject fields as indicated:
   a. Economic theory, by a preliminary examination.
   b. Economic history, by completing six hours in economic history at the 5000 level or above with an average grade of B or better or by satisfying an examining committee.
   c. History of economic thought, by completing Economics 5150 and three additional hours in this area at the 6000 level with an average grade of B or better or by satisfying an examining committee.
   d. Mathematical and quantitative methods in economics, by completing Economics 5180, 5190, and 5510 with the average grade of B or better or by satisfying an examining committee. Note: The Economics 5510 requirement may be waived for those students completing Economics 6170, 6180, and 6190.
2. Students will be required to demonstrate their competence by preliminary examination in three fields with the approval of the department, at least
development of international economics and economic development. In areas of current importance in the fields both of international economics and economic development.

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

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

6270 Seminar in the Economic History of the Third World (3) Selected topics in the economic history of societies other than those of Western Europe and English-speaking North America. May be repeated for credit with permission of the department. Prereq: Consent of instructor.

6610 Seminar in Regional Analysis (3) Selected topics in regional economic theory and analysis. May be repeated. Maximum 6 hrs.

6520 Regional Economics Workshop (3) Selected topics in applied regional research. Emphasis on student participation in model design and estimation, forecasting, simulation and mathematical and computer programming. May be repeated. Maximum 6 hrs.

INDUSTRIAL ORGANIZATION

4350 Industrial Organization Analysis (3) Monopoly and competition in the United States economy; market structure, business behavior, and economic performance and their interrelationships. Prereq: 9 hrs of introductory economics.

5240 Seminar in Private Enterprise and Public Policy (3) The structure of contemporary industry, factors in its development, and consequences for business conduct and performance; social control of business through antitrust and other government regulation.

6351-52, 6361-62 Seminar in Industrial Organization (3, 3) 6351-52-Survey of the organization of industry in the American economy, with emphasis on the empirical and analytical techniques used in investigating structure, conduct and performance. 6351-52-Public Policy in the United States with respect to industrial structure and business conduct; examination, appraisal and proposals for change.

ECONOMICS OF CENTRALLY PLANNED ECONOMIES

5310 Economic Systems (3) Study and appraisal of underlying theories and operation of capitalism, socialism, communism, and other economic systems.

5331 Theory and Practice of Economic Planning (3) Leading issues in imperative and indicative planning. Prereq: Consent of instructor. May be repeated with consent of department.

ECONOMICS OF LABOR AND MANPOWER


4430-40 Labor Legislation (3, 3) 4430—Economic background and effects of governmental regulation of labor relations, with emphasis on a description of the National Labor Relations Act as amended. 4440—Development and application of the Fair Labor Standards Act, the Social Security Act, workmen's compensation acts, and related legislation affecting labor relations.


5410 Seminar in Labor Manpower Economics (3) Intensive examination of the major topics contained in the labor-manpower economics literature. Emphasis on problems, analysis and possible solutions. Prereq: Consent of instructor.

5420 Seminar in Wage and Employment Theory (3) An examination of current and past theories of wage and employment determination. Prereq: 5410, equivalent or consent of instructor.

5441-42, 6421-22 Seminar in Labor Economics (3, 3) Selected labor problems chosen for their current interest of continuing significance—development and application of problems and techniques.

Finance

Professors:


Associate Professors:

A. B. Bisce, Jr., Ph.D. Florida; R. A. Bohm, Ph.D. Washington; J. C. Golden, Ph.D. George Washington; W. C. Goosby, Ph.D. Wisconsin (Milwaukee); J. H. Lord, D.B.A. Indiana; R. E. Shriives, Ph.D. California (Los Angeles); D. L. Stevens, Ph.D. Michigan State.

Assistant Professors:

A. L. Auer, Ph.D. Iowa; H. S. Banton, M.S. Auburn; M. Lindahl, Ph.D. Illinois (Champaign-Urbana); R. A. Weir, Ph.D. North Carolina.

5000 Thesis

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

6000 Doctoral Research and Dissertation

FINANCE AND INVESTMENTS

5050 Survey of Finance Functions in Business (3) The scope and nature of managerial finance: financial analysis, planning and control; risk management; capital investments; conceptual and external long-term financing; and working capital management. Prereq: Principles of economics and fundamentals of financial accounting. (Available only as stated on page 35.)

5110 Theory of Financial Management (3) Financial decision-making in the firm with the objective of maximizing shareholder wealth. Emphasis on corporate financial decisions, capital costs and the financing decision, and the dividend decision of the firm. Prereq: [Select one course].

5120 Quantitative Techniques in Financial Management (3) An introduction to the applications of mathematics, probability, and statistics in the field of financial management. Prereq: 5110 and Statistics 5311 or equivalent.

5130 Financial Administration (3) Cases and
5140 Seminar: Managerial Finance (3) Applications of theory and quantitative techniques to the solution of current problems in managerial finance. Prereq: 5110 or 5130.


5210 Theory of Risk Management (3) (For students with no background in risk and insurance.) Study of the theory of risk management and of manageable risks facing the individual and the firm. Analysis of risk management techniques with emphasis on insurance as a tool.

5210 Seminar in Insurance (3) Analysis and discussion of current developments and problems in the fields of life, health, property, liability and social insurance. Emphasis is on vital social issues touching upon the insurance mechanism and philosophy. Prereq: Consent of instructor.

5130 Housing and Urban Land Markets (3) A study of capital formation and the allocation of capital in the housing and land market. Prereq: Finance 5050 or equivalent.

5210-20-30 Real Estate Investment and Taxation Analysis (3) Analysis of economic factors and institutions which underlie real estate investment decision making. Case method is utilized. Prereq: 5120 or consent of instructor.

Industrial and Personnel Management

GOVERNMENTAL FINANCIAL ADMINISTRATION

5210-20 Public Finance (3, 3) Role of the public sector and the problem of social balance, collective and quasicollective goods and their financing under alternative tax programs. Must be taken in sequence. Prereq: Economics 5060 or equivalent.


Management Science

MAJOR

Management Science

DEGREES

M.S., Ph.D.

Associate Professors:

C. E. Bell (Chairman), Ph.D. Yale;
R. S. Garfinkel, Ph.D. Johns Hopkins,
Assistant Professor:

R. E. Rosenthal, Ph.D. Georgia Institute of Technology.

Management Science Committee:

Members of the Management Science faculty and in addition: R. W. Boling, Industrial Management; J. S. Bradley, Mathematics; R. L. Church, Civil Engineering; D. H. Pike, Industrial Engineering; C. C. Thigpen, Statistics.

MASTER OF SCIENCE PROGRAM

The M.S. program in Management Science is designed as preparation for a career in the application of quantitative techniques for the solution of management problems in large organizations. The program's flexibility also makes it appropriate as preparation for doctoral study in Management Science.

Management Science course work will expose students to both the theoretical development of quantitative techniques and their application to managerial decision-making. In addition to the development of sufficient mathematical maturity for creative use of quantitative skills, the program allows concentrated study in an area of application within the College of Business Administration. With the widespread application of management science technology, the student may (with the approval of the Management Science Committee) choose an applied concentration in a field outside the College of Business Administration.

Applications are encouraged from all majors, but mathematical background equivalent to the completion of at least two years of college calculus and proficiency in a computer language (e.g., Computer Science 3150) is required. The program is designed to be completed in one calendar year of full-time study, but applications are also encouraged from prospective part-time students.

Course Requirements

<table>
<thead>
<tr>
<th>Quarter Hours</th>
<th>Management Science 5310-20-30-40</th>
<th>Applied Concentration Area (approved by advisor)</th>
<th>Statistics 5110</th>
<th>Statistics elective (5000-level or above)</th>
<th>Mathematics (4000-level or above)</th>
<th>Electives selected from mathematics, statistics, computer science, and/or management science</th>
<th>Electives in any area approved by advisor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12</td>
<td>12</td>
<td>3</td>
<td>3</td>
<td>6</td>
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<tr>
<td>Total</td>
<td>48</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

A thesis option is available which substitutes nine hours of thesis credit for the following 12 hours of course work: Management Science 5340, one three-hour course in the applied concentration area and six hours of electives in any area. The Management Science Committee will work closely with the student in tailoring a program to his/her needs. The committee must approve a tentative overall program during the student's first quarter and must approve all courses on a quarter-by-quarter basis.

Recognizing the diverse backgrounds and needs of Management Science M.S. students, the Management Science Committee is prepared to waive some of the above requirements on an individual basis. For example, an undergraduate mathematics major with a strong background may be allowed to take six additional hours of electives in place of the mathematics requirement. On the other hand, a student lacking experience in rigorous senior-level mathematics courses will be asked to take additional courses to fulfill the six-hour mathematics requirement. The total course load will remain 48 hours for all non-thesis students and 45 hours for all thesis students; however, the number of hours of electives can be reasonably expected to vary between six and 18 as a function of prior background.

MBA CONCENTRATION

Management Science 5310-20-30-30 forms the nucleus of a 12 to 18 hour concentration in Management Science for MBA students. See pages 34-35 for further MBA details.

DOCTORAL PROGRAM

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

(1) to provide, through management science course work, a thorough knowledge of common Management Science/Operations Research mathematical models and their uses;
(2) to provide sufficient advanced study in an applied concentration area to qualify the graduate for a joint faculty position in the concentration area as well as in management science. The candidate may choose from the business functional areas (accounting, finance, marketing, production management, and transportation and logistics) or other disciplines, e.g., forestry, ecology, and public administration;
(3) to develop in the student, through course work in mathematics, statistics, and computer science, a high degree of mathematical maturity which will serve the graduate well throughout a life-long career, whether in management, research, or teaching.

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

Course Work. A minimum of 72 quarter hours of course work taken for graduate credit (exclusive of thesis or dissertation) is required. The candidate must complete a minimum of 36 quarter hours at The University of Tennessee, Knoxville, at least nine of which must be at the 6000 level. Entering students who have completed graduate studies in applicable fields will be granted course credits for work which is equivalent to required courses in the program.

The program includes approximately 24 to 30 quarter hours of course work in the applied concentration area.

Qualifying Examinations. The student must demonstrate mastery of probability theory and statistical inference (Statistics 5110-20-30) by passing a written qualifying examination or by presenting other evidence of mastery of the material satisfactory to the faculty.

Mastery of 18 quarter hours in mathematics courses must be demonstrated by passing a written qualifying examination or by presenting other evidence of mastery of the material satisfactory to the faculty. Topics normally include matrix methods (Mathematics/Computer Science 5655-65-75) and real analysis (Mathematics 4510-20-30). Other options may be approved.

There is no foreign language requirement.

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

Preliminary Examination. Prior to admission to candidacy for the degree, and normally after completion of the second year of the program, the student must pass a written preliminary 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.

Prerequisites for Management Science Courses. The Management Science Program is interdisciplinary and students in other degree programs are encouraged to enroll in management science courses. Course prerequisites are designed to indicate the level at which courses are taught. Interested students whose prior course work does not match the prerequisites are encouraged to seek the instructor's guidance and consent to enroll.

5000 Thesis

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

5100 Introduction to Management Science Techniques (3) Review of matrix algebra and an introduction to techniques such as mathematical programming, decision theory, and queuing theory. Prereq: Statistics 5311. May not be taken for credit by students who receive credit for 5310.


5340 Application of Management Science Methods (3). Application of methods from 5310-20-30 to large-scale management problems. 5330 may be taken concurrently.

5510 Topics in Optimization (3) In-depth study of one of the following: linear programming, dynamic programming, non-linear programming, optimization theory (convex analysis, optimality conditions, Lagrangean and other dual approaches), Prereq: Consent of instructor; course prerequisites vary with topic. May be repeated. Maximum 9 hrs.

5610 Markovian Decision Models (3) Formulation and analysis of Markov Chain models; Markov Chain models which incorporate decision points; application of solution through policy iteration. Stochastic dynamic programming models in continuous time. Prereq: 5310.

5820 Queuing Models (3) Application and mathematical analysis of models of congestion. Basic birth-death process models, other Markovian models; non-Markovian models for systems with general service or arrival patterns, priority customers or other complicating assumptions; queues in series. Prereq: 5330 or Mathematics 4750-60.

5910 Special Topics in Management Science (5) Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

5910 Management Science Problems (1-6) Directed study on subject of mutual interest to student and staff member.

6000 Doctoral Research and Dissertation

6110-20-30 Models for Production Systems (3, 3, 3) A semester research project to enhance the professional development of doctoral students. Includes investigation of existing mathematical models for production processes and opportunities for original research. Prereq: 5310. 6810 Special Topics (3) Prereq: 5310-20-30 and consent of instructor. May be repeated. Maximum 9 hrs.

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

Marketing and Transportation

Marketing


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

5950 Survey of Marketing (3) Analysis of the marketing system; the institution, functions, and marketing problems. Current trends and developments. (Available only as stated on page 35.)

5200 Marketing Management (3) Management of the basic marketing functions. Case problems and marketing decision simulation. Prereq: 5950 or equivalent.

5220 Promotion Management and Strategy (3) Assessment of communications theories and concepts useful to firms in achieving promotional goals, planning, implementing, and evaluating the firm's promotional program. Social and economic role of persuasive communication. Prereq: 5200 or equivalent.

5230 Analysis and Design of Marketing Systems (3) A macroinstitutional approach to the marketing system. Conceptual framework for examining marketing agency and channel interrelationships, public policy, cost and efficiency, and innovation in marketing from the viewpoint of the decision maker. Prereq: 5200 or equivalent.

5300 Marketing Research (3) Investigation and solution of problems; application of research methods to functional areas of marketing. Research concepts, methods, and techniques.

5410 Marketing Strategy (3) Components of marketing strategy, including design and use of models for the analysis of marketing decisions and processes. Prereq: 9 hrs of graduate marketing.

6110 Seminar in Buyer Behavior Research (3) An examination of the behavior of individuals and groups in their roles as buyers of economic goods and services. Prereq: 5300 or Statistics 5312 or the equivalent, and Industrial Management 5610-20.

6210 Seminar in Marketing Models and Model Building (3) Examination of the nature, concepts, construction, selection, and use of models for the analysis of marketing decisions and processes. Prereq: 9 hrs of graduate marketing.

6310 Seminar in Contemporary Marketing Issues (3) An examination of the fundamental nature of the marketing process and analysis of several topics of current interest in marketing. Specific topic areas will vary with each course offering. Prereq: 9 hrs of graduate marketing, including 5300 and 6110.

Transportation and Logistics


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

5050 Survey of Transportation and Logistics (3) Intensive survey of the logistical demands made by society and specific users upon the nation's transportation system and the problems facing carriers and government in meeting these demands (including problems in a concentration or minor in transportation).

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

5130 Transportation Management Problems
(3) An analysis of significant transportation problem areas with a consideration of proposed solutions.

5210 Business Logistics
(3) Development of concepts to guide the analysis and design of logistics systems. Scope and importance of transportation and spatial decisions in the total strategy. Emphasis on top management integration of physical distribution operations with marketing, production, and other decision areas.

5220 Physical Distribution Strategy
(3) Development and administration of basic logistical policies. Analysis of physical distribution and supply problems with emphasis on executive action. Practical applications through a case approach and simulation game. Prereq: 5010, Statistics 5311.

5510 Urban Transportation Policy
(3) A study of the movement of people, goods and information in urbanized areas with special emphasis on the formulation of national, state and city policy toward the firms providing these services.

5910 Transportation Law and Carrier Liability
(3) Legal rights and responsibilities of carriers and users. Procedures before regulatory agencies and analysis of the regulatory statutes with appropriate agency and court decisions.

5920 Current Topics in Transportation and Logistics
(3) A seminar designed to study, in depth, a current policy or problem area in transportation or logistics. The topic selected will be announced prior to each offering.

5990 Research in Transportation and Business Logistics
(3) Directed independent research on a subject of mutual interest to student and faculty member. Prereq: 12 hrs in transportation.

6000 Doctoral Research and Dissertation

6110 Seminar in National Transportation Policy
(3) A critical analysis of contemporary national transportation policy issues. Prereq: 5110.

6210 Seminar in Transportation and Logistics Models
(3) Analysis of the current quantitative methodologies used in transportation and logistics research. Prereq: Statistics 5311-12, Management Science 5100.

6220 Transportation and Logistic Systems—Analysis and Simulation
(3) Directed independent research, analysis, and simulation of a transportation or logistics system. Prereq: 6210.

Office Administration

Professor:
G. A. Waggoner (Head), M.S. Indiana.

Associate Professors:

Assistant Professors:

5130 Business Letter Writing
(3) Modern business letters; types of letters studied; principles applied by solving letterwriting problems.

4320 Business Report Writing
(3) Report writing, tabular and graphic presentation, basic instruction in formal research reports and thesis writing, sources of business information.

4410-20 Advanced Shorthand and Transcription
(3) Improvement of ability to take dictation and transcribe legible copy; emphasis on skill necessary to meet occupational standards. 3 two-hour periods.

4430 Supervised Office Experience
(3) Orientation to office position through actual office work; telephoning techniques, sources of information required by secretary, record keeping, office etiquette, interviewing, and appropriate dress for office. 2 three-hour periods.

4520 Office Systems
(3) Routines and procedures for handling correspondence and mailing; filing systems; oral communications; office planning and layout; systems of control.

4540 Problems in Office Management
(3) Work simplification; cost control and reduction; development of standards; use and preparation of office manuals. Prereq: office equipment problems, 4520 or consent of instructor.

4551-69 Problems in Office Management
(3, 3) System Analysis
4552-62 Form Design
4553-63 Records
4554-64 Mechanization
4555-65 Correspondence
4556-66 Supervision
4557-67 Work Simplification
4558-68 Training
4559-69 Work Measurement

4710 Punched Card Methods
(3) Card designing, key punching, sorting, tabulating, and preparation of reports; application to problems in fields of accounting, statistics, personnel, economics, psychology, education, and other areas of research. 3 hrs and two 2-hr labs.

4720 Punched Card Applications
(3) Advanced problems on tabulator and collator, introduction to programming, system design, and preparation of procedure manuals and flow charts. Prereq: 4710 or equivalent.

5011 Problems in Lieu of Thesis
(3)

5050 Data Processing in Business
(3) Fundamentals of data processing, computer programming and applications, systems design. (Available only as stated on page 35.)

Statistics

MAJOR

STATISTICS

DEGREES

M.S.

Professors:
C. C. Thigpen (Head), Ph.D. Virginia Polytechnic Institute; D. S. Chambers, M.B.A. Texas; R. A. McLean, Ph.D. Purdue.

Associate Professors:
H. A. Lasater, Ph.D. Rutgers; J. W. Philpot, Ph.D. Virginia Polytechnic Institute; R. D. Sanders, Ph.D. Texas; D. J. Wheeler, Ph.D. Southern Methodist.

Assistant Professors:
W. H. Olson, Ph.D. Virginia Polytechnic Institute; G. B. Ranney, Ph.D. North Carolina; M. S. Younger, Ph.D. Virginia Polytechnic Institute.

MASTER OF SCIENCE PROGRAM

The MS program in Statistics is designed to provide students a basic foundation in theoretical and applied statistics for meaningful careers as consulting and practicing statisticians. A candidate should possess an undergraduate degree with a strong background in calculus, but no restrictions are imposed regarding the undergraduate major. The typical Master of Science degree program in Statistics is as follows:

4110-20 Advanced Shorthand and Transcription
4120 Advanced English Composition
4130 Advanced Legal Research
4140 Advanced Legal Writing
4150 Advanced Legal Method
4160 Advanced Legal Theory

4210 Business Law
4220 Business Organizations
4230 Business Ethics
4240 Business Finance
4250 Business Management
4260 Business Policy
4270 Business Planning
4280 Business Strategy
4290 Business Statistics

4310 Probability Theory
4320 Statistics Theory
4330 Sampling Theory
4340 Experimental Design
4350 Multivariate Analysis
4360 Time Series Analysis
4370 Nonparametric Statistics
4380 Bayesian Statistics
4390 Computational Statistics

4410 Design of Experiments
4420 Experimental Design
4430 Sampling Design
4440 Hypothesis Testing
4450 Regression Analysis
4460 Time Series Analysis
4470 Multivariate Analysis
4480 Nonparametric Statistics
4490 Bayesian Statistics

4510 Work Experience
4520 Professional Practice
4530 Professional Ethics
4540 Professional Development
4550 Professional Communication
4560 Professional Leadership
4570 Professional Networking
4580 Professional Service

4610 Thesis
4620 Dissertation

4710 Punched Card Methods
4720 Punched Card Applications
4730 Computer Programming
4740 Computer Applications
4750 Computer Systems
4760 Computer Networks
4770 Computer Security
4780 Computer Ethics
4790 Computer Law

4810-20 Advanced Shorthand and Transcription
4820 Advanced English Composition
4830 Advanced Legal Research
4840 Advanced Legal Writing
4850 Advanced Legal Method
4860 Advanced Legal Theory

4910 Business Law
4920 Business Organizations
4930 Business Ethics
4940 Business Finance
4950 Business Management
4960 Business Policy
4970 Business Planning
4980 Business Strategy
4990 Business Statistics

5010 Probability Theory
5020 Statistics Theory
5030 Sampling Theory
5040 Experimental Design
5050 Multivariate Analysis
5060 Time Series Analysis
5070 Nonparametric Statistics
5080 Bayesian Statistics

5110 Introduction to Probability Theory
5120 Introduction to Statistics
5130 Introduction to Experimental Design
5140 Introduction to Survey Sampling
5150 Introduction to Time Series Analysis
5160 Introduction to Multivariate Analysis
5170 Introduction to Nonparametric Statistics
5180 Introduction to Bayesian Statistics

5210 Applied Statistics
5220 Statistical Methods
5230 Statistical Computing
5240 Statistical Graphics
5250 Statistical Inference
5260 Statistical Decision Theory
5270 Statistical Quality Control
5280 Statistical Process Control
5290 Statistical Quality Assurance

5310-60 Statistical Theory
5310 Introduction to Probability Theory
5320 Probability Theory
5330 Mathematical Statistics
5340 Statistical Inference
5350 Nonparametric Statistics
5360 Bayesian Statistics
5370 Computational Statistics

5410-20 Advanced Shorthand and Transcription
5420 Advanced English Composition
5430 Advanced Legal Research
5440 Advanced Legal Writing
5450 Advanced Legal Method
5460 Advanced Legal Theory

5510 Business Law
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5660 Time Series Analysis
5670 Nonparametric Statistics
5680 Bayesian Statistics

5710-20 Advanced Shorthand and Transcription
5720 Advanced English Composition
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5740 Advanced Legal Writing
5750 Advanced Legal Method
5760 Advanced Legal Theory

5810 Business Law
5820 Business Organizations
5830 Business Ethics
5840 Business Finance
5850 Business Management
5860 Business Policy
5870 Business Planning
5880 Business Strategy
5890 Business Statistics

5910 Probability Theory
5920 Statistics Theory
5930 Sampling Theory
5940 Experimental Design
5950 Multivariate Analysis
5960 Time Series Analysis
5970 Nonparametric Statistics
5980 Bayesian Statistics

College of Business Administration


5211 Elementary Statistics (3) Introductory statistics for graduate students. Probability, sampling distributions, estimation, and hypothesis testing. Emphasis on interpretation and decision making. Not available for credit in any College of Business Administration degree program.


5312 Statistical Methods (3) Significance testing, applications of the Chi-square statistic, analysis of variance, least squares and linear regression. Prereq: 5311.

5420 Intermediate Analysis of Variance (3) Design models; factorial, split-plot, and nested designs; covariance analysis. Prereq: 5312 or equivalent.

5610 Special Topics in Statistics (3) Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

6060 Applied Multivariate Analysis (3) Canonical correlation; discriminant analysis for several groups, and for equal and unequal covariance matrices; principal component analysis; Hotelling’s T²; multi-variate analysis of variance and covariance. Prereq: One year’s course work in applied statistics, including analysis of variance and multiple regression analysis.

6070 Factor Analysis (3) Principal component analysis and principal factor analysis; estimates of communalities; methods of rotation; interpretation of factors; cluster analysis. Prereq: 5060.

6210 Stochastic Processes II (3) Special analysis, time series, linear and nonlinear systems. Prereq: 5210.
The College of Communications offers two graduate degrees with a major in Communications, the Master of Science (M.S.) degree and the Doctor of Philosophy (Ph.D.) degree.

In addition, communications is available as a minor for students majoring in other departments. Required course work will be selected after discussion with the major advisor and an advisor from the College of Communications.

The College is accredited by the American Council on Education for Journalism. It is a member of the American Association of Schools and Departments of Journalism and the Broadcast Education Association.

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

MASTER OF SCIENCE

The Master of Science degree with a major in Communications is offered for students who primarily desire (1) advanced preparation in effective communication for print or broadcast media, (2) knowledge of mass media advertising and management, (3) an understanding of the social role of the press, or (4) preparation for teaching communications.

The prospective student who is interested only in acquiring basic skills in journalism, advertising, or broadcasting is advised to consider a second baccalaureate rather than an advanced degree.

Applicants must meet admission requirements of the University Graduate School. Those lacking approved credits in communications (advertising, broadcasting, and journalism) must complete at least 15 prerequisite or supplemental hours of courses offered by the College of Communications and approved by the major advisor.

In addition, the following minimal requirements normally are specified for admission to potential candidate status in the Master of Science program in the College of Communications: a) an undergraduate B average, b) an above average verbal aptitude score on the Graduate Record Examination, and c) such other evidence of qualifications as may be required by the Graduate Studies Committee. Students are admitted to the program only for summer and fall quarters each year. Applications for the graduate program, including all necessary materials that are not received at least six weeks before registration may not be processed in time for admission to full potential candidate status in the first quarter. In these cases, the student may still qualify for non-degree or post-baccalaureate status.

The degree program has two options: the thesis option requires 45 hours of approved graduate work:

- 24 hours of approved courses in the major, including Communications 5100, 5120, 5140, and 6100, at least 9 hours in one concentration area (advertising, broadcasting, journalism), and at least 15 hours at the 5000 level;

- 9 hours of thesis work;

- at least 12 hours in a minor area approved by the major advisor, at least six of which must be at the 5000 level.

(If a candidate submits evidence of record that he/she has satisfied the objectives of thesis research, the student may then petition to be exempt from the thesis and to substitute 9 hours of 5000-level communications courses approved by the committee.)

After the student completes the formal program of courses and research, the student must pass an oral examination conducted by his/her graduate committee.

The non-thesis option requires completion of 45 hours of approved graduate work:

- 33 hours of approved courses in communications, including Communications 5100, 5120, and 5140, at least 12 hours in one concentration area (advertising, broadcasting, journalism), and at least 15 hours at the 5000 level;

- at least 12 hours in a minor area approved by the major advisor, at least six of which must be at the 5000 level;

- completion of an approved communications project (no more than one inde-
**Department of Communication**

**Graduate Studies, or 3.5 for graduate work**

**Core Curriculum (33 hours)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
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<tbody>
<tr>
<td>5100</td>
<td>Introduction to Graduate Studies</td>
</tr>
<tr>
<td>5140</td>
<td>Communications Theory</td>
</tr>
<tr>
<td>5120</td>
<td>Research Methods</td>
</tr>
<tr>
<td>6100</td>
<td>Seminar in Communications Theory</td>
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<tr>
<td>6200</td>
<td>Seminar in Communications Topics</td>
</tr>
<tr>
<td>6300</td>
<td>Survey Research Methods in Communications</td>
</tr>
<tr>
<td>6310</td>
<td>Experimental Research Methods in Communications</td>
</tr>
<tr>
<td>6320</td>
<td>Seminar in Historical Research Methods in Communications</td>
</tr>
</tbody>
</table>

**Technical Competence Area**

- **Communications**
  - 15-18 hours of course work
- **Technical Competence Area**
  - 3 hours of technical course work

**Additional Requirements**

- **Admission**
  - Must demonstrate ability to use computer
  - Preferable: Master's degree
  - Minimum 3.0 GPA

- **Other Requirements**
  - Research tool: 12 hours of course work
  - Technical competence: 33 hours of course work

**Advising**

- Advisor for applicants lacking the necessary academic and/or professional background

**Course Descriptions**

- **5100** Introduction to Graduate Studies
- **5140** Communications Theory
- **5120** Research Methods
- **6100** Seminar in Communications Theory
- **6200** Seminar in Communications Topics
- **6300** Survey Research Methods in Communications
- **6310** Experimental Research Methods in Communications
- **6320** Seminar in Historical Research Methods in Communications

**Emphasis Areas**

- **Communications**
  - Advertising
  - Journalism
  - Public Relations

**Additional Information**

- **Non-Thesis Graduation Completion (3)**
- **Thesis Graduation Completion (3)**
3650 Radio-Television Writing (3) Theory and practical application of writing copy and scripts for radio and television. Emphasis on the role of the press in its relationship to communications media, and consumer research; development and implementation of advertising ideas. Prereq: Advertising Principles, Marketing Communications II or consent of instructor.

4000 Advanced Advertising Writing and Copy Layout (4) Creative strategy and execution of advertising copy and scripts except news and dramatics. Specialized lectures by commercial broadcasters. Prereq: Introduction to Broadcasting or consent of instructor.

4670 Radio-Television Management (3) Business policies, gatekeeping networks and local stations. Departmental functions, cost and income figures, sales techniques, promotion, advertising agencies, and governmental regulations. Specialized lectures by commercial broadcasters. Prereq: Introduction to Broadcasting or consent of instructor.

4680 Broadcast Sales Management (3) Problems and practices of radio and television sales, including case studies in sales development, personnel utilization, and problem areas of sales management. Prereq: Introduction to Broadcasting or consent of instructor.

5410 Educational Broadcasts (3) Analysis, application, and evaluation of television and radio broadcasting for educational purposes.

5510-20-30 Creative Projects (3, 3, 3) For students who wish to apply theory and skills to specific problems in advertising. Prereq: 4460 or consent of instructor.

5520 Broadcast Law and Regulations (3) Sociopolitical control of broadcasting; effect of laws, regulations, and public pressures upon station policies. Prereq: Journalism 4410 or consent of instructor.


5610 Mass Media and Society (3) Role of mass media in relation to communications needs of society, and the influence of public opinion. Prereq: Introduction to Broadcasting or consent of instructor.

5810 Mass Media and the Law (3) Advertising, and postal regulations. Prereq: Writing for Mass Media or consent of instructor.

5910 News and Feature Photography (3) Advertising, and postal regulations. Prereq: Writing for Mass Media or consent of instructor.

6100 Journalism in the High School (3) Functions and methods of high school publications. Staff organization, writing and editing techniques, editorial problems, and business management.


6200 Broadcast News Operation (3) Theory and practice of writing copy and scripts for radio and television. Emphasis on the role of the press in its relationship to communications media, and consumer research; development and implementation of advertising ideas. Prereq: Advertising Principles, Marketing Communications II or consent of instructor.

6210 Writing Feature Articles (3) Fundamentals of today's broadcast conditions as they affect the professional broadcaster. Prereq: Introduction to Broadcasting or consent of instructor.

6220 Writing Feature Articles (3) Writing feature articles for newspapers, trade journals, and magazines. Market analysis and free-lance selling. Prereq: Writing for Mass Media or consent of instructor.

6310 Communications Law (2) Statutory law and judicial precedents affecting mass communications media. Libel, contempt of court, invasion of privacy, copyright, broadcasting, advertising, and postal regulations.

6330 Investigative and Specialized Reporting (3) Investigative and interpretative reporting of complex or specialized subjects to place news in perspective or to clarify situations. Emphasis on writing for publication. Prereq: Reporting.

6370 Public Relations (3) Theories and principles of public relations. Overview of PR as a management tool of business, government, institutions, and organizations.

6370 Public Relations (3) Theories and principles of public relations. Overview of PR as a management tool of business, government, institutions, and organizations.

6410 Editorial Writing (3) Analysis of editorial policies, practices, pages, and practice in writing editorials, columns, paragraphs, and interpreted stories. Prereq: Introduction to Broadcasting or consent of instructor.

6430 Reporting Public Affairs (3) Instruction and practice in reporting news of courts, politics, government, finance, labor, and social agencies. Prereq: Editing for Mass Media.


6470 Broadcast News Operation (3) Theory and practice of writing copy and scripts for radio and television. Emphasis on the role of the press in its relationship to communications media, and consumer research; development and implementation of advertising ideas. Prereq: Advertising Principles, Marketing Communications II or consent of instructor.

6490 Writing for Mass Media (3) Daily and weekly newspaper business operations. Current developments in newspaper management.

6510-20-30 Creative Projects (3, 3, 3) For students who wish to apply theory and skills to specific problems in advertising. Prereq: 4460 or consent of instructor.
A course serving students with specialized writing or editing interests, such as agriculture, politics, labor, finance, science, for technical as well as general publications. Prereq: Reporting or Editing for Mass Media.

5560 Magazine Article Writing (3) Techniques of writing the in-depth article for mass circulation magazines. Methods of organizing and presenting material. Problems in specialized areas, such as business, science, agriculture, the humanities. Prereq: 3120 or consent of instructor.

5710 Studies in Public Relations Communications (3) Detailed examination of the problems of communication between institutions and organizations and their publics. Case histories and evaluations of programs. Prereq: 3710 or consent of instructor.

5970 Independent Study (3)
The faculty of the College of Education is committed to performing three major functions: (1) to provide professional preparation for teachers, administrators, and school service personnel at undergraduate and graduate levels; (2) to collaborate with school personnel, educational agencies, professional groups, and others interested in the evaluation and improvement of educational opportunities, programs, and services; and (3) to promote and conduct experimental and research studies in education.

The College of Education holds membership in the American Association of Colleges for Teacher Education. All certification and degree programs through the doctoral level are fully accredited by the National Council for Accreditation of Teacher Education, the Southern Association of Colleges and Schools, and the Tennessee State Department of Education.

The College of Education, through the Graduate School, offers programs leading to the Master of Arts in College Teaching, the Master of Science degree, the Master of Education degree, the Specialist in Education degree, and the Doctor of Education and Doctor of Philosophy degrees.

**MASTER OF SCIENCE**

On the Master's level professional study may be planned (1) in one of the areas listed on page 8, (2) in appropriate combinations of these areas, or (3) in combinations of one or more of these areas with appropriate subjects or areas in other colleges.

**SPECIALIST IN EDUCATION DEGREE**

This degree may be earned in educational administration and supervision, in educational psychology and guidance, in curriculum and instruction, in safety education and service, or in vocational-technical education.

**DOCTORAL DEGREES**

The College of Education offers programs of advanced study leading to the Doctor of Education degree in the major areas listed on page 8, and to the Doctor of Philosophy degree in Health Education.

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**Bureau of Educational Research and Service**

Four major types of activities—research, development, educational services, and publications—are channeled through the Bureau of Educational Research and Service (BERS), located in Claxton Education Building. The research activities relate to the development of research proposals, conducting research, and assisting others in development of research proposals in the College of Education. Developmental activities relate to change efforts in curricular content and instruc-

mental methodology. Educational services include a wide list of activities such as in-service educational programs, consultant services, educational services, and administrative training programs. Official publications of the College of Education are developed through the Bureau. A limited number of graduate student assistantships are available.

The Educational Opportunities Planning Center and the School Planning Laboratory are integral parts of the Bureau of Educational Research and Service.

**EDUCATIONAL OPPORTUNITIES PLANNING CENTER**

The Educational Opportunities Planning Center (EOPC) works with school districts in the Tennessee-Kentucky area to help meet their desegregation and sex discrimination needs by assisting with needs assessment and by helping develop plans to meet the needs. Staff members provide in-service training for local district personnel. Such training is directed toward solutions of curricular, human relations, and other types of problems created or compounded by school desegregation and sex discrimination. On-site evaluation of locally installed practices and continuing cooperative evaluation of the progress of local programs are additional major efforts. This program is funded by the U.S. Office of Education.

**SCHOOL PLANNING LABORATORY**

The School Planning Laboratory (SPL), located in Claxton Education Building, assists schools and colleges in integrating curriculum offerings with architectural designs, organizing regional institutes to promote innovative construction concepts, encouraging full staff utilization to secure an optimal learning environment, facilitating renovative projects within existing buildings, and conducting custodial clinics on proper maintenance techniques. Course