University Calendar For 1982-83

Winter Quarter, 1982
January 4-5 (Monday-Tuesday)
January 6 (Wednesday)
January 7-11 (Monday-Friday)
January 12 (Saturday)
January 13-17 (Monday-Friday)
January 18 (Saturday)
January 19-21 (Monday-Wednesday)

Spring Quarter, 1982
March 25-26 (Thursday-Friday)
March 27 (Saturday)
March 28-30 (Monday-Wednesday)
April 2-3 (Thursday-Friday)
April 4 (Saturday)
April 5-7 (Monday-Wednesday)
April 8 (Thursday)
April 9-11 (Monday-Wednesday)
April 12 (Thursday)
April 13-15 (Monday-Wednesday)
April 16 (Thursday)
April 17-19 (Monday-Wednesday)
April 20 (Thursday)
April 21-23 (Monday-Wednesday)
April 24 (Thursday)
April 25-27 (Monday-Wednesday)
April 28 (Thursday)
April 29 (Friday)

Summer Quarter, 1982
June 17-18 (Thursday-Friday)
June 19 (Saturday)
June 20-22 (Monday-Wednesday)
June 23 (Thursday)
June 24-27 (Monday-Thursdays)

Fall Quarter, 1982
September 20-22 (Monday-Wednesday)
September 23 (Thursday)
September 24-26 (Monday-Wednesday)
September 27 (Thursday)
September 28 (Friday)

Winter Quarter, 1983
January 3-4 (Monday-Tuesday)
January 5 (Wednesday)
January 6-10 (Monday-Friday)
January 11 (Saturday)
January 12-15 (Monday-Thursdays)

NOTE: Deadlines for degree requirements described on pp.
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Where To Write

The University of Tennessee,
Knoxville
Knoxville, Tn 37916
Office Hours: 8:00 a.m.-5:00 p.m.
Monday-Friday

The Graduate School

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

15 Proficiency Examinations
  English Proficiency
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  The University Library
17 Computing Center
  Office of International
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  Ombudsman

Graduate Research Centers and
Institutes

17 Energy, Environment,
  and Resources Center
  Transportation Center
  Space Institute
18 Water Resources
  Research Center
  Off-Campus
  Graduate Centers

Financial Assistance

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

Housing

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

Handicap Student Services

Counseling Services,
  900 Volunteer Boulevard

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49 College of Education
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97 College of Liberal Arts
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  Knoxville Unit
144 College of Nursing
147 School of Architecture
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  Information Science
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International Student Affairs

Dixon Johnson, 201 Alumni Hall

Registrar

Bob L. Cochran, 215 Student Services
  Building

Timetable of Classes

Supervisor of Registration,
  Registrar’s Office

Veterans’ Benefits

209 Student Services Building

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.

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

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

Inquiries concerning Title IX and Section 504 should be directed to the Office of the Vice Chancellor for Planning and Administration, 525 Andy Holt Tower, 974-4291. Charges of violation of the above policy should also be directed to the Office of the Vice Chancellor for Planning and Administration.
The Graduate School Administration

L. Evans Roth, A.B., M.S., Ph.D., Vice Chancellor for Graduate Studies and Research
Clarence W. Minkel, B.A., M.A., Ph.D., Dean for Graduate Studies
Mary P. Richards, B.A., M.A., Ph.D., Assistant Dean for Graduate Studies
Maria P. Peterson, B.A., M.A., Ph.D., Dean for Research
Thomas L. Bell, B.A., M.A., Ph.D., Assistant Dean for Research
Diana C. Lopez, B.S., M.S., Director, Graduate Admissions
Ben Granger, B.A., M.S.W., M.P.A., Ph.D., Dean, School of Social Work
Charles H. Weaver, B.S., M.S., Ph.D., Dean, UT Space Institute
A. A. Mason, B.S., Ph.D., Associate Dean, UT Space Institute
Marvin Goodman, B.S., M.S., Director, Kingsport Graduate Program
Alexander Hollaender, A.B., A.M., Ph.D., Director, Archival Center for Radiation Biology
David A. Johnson, B.A., M.C.P., Ph.D., Director, Graduate School of Planning
W. Edgar Barnett, B.S., M.S., Ph.D., Director, UT-Oak Ridge Graduate School of Biomedical Sciences
William F. Brandes, M.S., P.E., Director, Water Resources Research Center
Jerry D. Westbrook, B.E., M.S., Ph.D., Director, Nashville Graduate Engineering Program and Oak Ridge Resident Graduate Program
Ann E. Prentice, A.B., M.L.S., D.L.S., Director, Graduate School of Library and Information Science
Kenneth W. Heathington, B.S., M.S., Ph.D., Director, Transporation Center
Edward Lumsdaine, B.S., M.S., Ph.D., Director, Energy, Environment, and Resources Center

The Graduate Council

Membership January 1, 1981

Ex Officio Members
L. Evans Roth, Vice Chancellor
Clarence W. Minkel, Dean
Thomas Hood, Chairperson for Research Council
Pauline S. Bayne, President, Faculty Senate

Appointed Members
Dr. Michael E. Gordon
Dr. Kenneth Heathington
Dr. David A. Johnson
Dr. Richard J. Courtney

College or Unit  Elected Members  Date of Expiration  Proxy
Col. of Agriculture  Dr. Luther Wilhelm  Dec. 31, 1983  Dr. Curtis Melton
Dr. Jan R. Williams  Dec. 31, 1981
Dr. Charles B. Garrison  Dec. 31, 1982

Col. of Bus. Admin.  Dr. Alan D. Fletcher  Dec. 31, 1982
Dr. John Peters  Dec. 31, 1981
Dr. John Ray  Dec. 31, 1982
Dr. Schuyler Hunk  Dec. 31, 1982
Dr. Lester Knight  Dec. 31, 1983
Dr. John Lovell  Dec. 31, 1983

Col. of Engineering  Dr. Bruce R. Dewey  Dec. 31, 1981
Dr. Mancil Milligan  Dec. 31, 1983

Col. of Communications  Dr. Imogene Ford  Dec. 31, 1981
Dr. Patricia L. Walne  Dec. 31, 1982
Dr. John H. Fisher  Dec. 31, 1982
Dr. T. McN. Simpson  Dec. 31, 1982

Col. of Education  Mr. Kurt Steiner  Apr. 30, 1981
Mr. Thomas L. Walden  Apr. 30, 1981

Graduate Student Council  Dr. Sylvia E. Hart  Dec. 31, 1983
Dr. Robert M. Nooe  Dec. 31, 1981
Dr. Gideon Fryer  Dec. 31, 1983


The University of Tennessee

Board of Trustees

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

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Buford Goldstein, Elizabeth
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Scott Probasco, Jr., Lookout Mountain
William M. Johnson, Sparta
Marcia A. Echols, Nashville
Ben S. Kimbrough, Clarksville
T. O. Lashlee, Humboldt
Tom Elam, Union City
R. Lee Winchester, Memphis

From Anderson, Bedford, Coffee, Franklin, Lincoln, Moore, and Warren Counties
Charlotte Parish June 1, 1988
Elaine McReynolds June 1, 1984
Paul J. Kinser June 1, 1987
Ann Baker Furrow, James A. Haslam, III June 1, 1989
Sam Cooper June 1, 1990
Jack Craddock June 1, 1990

From Davidson County
Elaine McReynolds June 1, 1984
From Hamilton County
Paul J. Kinser June 1, 1987
From Knox County
Ann Baker Furrow June 1, 1989
James A. Haslam, III June 1, 1989
From Shelby County
Sam Cooper June 1, 1990
Jack Craddock June 1, 1990

Student Member
Pamela A. Moon July 1, 1982

TERM EXPIRES
June 1, 1984
June 1, 1986
June 1, 1988
June 1, 1987
June 1, 1982
July 1, 1990
June 1, 1988
June 1, 1986
June 1, 1984

TERM EXPIRES
June 1, 1990

Officers of the Board
Governor Lamar Alexander, Chairman
Ann Baker Furrow, Vice Chairman
Edward J. Boling, President
Brodie Baynes, Treasurer
Beauchamp Brogan, Secretary
Linda Logan, Assistant Secretary

From Weakley County
James F. Harrison June 1, 1990

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Beauchamp E. Brogan, B.S., B.A., J.D., General Counsel, Secretary of Board of Trustees
Andrew J. Kozar, B.S., A.M., Ph.D., Executive Assistant to the President
Brodie Baynes, B.S., C.P.A., Treasurer

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Horner S. Fisher, B.S., M.B.A., Vice Chancellor for Business and Finance
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Roy F. Knight, B.A., M. Arch., Dip. D’Etudes, Dean of the School of Architecture
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William H. Coffield, B.S., M.A., Ph.D., Dean of the College of Education
Robert E. Weaver, B.S., A.M., M.S., Ph.D., Dean of the College of Engineering
Nancy H. Beick, B.S., M.S., Ph.D., Dean of the College of Home Economics
Kenneth L. Penegar, B.A., M.A., Ph.D., Dean of the College of Law
Robert G. Landen, A.B., A.M., Ph.D., Dean of the College of Liberal Arts
Sylvia E. Hart, B.S.N., M.S.N., Ph.D., Dean of the College of Nursing
Hyram Kitchen, M.S., D.V.M., Ph.D., Dean of the College of Veterinary Medicine
Joseph P. Godard, B.S., M.S., Ed.D., Dean of the Division of Continuing Education
John J. McDow, B.S., M.S., Ph.D., Dean of Admissions (Undergraduate) and Records
## Majors and Degrees Available

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<thead>
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<th>MAJOR</th>
<th>DEGREE</th>
<th>ADMISSION TEST REQUIRED</th>
<th>GMAT</th>
<th>ADDITIONAL REQUIREMENTS</th>
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<td>Agricultural Economics</td>
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<td>*Animal Science</td>
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<td>*Forestry</td>
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<td>Ornamental Horticulture and Landscape Design</td>
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<td>*Accounting</td>
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<td>*Statistics</td>
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<td>*Communications</td>
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<td>Business Education</td>
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<td>Curriculum</td>
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<td>Curriculum and Instruction</td>
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<td>Reading Education</td>
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<td>*Child and Family Studies</td>
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<tr>
<td>*Consumer Studies and Housing: Public Policy</td>
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<td>*Food Science</td>
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*Non-degree and provisional students must obtain permission from the department/program head in order to register for courses in these fields.

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

L. Evans Roth, Vice Chancellor for Graduate Studies and Research
Clarence W. Minkel, Dean for Graduate Studies
Maria P. Peterson, Dean for Research
Thomas L. Bell, Assistant Dean for Research
Mary P. Richards, Assistant Dean for Graduate Studies

The University of Tennessee, Knoxville is the official land-grant institution for the State of Tennessee. It is a comprehensive institution offering a wide range of graduate programs leading to the Master's and doctoral degrees. The University offers Master’s programs in 119 fields of specialization and doctoral work in 49. Approximately 6,500 graduate students are enrolled both on and off campus.

Administration of graduate student policies and procedures, and associated record keeping, is the responsibility of the Dean for Graduate Studies. Much of the day-to-day administration of graduate study is conducted by department heads or faculty advisors and committees responsible for particular programs. In addition to departmental units, numerous interdisciplinary programs, institutes and centers have been developed on campus and in locations around the state.

The Graduate School brings together faculty and graduate students as a community of scholars with a common interest in creative work and advanced study. Graduate programs are available to students desiring full-time work toward the Master's and doctoral degrees or professional certification, those interested in continuing education for updating and broadening knowledge, and those pursuing postdoctoral research. Traditionally, universities have provided graduate programs primarily for full-time, degree-oriented students. Serving the needs of students engaged full-time in intensive study and pursuit of a degree continues to be a major emphasis of UT’s graduate effort. At the same time, the University employs a variety of modes, traditional and non-traditional, in offering quality programs designed to serve students.

The policies of The Graduate School are made by the Graduate Council, a body composed of elected representatives from each college, the School of Social Work, the Space Institute, the Graduate Student Council, and five members appointed by the Vice Chancellor for Graduate Studies and Research. Ex-officio members include the Vice Chancellor, the Dean for Graduate Studies, the Assistant Deans for Graduate Studies, and the Chair of the Research Council. The Graduate Office develops procedures to carry out the policies made by the Council, and has primary responsibility for Graduate School admissions and records.

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

Admission and Registration

Admission to The Graduate School requires a Bachelor's degree with a satisfactory grade point average from a college or university accredited by the appropriate regional accrediting agency. Admission to The Graduate School does not insure acceptance into a specific degree program nor admission to candidacy for the degree desired.

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

The Graduate School. If a student does not enroll within one year after the requested admission, he/she must repeat the application process.

Types of Admissions

Admission to a Graduate Degree Program:

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

In addition to meeting the minimum requirements for admission to The Graduate School, applicants at the doctoral level must have demonstrated a potential for superior academic performance. To be considered are such criteria as performance in prior undergraduate and/ or graduate studies, achievement on admission tests for graduate studies, letters of recommendation from professors familiar with the applicant’s capabilities, and similar evidences of scholarly achievement.

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

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

1. do not desire to pursue a degree program;
2. have received an advanced degree;
3. need additional time to fulfill application requirements for a degree program.

There is no specific limit on the number of courses that a student may take in non-degree status. However, within 18 hours of graduate course work in this status, the student must either:

1. apply and be admitted to a specific degree program (see Change of Program, p. 15, for instructions); or
2. file a Plan of Study form with the Graduate Office for approval to continue taking courses in non-degree status. The plan of study must include a stated educational objective and a list of courses proposed to achieve that objective.

A maximum of 18 graduate hours taken before acceptance into a degree program may
be applied toward a graduate degree, if approved by the student's committee. Courses applied toward any graduate degree must fall within the time limit specified for the degree.

The graduate application, $10 application fee, and two (2) official transcripts from each institution previously attended are required for consideration as a non-degree student. The minimum requirements are a Bachelor's degree with a 2.5 grade point average on a 4.0 scale (or a 3.0 the senior year) from a college or university accredited by the appropriate regional accrediting agency.

A major area does not have to be declared, but some departments will not permit non-degree students to register for graduate courses. (See pages 8-9 for information on restricted programs.) Applicants should contact the Graduate Office or the department concerning registration for specific courses. Permission for registration in courses allowed may be obtained from the department or from The Graduate School.

Admission to the non-degree status does not assure admission to a degree program. The student who hopes to enter a degree program will be directed to the appropriate department. Students must maintain a 3.0 grade point average in all course work (graduate and undergraduate) taken in the summer or fall quarters. If a student is admitted to the non-degree status, the student must submit the Request for Revision of Graduate Program form to the Graduate Office.

Permission to register in courses allowed may be obtained from the department or from The Graduate School. A student who hopes to enter a degree program will be directed to the appropriate department.

The student who fails to complete provisional admission within seven weeks after registration will NOT be permitted to register again. A copy of all course transcripts showing the course work taken, until all admission requirements are met.

An international student on a non-immigrant visa may not enroll in the provisional status. Admission of International Students: The Graduate School can accept only students that have outstanding records. An international student must have the equivalent of at least a B average on undergraduate course work. The Graduate School will be directed to the appropriate department.

Other grading systems will be evaluated upon receipt of transcript. An international student may apply only for the summer or fall quarters. If a student is transferring from a U.S. or Canadian institution, an exception may be made to enter the winter or spring quarters. Requests must be made in writing by the student and endorsed by the UT graduate school (or, if applicable, the student). The Graduate School must be notified if a change in the admission date occurs.

An applicant must present: (1) official school or university records, with certified English translations if the records are not in English. (Notarized copies are not acceptable.); (2) documented evidence of financial resources sufficient to support the student with at least U.S. $8,800 per calendar year during the period of registration as a student; and (3) certification of English proficiency. Every student whose native language is not English must either submit a score of at least 525 on the Test of English as a Foreign Language (TOEFL), taken within the last two years, or have received a degree from an accredited U.S. institution in order to gain admission. The application, $10 application fee, official transcript(s), test results (if required), and all other required documentation must be submitted to the Graduate Office by August 1 for the fall quarter and May 1 for the summer quarter. No action can be taken until all a file is completed. The applicant will be notified by mail of the action taken.

To apply for admission the following materials must be sent to The Graduate School:

1. The completed Graduate Application for Admission (inside front cover of Graduate Catalog).
2. A $10 application fee.
3. Two copies of official transcripts from all colleges and universities attended.
4. Reference letters or rating forms (pages 8-9). Forms obtained from the college or department should be returned to the same source.
5. Scores from examinations which may be required for admission.

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

Application forms for the above test can be obtained by writing:

Educational Testing Service
Princeton, NJ 08540

UTK is an approved testing center for all examinations. Examination results reach the University in approximately six weeks.

All of the above documents become the property of the University and will not be returned.

Readmission

A student who has not attended The Graduate School at UTK for more than five quarters (including Summer Quarter) must apply for readmission. A readmission application should be submitted to the Graduate Office at least two weeks prior to the desired reentry date. A student who has attended another institution since enrollment at UTK must submit two official transcripts showing all course work and any degrees earned at that institution. The student will be notified by The Graduate School when action has been taken. A student who is permitted to enroll and is subsequently denied readmission has been taken. A student who is permitted to enroll and is subsequently denied readmission will receive credit for courses completed successfully. Future registration will not be allowed until readmission is granted.

Registration Procedures

Dates of registration are listed in the University Calendar (front of Catalog). To register, students should:

1. Report to the Graduate Office to obtain registration materials (scan form and Timetable of Classes).
2. Confer with an advisor assigned by the department to obtain approval of a schedule of courses and to have the scan form signed.
3. Return scan form to the Graduate Office or alternate location designated in Timetable.
4. Consult Timetable to complete registration.

Non-degree or provisional students in unrestricted programs (see pages 8-9) may obtain permission to register from the Graduate Office.

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

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

Family Educational Rights and Privacy Act

This act provides for confidentiality of student records; however, it also provides for basic identification of all students at UTK. Release of information to third parties includes directory information such as contained in the campus telephone book and sports brochures. Such information may include name, address, telephone number, date and place of birth, major, dates of attendance and awards, the most recent previous educational agency or institution attended, participation in school activities and sports, and height and weight (for special activities).

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

Student Identification Number

UTK requires assignment of an individual student number for internal identification of each student's record. The University began using the social security number as the student identification number prior to January 1, 1975; therefore, the federal law allows continued use of this number. However, if a student does not desire the social security number to be used, notification to the University must be made at the time of application for admission; a student identification number will be assigned instead. For prompt and accurate retrieval of records and for conducting business about their own records, students and alumni must give their student identification number. Student identification numbers, whether a social security number or an assigned number, are used administratively within the University only and are not given to third parties without expressed consent of the student.

Fees, Residency Classification, and Financial Aid

University Fees

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

APPLICATION FEE: $10

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

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

MAINTENANCE FEE (all students): PER QUARTER $263

TUITION (additional for Out-of-state students): PER QUARTER $510

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
$38 per quarter hour or fraction thereof; minimum charge $114.

Out-of-State
$98 per quarter hour or fraction thereof; minimum charge $264.

UNIVERSITY PROGRAMS AND SERVICES FEE:

PER QUARTER $36

All graduate students taking more than 8 quarter hours per quarter will be assessed a University programs and services fee of $36 per quarter. Part-time students taking fewer than 9 quarter hours 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 $29. Part-time students taking fewer than 9 quarter hours 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 pay the appropriate University Programs and Services Fee.

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

Knoxville campus students taking a course load of 6-8 hours may elect to pay the full programs and services fee.

Knoxville campus day students taking a course load of 3-8 hours may elect to pay the $11 student health fee plus the appropriate part-time programs and services fee. The student health fee is included in the full $36 programs and services fee.

This fee is not refundable.

LATE REGISTRATION FEE:

All students are required to have a valid fee receipt to complete the registration procedure. This includes students whose fees are billed, prepaid, or waived. Students who do not complete registration on the regular dates scheduled for this purpose will be charged a late registration fee of $2 up to $5. See the University General Catalog for the University programs and services fee.

Doctoral degree candidates $46

Master's degree candidates $16

There is no additional charge for dissertation credit. The graduation fee is charged a late fee of $35 for each quarter of retroactive registration. The payment of fees with a check which is not honored by the bank will incur a service charge of $10 to $45, depending on the date the check is redeemed.

MUSIC FEE:

One-half hour lesson per week, per quarter $20

One-hour lesson per week, per quarter $40

Payable at registration by students receiving individual instruction in music.

GRADUATION FEE:

Master's degree candidates $16

Doctoral degree candidates $46

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

DEFERRED PAYMENT SERVICE FEE: $5

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

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

FEES FOR COURSES NOT TAKEN FOR CREDIT:

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

REFUND OF FEES FOR WITHDRAWAL:

Withdrawal from school for the quarter after receiving a schedule may be by official notification to the Withdrawal Office, Student Counseling Services Center, 900 Volunteer Boulevard, whether or not fees have been paid, classes have been attended, or the schedule is incomplete. Failure to attend class will be considered as withdrawal and fees will be charged for hours continued plus the percentage assessed for the hours dropped results in an additional charge or refund. Other errors in fee or rental payments by appropriate action will be corrected before the first official day of classes for the quarter. Failure to notify the Withdrawal Office promptly when withdrawing could result in a larger fee assessment. Withdrawal does not cancel fees and charges already incurred.

The drop/add procedure may not be used to withdraw from school for the quarter.

For a regular academic quarter, withdrawal within 7 calendar days beginning with the first day following regular registration permits a 90 percent fee refund. Withdrawal between 8 and 14 calendar days following regular registration permits a 70 percent fee refund. Withdrawal between 15 and 21 calendar days following regular registration permits a 50 percent fee refund. Withdrawal between 22 and 28 calendar days following regular registration permits a 30 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. Refunds, in accordance with the withdrawal refund policy, will be made after the drop deadline.

Part-time students may pay fees computed at the appropriate quarter-hour rate for the quarter. Tuition and fees are charged at the appropriate quarter-hour rate for the hours continued plus the percentage assessed for the hours dropped results in an amount less than that paid. A course on a student's schedule is officially dropped and becomes effective on the date that the change of registration form is processed on a drop/add terminal. Any refund due for dropped courses will be made after the final audit at the end of the quarter.

When a student withdraws, rental charges and adjustments will be determined by the Office of Residence Halls in accordance with the terms of the housing agreement or contract.

SUMMER QUARTER FEES AND EXPENSES:

Fees and expenses for the summer quarter are the same as for the other quarters during the academic year with the exception of the University programs and services fee as noted above.

Although the summer quarter is divided into terms of varying lengths, tuition, and fees are assessed at the regular quarter-hour rate up to the maximum charge for a complete regular quarter.

The refund policy covering withdrawals and dropped courses for the summer quarter is based on the length of the term for the course(s) dropped. No refund is applicable to term courses dropped later than 14 calendar days after the regular registration day for the course(s) involved.

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. Students using the Bursar's Office must have their fee receipts validated and supply necessary details concerning fee payment waiver.

NOTE: All fees are subject to change.

All charges and refunds will be made to the nearest even dollar. All charges are subject to subsequent audit and verification. The University reserves the right to correct any errors in fee or rental payments by appropriate additional charges or refund. Other information on fees, expenses, refunds, and adjustments is given in the Timetable (schedule of classes) for each quarter.

The University is authorized by statute to withhold diplomas, grades, transcripts, and registration privileges until student debts and obligations (other than Student Loan Fund notes) owed to the University are satisfied.

Residency Classification for Tuition Purposes

When a prospective student applies to The Graduate School of UTK for admission, the student is notified of residency classification (in-state or out-of-state) for tuition purposes. Classification is based on information supplied in the Graduate Application for Admission. A student does not acquire in-state residency status while enrolled full-time at a higher educational institution in Tennessee. Proof of in-state residence is the responsibility of the individual.

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

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

Academic Common Market

The Academic Common Market is an interstate agreement among Southern states for sharing unique programs. Participating states are able to make arrangements for their residents who qualify for admission to enroll in specific programs at UTK on an in-state tuition basis, where these programs are not available in the state of residence.

Cooperating states in the Academic Common Market are Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, South Carolina, Tennessee, Texas, Virginia and West Virginia. Sixteen doctoral and fifteen Master's programs at UTK are approved by the Academic Common Market. Students in these states are able to make arrangements for their residents who qualify for admission to enroll in specific programs at UTK on an in-state tuition basis, where these programs are not available in the state of residence.

Residents of one of the member states who would like further information should contact the Residency Clerk at the Graduate Office or the Southern Regional Educational Board, 130 Sixth Street, N.W., Atlanta, GA 30313.

Financial Aid

UTK offers several types of financial assistance for which graduate students can apply.

Assistantships and Fellowships: Graduate assistantships, scholarships, and traineeships are offered through various departments.

Candidates from any field of study are invited to apply. Application packets are available from the Graduate Office after November. Completed applications, including all supporting materials, must be submitted to the Assistant Director of Graduate Admissions by January 15. Offers of awards will be announced by March 15.

Employment: Three sources of student employment are coordinated by the Financial Aid Office. The federally-sponsored Work-Study Program provides students having demonstrated financial need with part-time jobs. Employment: Three sources of student employment are coordinated by the Financial Aid Office. The federally-sponsored Work-Study Program provides students having demonstrated financial need with part-time jobs. Employment: Three sources of student employment are coordinated by the Financial Aid Office. The federally-sponsored Work-Study Program provides students having demonstrated financial need with part-time jobs. Employment: Three sources of student employment are coordinated by the Financial Aid Office. The federally-sponsored Work-Study Program provides students having demonstrated financial need with part-time jobs. Employment: Three sources of student employment are coordinated by the Financial Aid Office. The federally-sponsored Work-Study Program provides students having demonstrated financial need with part-time jobs.
Job Location and Development Office. The Financial Aid Office will endeavor to obtain job opportunities for every interested student. **Loans:** Three types of loans are administered by the Financial Aid Office: (1) National Direct Student Loans; (2) The University of Tennessee Student Loans; (3) Guaranteed Student Loans, financed by certain banks and credit unions. The student should allow for three months’ total processing time when applying for a loan. 

Financial aid programs, policies and procedures are subject to change. Students interested in applying for employment or loans should refer to the current Student Financial Aid Handbook and A Student Consumer's Guide to Federal Financial Aid Programs.

Information and applications can be obtained from the Financial Aid Office.

**Veterans' Benefits:** Veterans, and widows or children of certain deceased or disabled veterans, who have been admitted to a degree program at UT are paid by the Veterans Administration for course loads of 9 or more graduate hours each quarter. Maximum benefits are paid by the Veterans Administration for courses audited. The maximum benefit is $20 per credit hour for courses beyond 9 credit hours. Veterans' Benefits are paid by the Veterans Administration for three months' total processing time when applying for a loan. 

**Veterans** are paid for a maximum of 9 credit hours each quarter. The student should allow for three months’ total processing time when applying for a loan.

**Veterans' Administration** pays the cost of tuition and fees for veterans who meet the requirements for eligibility. The student should allow for three months’ total processing time when applying for a loan.

Course loads of 9 or more graduate hours each quarter are covered by Veterans' Administration. Maximum benefits are paid by the Veterans Administration for courses audited. The maximum benefit is $20 per credit hour for courses beyond 9 credit hours. Veterans' Benefits are paid by the Veterans Administration for three months’ total processing time when applying for a loan.

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**Veterans’ Administration** pays the cost of tuition and fees for veterans who meet the requirements for eligibility. The student should allow for three months’ total processing time when applying for a loan.

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**Veterans** are paid for a maximum of 9 credit hours each quarter. The student should allow for three months’ total processing time when applying for a loan.
unsatisfactory performance and cannot be used to satisfy degree requirements. (no quality points), a temporary grade indicating that the student has performed satisfactorily in the course, but due to unforeseen circumstances, has been unable to finish all requirements. An I is not given to enable a student to do additional work to raise a deficient grade. All incompletes must be removed within two quarters, excluding the summer quarter. If a supplementary grade report has not been received in the Graduate Office at the end of the second quarter, the I will be changed to an F. The course will not be counted in the cumulative grade average until a final grade is assigned. No student may graduate with an I on the record.

S/NC (carries credit hours, but no quality points), S is equivalent to a grade of B or better, and NC means no credit earned. Courses where NC is received may be repeated for a grade of S. S/NC grading is allowed only where indicated in the course description in the Graduate Catalog. The number of S/NC courses in a student’s program is limited to one-fourth of the total credit hours required.

P/NP (carries credit hours, but no quality points), P indicates progress toward completion of a thesis or dissertation. NP indicates no progress. W (carries no credit hours or quality points), indicates that the student withdrew from the course. No graduate student may repeat a course for the purpose of raising a grade already received, with the exception of NC.

Proficiency Examinations

A proficiency examination may be given in academic courses offered for graduate credit. Applications for proficiency examinations are available in the Office of the Registrar, 209 Student Services Building. To be eligible, a student must be admitted to The Graduate School. The request for examination must be approved by the head of the department offering the course. Students applying for this privilege must present evidence to the department head that they have the knowledge and abilities expected of graduate students who have taken the same course. Upon passing such an examination with a minimum grade of B, the students will receive graduate credit. A maximum of one-fourth of the total credit hours in a Master’s degree program may be earned by this method, subject to approval in the student’s graduate committee. A fee of $10 must be paid before each examination. Proficiency examinations may not be used to raise the grade or change the credit in a course previously completed, nor may such an examination be repeated. Proficiency examinations taken at other institutions are not transferrable.

English Proficiency

Any student whose native language is not English must present a TOEFL score of at least 525 unless he/she has received a Bachelor’s or Master’s degree from an accredited institution in the United States. Some departments will require a higher minimum TOEFL score. The student must also pass an English proficiency examination given by the University prior to initial registration. Students whose performance on the examination indicates a need for additional English study must enroll immediately for English 1221—Written and Oral English for Foreign Students (or another course assigned by the English Department) for undergraduate credit and pass with a grade of C or better. A student may not take more than 6 additional hours of course work while enrolled in English 1221. Those students whose scores indicate that they are not prepared to enter English 1221 will be referred to a program of intensive English study prior to taking the course.

Law Courses

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

Different rules apply to students enrolled in the Dual J.D.-MBA program. Grades must be earned according to the grading system of the respective colleges, e.g. numerical grades for law courses, letter grades for graduate courses. The admission committee will accept these courses if they meet grade requirements. Only one cumulative GPA (law or graduate) will be carried on the student’s transcript until graduation, at which time both the graduate and law cumulative will be added to the permanent record.

A student enrolled in the DBA program may use 8 semester hours or more of law courses for the supporting area under the arrangement described on p. 36.

Auditors

Persons who wish to attend certain classes regularly, without taking examinations or receiving grades or credit, may do so by completing a supplementary application, paying the application fee, registering as auditors, and paying regular fees.

Correspondence Study

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

Transfer Credits

Official transcripts must be sent directly to the Graduate Office from all institutions previously attended before any transfer of credit will be considered. In order to be transferred into a graduate program at UTK, a course must:
1. be taken for graduate credit;
2. carry a grade of B or better;
3. be a part of a graduate program in which the student had a B average;
4. not have been used for a previous degree;
5. be approved by the student’s graduate committee and the Vice Chancellor for Graduate Studies and Research on the Admission to Candidacy form.

Courses transferred into any graduate program will not affect the minimum residence requirements for the program, nor will they be counted in determining the student’s grade point average. Credits transferred need not be used to meet the 5000- or 6000-level course work requirements. Credit for extension courses taken from other institutions is not transferable, nor is credit for any course taken after admission to candidacy.

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

Ed. S. degree: A maximum of 9 quarter hours of course work beyond the Master’s degree may be transferred into an Ed. S. program. Credits transferred in the last 45 hours taken for the degree must have been completed within the six-year period prior to the receipt of the degree. They will be placed on the student’s UTK transcript only after admission to candidacy.

Doctoral degree: The number of hours the student may transfer into a doctoral program will be determined by the student’s doctoral committee. Although the courses transferred toward the degree, they will not be placed on the student’s UTK transcript.

Change of Program

A student who wishes to change a major program of study must complete a Request for Change of Graduate Program form which can be obtained from the Graduate Office. The form requires the signature of the head of the department in which admission was previously granted. No signature is needed if a student requests to change from non-degree or provisional status to a degree program, or from one degree to another within the same department. Acceptance into a new degree program is contingent upon review and approval by that department. If the student is not accepted into the new degree program requested, he/she remains in the former department/program. The results of each request for program change are communicated to the student by mail.

Residence Requirements

Residence is defined as full-time registration for a given quarter on the campus where the program is located. The summer quarter is included in this period.
Facilities and Services

Housing

- Single Men and Women: Single graduate students are provided accommodations in facilities conducive to academic achievement and personal responsibility. Single graduate students have the same priority as other single students and may be assigned to any residence hall. Some units of the residence halls and the student apartment building have been designed 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 four. It is the responsibility of each resident to maintain the apartment to University standards. Further information can be obtained from the Office of Residence Halls, 405 Student Services Building.

- Married Students: The University has provided excellent apartment facilities in several locations. Information and assistance in locating off-campus housing are available in the Off-Campus Housing Office, 405 Student Services Building.

Services to the Physically Disabled

Services to students with physical disabilities, whether permanent or temporary, are coordinated by the Office of the Dean of Admissions and Records, 305 Student Services Building. In conjunction with the Physical Plant Office, the UT Bookstore, the Student Activities Office, and academic departments, the office seeks to ensure that all undergraduate students have access to the services necessary to accommodate them. Further information is available from the Handicapped Student Services brochure and directory.

The University Library

The University of Tennessee, Knoxville Library owns approximately 1,400,000 volumes, more than 2,000,000 manuscripts, 56,000 microfilm reels and 1,150,000 items of other microform, plus recordings, tapes, United States and United Nations documents, and more than 20,000 periodicals and other serial titles, which are received annually. The library's membership in the Association of Research Libraries reflects 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.

Library holdings in Knoxville are housed in the James D. Hoskins (Main) Library and its three branches: Agriculture-Veterinary Medicine, Music, and the John C. Hodges Undergraduate Library.

The Special Collections section in the Main Library is a repository of regional and local materials, Tennesseana, and other specialties, including legislative papers andmemorabilia of many Tennessee figures. The Radiation Biology Archives comprises the files of a group of internationally renowned scientists. Special Collections materials are of particular interest to scholars in the fields of history, political science, social sciences, biological sciences, and the arts.

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

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

Computing Center
The University of Tennessee Computing Center (UTCC) provides computing facilities and services for the University's teaching, research, public service, and administrative activities. UTCC maintains close contact with the UT community by supporting research and instructional users with professional computer staff.

UTCC is principally located in the Stokely Management Center and in Andy Holt Tower. From the Stokely location, UTCC supplies computing services to all campuses in the UT System through job entry facilities located on each campus. At UTK, UTCC maintains seven job entry stations for batch work and eight sites for interactive computer work. UTCC maintains a graphics center with two digitizing tablets, a graphics plotter and nine terminals, four storage and five refresh. Another digitizing tablet, plotter, and storage terminal are available at SMC M-1.

UTCC's computers at Stokely Management Center are two IBM 370/3031s and a DEC System-10, which are used in research, instruction and administrative work. UTCC also has an IBM 360/40 used exclusively for administrative work. Each IBM 370/3031 has four million bytes of memory. The DEC System-10 is a 1090 configuration with 512K words of extended memory.

UTCC supports remote job entry stations with the IBM 370/3031-DEC System-10 combination and CalComp plotter. The IBM 370/3031 runs under S/360 and the DEC System-10 runs under TOPS-10. Time sharing features include VM/CMS and Coursewriter III on the 370/3031s, and APL, FORTRAN, BASIC, COBOL, MACRO, and other special purpose application programs on the DEC System-10.

UTCC publishes a User's Guide which describes the use of the IBM 370/3031 and the DEC System-10 User's Guide which describes the use of the DEC System-10. The guides are available at the UT Book and Supply Store. UTCC also publishes a monthly Newsletter which announces systems, equipment and procedural changes and contains other items of interest to users. Program writeups and special user's guides are also available.

UTCC periodically offers intensive training seminars of several days duration in computer utilization on the IBM 370/3031s and the DEC System-10. These seminars are primarily for faculty, staff and graduate students who use or plan to use UTCC facilities. UTCC offers non-credit short courses each quarter in topics such as programming languages and special purpose programs. These courses are announced in the UTCC Newsletter, the "Campus Capsule" section of the UT Daily Beacon, and "this week on campus", a publication announcing campus events.

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

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 during their stay at UT. International Student Affairs serves as the official University representative in all matters involving immigration authorities, educational organizations, and foreign governments.

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

The International House is located near the campus, at 1601 West Clinch Avenue. Provided by UT and operated by the staff of the Office of International Student Affairs, the House is a social and recreational center where domestic and international students meet to relax and discuss matters of mutual interest. The small library at 'I' House contains books and periodicals from all over the world. University facility is open during vacation periods.

International students applying for admission should write to The Graduate School.

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

Graduate Research Centers and Institutes
Energy, Environment, and Resources Center
E. Lumsdaine, Director, Ph. D. New Mexico State
The Energy, Environment, and Resources Center was created to encourage interdisciplinary studies at UT, directed at solutions to problems related to energy and the environment. The Center provides assistance to faculty interested in developing research and public service projects, manages research and development projects that involve several disciplines, and assists Tennessee government and industry in specific problems related to energy and environment. It also participates in the Statewide Consumer Education Program, especially in developing materials for the program.

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

Transportation Center
Director: K. W. Heathington, Ph. D., Northwestern, P.E.
Associate Director: M. S. Bronzini, Ph. D. Pennsylvania State, P. E.
Assistant Directors: D. H. Jones, M.S. Tennessee; P. R. Tutt, M.S. Texas A & M.

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

The Center's contribution to the field and its success in meeting the challenges of contemporary transportation research is predicated on the philosophy that education and research, being equal members of a partnership, go hand-in-hand. In addition to education and research, the Transportation Center has played a leadership role in workshops, seminars, and short courses concerned with such diverse but related topics as benefit-cost analysis in state rail planning, highway rail grade crossing safety, noise assessment, remote sensing, urban public transportation management, ridesharing, transportation brokerage and planning, child passenger safety, traffic engineering, transportation safety, urban transportation modeling, research management, and other areas of transportation interests.

The University of Tennessee Space Institute
C. H. Weaver, Dean, Ph.D. Wisconsin
A. A. Mason, Associate Dean, Ph.D. Tennessee

The Space Institute was originated to interface University faculty research with the Arnold Engineering Development Center of the United States Air Force. Located at
Tullahoma, Tennessee, the Space Institute offers graduate degree programs with majors in Aerospace Engineering, Aviation Systems, Computer Science, Electrical Engineering, Engineering Science, Mathematics, Mechanical Engineering, Metallurgical Engineering, and Physics. In addition to the fundamental academic work characteristic of each discipline, research opportunities and supporting interdisciplinary course work are available to permit 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, plasmodynamics, flow diagnostics including spectroscopic and electrooptic means, and systems management. Work is also in progress in remote sensing and magnetohydrodynamic power generation of water utilization. Course 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 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 UTSI 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.

Water Resources Research Center

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

The Water Resources Research Center is a federally-designated institute for the conduct of water resource research for the state. The purposes of the Center are: (1) to assist and support all the academic institutions of the state, public and private, in pursuing water resources research programs addressed to areas of concern to the state; (2) to provide information, dissemination and technology transfer services to state and local government bodies, academic institutions, professional groups, environmental organizations, industries, and the general public, who have an interest in water resources matters; (3) to promote education in fields relating to water resources and to encourage the entry of promising students into careers in these fields.

Off-campus Graduate Centers

Kingsport University Center: UTK offers at Kingsport resident graduate programs in science and engineering at both the Master's and doctoral levels. The program is operated within the policies set by the Graduate Council of UTK and is coordinated with the graduate and undergraduate offerings of East Tennessee State University.

Students who enroll in this program must be admitted to The Graduate School of UTK. Information and appropriate application forms may be obtained from Marvin K. Goodman, Director, Kingsport University Center, The University of Tennessee, University Boulevard, Kingsport, Tennessee 37660.

Oak Ridge Resident Graduate Program: UTK offers graduate study programs at Oak Ridge, with work leading to Master's degrees in Business Administration with a concentration in management, Industrial Education, and Statistics; the Master's and doctoral degrees are available in engineering, mathematics and physical and biological sciences. Courses are given in the late afternoons, evenings, and Saturdays, with research facilities provided by and used in cooperation with the Oak Ridge Associated Universities and the Union Carbide Corporation, Nuclear Division. This program is supported under a subcontract with Oak Ridge Associated Universities with principal support coming from Union Carbide Nuclear Division. UT is one of the forty-three colleges and universities which sponsor ORAU, a nonprofit education and research management corporation.

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

Nashville Graduate Engineering Program: Opportunities for graduate study leading to the degree of Master of Science in Civil Engineering and Industrial Engineering are offered by UTK.

Students who enroll in these programs must be admitted to The Graduate School of UTK. Information and appropriate forms may be obtained from Jerry Westbrook, Director, Nashville Graduate Engineering Program, Tenth and Charlotte, Nashville, Tennessee 37203.

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

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

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

Information and appropriate forms may be obtained from Jerry McGee, Director, 109 Gooch Hall, UTM, Martin, Tennessee 38238.

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 14.

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

For complete information concerning the program see page 155.

Requirements for Advanced Degrees

Master's Degrees

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

Course Requirements: A candidate for a Master's degree must complete a minimum of 45 hours of graduate credit in courses approved by the student's Master's committee. In thesis programs, a minimum of 9 quarter hours of credit in the major must be earned in course 5000 while the student is preparing the thesis. Hours applied to the Master's degree may be entirely from one major subject or may be distributed to include one or two minor areas. In a 45-hour program the major subject must include at least 18 hours of graduate course work, exclusive of course 5000, and a graduate minor must include no fewer than 9 nor more than 18 hours of graduate credit.

At least one-half of the total hours in a Master's degree program must be taken at UTK in courses numbered at or above the 5000 level. Only 9 thesis hours can be counted toward this requirement.

Master's Committee: A committee composed of the major professor and at least two faculty members at the rank of assistant professor or above should be formed as early as possible in a student's program, and must be formed by the time a student applies for admission to candidacy (refer to Advisor/Major Professor, page 14). The responsibility of this committee is to assist the student in planning a course of study and carrying out research, and to ensure fulfillment of the degree requirements. If the student has a minor, one member of the committee must be from the minor department.

Admission to Candidacy: Application for admission to candidacy for the Master's degree is made as soon as possible after the student has completed any required prerequisite courses and 15 hours of graduate course work with a 3.0 average or higher in all graduate work. The student must submit the Admission to Candidacy form, with appropriate signatures, to the Graduate Office no later than commencement day of the quarter preceding the quarter in which he/she plans to graduate.

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

**Final Examination for Thesis Students:** A candidate presenting a thesis must pass a final oral (or oral and written) examination on all work offered for the degree. The examination will be concerned with course work and the thesis, measures the candidate's ability to integrate material in the major and related fields, including the work presented in the thesis. This examination, which must be scheduled through the Graduate Office, shall be held at least three weeks before the final date for approval and acceptance of theses by The Graduate School. The final draft of the thesis must be distributed to all committee members at least two weeks prior to the date of the final examination. In case of failure, the candidate may not apply for reexamination until the following quarter. The result of the second examination is final.

**Thesis:** The thesis represents the culmination of an original research project completed by the student. It must be prepared according to the UT Thesis and Dissertation Manual. Two copies of the thesis must be approved and accepted by The Graduate School on or before the deadline specified each quarter in the Graduate School News. Each copy must include an approval sheet, signed by the members of the Master's committee, certifying that they have examined the final copy of the thesis and judged it to be satisfactory.

**Non-Thesis Registration:** All non-thesis students using University facilities or faculty time must be registered for course work. Students taking courses for transfer must register for the courses offered for credit. The candidate may not be reexamined 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. A department may require an additional oral examination. The examination is not merely a test over course work, but a measure of the candidate's ability to integrate material in the major and related fields. It must be scheduled through the Graduate Office in accordance with the deadlines specified in the Graduate School News and will be conducted by the department's committee. Students taking the final examination but not otherwise using University facilities may pay a fee of $50 instead of registering. Students finishing incomplete courses, however, must register for a minimum of 3 quarter hours. In case of failure, the candidate may not apply for reexamination until the following quarter. The result of the second examination is final.

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

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**Doctoral Degrees**

Three doctoral degree programs are available: Doctor of Philosophy (Ph.D.), Doctor of Education (Ed.D.), and Doctor of Business Administration (DBA). Programs are listed under "Majors and Degrees Available," page 1-19. For additional information and requirements, consult individual program descriptions listed by college and department in this Catalog. See also the chart, page 22, for the summary of candidate's regulations for dissertation and research in the major and related fields. Additional work taken for S/NC grading may comprise up to one-fourth of the student's total graduate hours.

**Doctoral Committee:** The student and the major professor identify a doctoral committee, composed of at least four faculty members, three of whom, including the chair, must be approved by the Graduate Council to direct doctoral research. At least one member must be from a department other than the student's major field. This committee is nominated by the department head or college dean, and approved by The Graduate School.

The committee should be formed during the student's first year of doctoral study. Subject to Graduate Council policies and individual program requirements, the committee must approve all course work applied toward the degree, certify the student's progress in the major field and any collateral fields, direct the research, and recommend the dissertation for
Continuous Registration: The student must register continuously for course 6000 (minimum of 3 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 summer quarters and the quarter in which the dissertation is approved and accepted by The Graduate School. A minimum total of 36 hours of course 6000 is required before the dissertation will be accepted. A student who will not be using faculty services and/or university facilities for a period of time may request leaves of absence from dissertation research up to a maximum of eight quarters. The request will be considered by The Graduate School upon recommendation of the department head.

Doctoral Examinations: Departments may, at their option, administer diagnostic and/or qualifying examinations in the early stages of the student's doctoral program. Successful completion of a comprehensive examination and a final examination is required for all doctoral degrees.

1. Diagnostic or placement examinations, which can be written and/or oral, may be given to students on admission to the doctoral program to help determine the student's level of preparation, areas of strengths and weaknesses, and general background. Since courses bearing the same title may vary in content from institution to institution, the diagnostic or placement examinations are designed to aid in the selection of courses and to determine the student's preparation to continue doctoral studies at UTK.

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

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

The faculty of the graduate program and/or the student's doctoral committee will determine the content, nature and timing of the comprehensive examination and certify its successful completion. The department or committee may, at its discretion, divide the examination, administering portions of the examination at several times during the student's course of study. A written examination is required and oral examination is encouraged. Students should review carefully the written statement from each doctoral degree program which details the timing, areas covered, grading procedures, and provisions for repeating a failed examination.

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

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

Satisfactory completion (grade of B or better) of a 3030 course in a language department may be substituted for a language examination. This course cannot be repeated to satisfy the language requirement.

Admission to Candidacy: A student may be admitted to candidacy for the doctoral degree after passing the comprehensive examination, fulfilling any language requirements (for Ph.D.), and maintaining at least a B average in all graduate course work. Admission to candidacy must be applied for and approved at least two full quarters prior to the date the degree is to be conferred. Each student is responsible for filing the admission to candidacy, which must be signed by the doctoral committee and the department head, and approved by the Vice Chancellor for Graduate Studies and Research.

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

A student should be registered for the number of dissertation hours representing the fraction of effort devoted to this phase of the candidate's program. Thus, a student working full time on the dissertation should register for 12 hours of 6000 per quarter. Two copies of the dissertation (prepared according to the regulations in the UT Thesis and Dissertation Manual) must be submitted to and accepted by The Graduate School. Each copy must include an approval sheet, signed by all members of the doctoral committee, which certifies to the Vice Chancellor for Graduate Studies and Research that they have examined the final copy and found that its form and content demonstrate scholarly achievement. Doctoral forms and a thesis card are also submitted at this time. The student should check with the department head concerning additional required copies of the dissertation.

Time Limit: Comprehensive examinations must be taken within five years, and all requirements must be completed within eight years, from the time of a student's first enrollment in a doctoral degree program.
Summary of Procedures for Master's and 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 graduate degree candidate</td>
<td>Graduate Office and Major department</td>
<td>Prior to completing 18 hours of graduate courses</td>
</tr>
<tr>
<td>Formation of Master's/Ed.S. committee</td>
<td>Advisor/Major professor</td>
<td>Prior to application for admission to candidacy</td>
</tr>
<tr>
<td>Submission of application for admission to candidacy</td>
<td>Master's/Ed.S. committee</td>
<td>At least one quarter prior to graduation*</td>
</tr>
<tr>
<td>Approval of admission to candidacy</td>
<td>Vice Chancellor for Graduate Studies and Research</td>
<td>Prior to graduation</td>
</tr>
</tbody>
</table>

GRADUATION REQUIREMENTS FOR NON-THESIS OPTION

<table>
<thead>
<tr>
<th>PROCEDURE</th>
<th>UNDER DIRECTION OF</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placement of name on graduation list</td>
<td>Student</td>
<td>Indicate on registration materials</td>
</tr>
<tr>
<td>Application for diploma</td>
<td>Graduate Office</td>
<td>Deadline available at registration*</td>
</tr>
<tr>
<td>Scheduling of final examination</td>
<td>Graduate Office</td>
<td>Not later than one week prior to final examination*</td>
</tr>
<tr>
<td>Final examination(s)</td>
<td>Master's/Ed.S. committee</td>
<td>Not later than three weeks prior to Commencement*</td>
</tr>
<tr>
<td>Removal of incomplete(s)</td>
<td>Instructor of course</td>
<td>Not later than one week prior to Commencement*</td>
</tr>
</tbody>
</table>

GRADUATION REQUIREMENTS FOR THESIS/PROBLEMS OPTION

<table>
<thead>
<tr>
<th>PROCEDURE</th>
<th>UNDER DIRECTION OF</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placement of name on graduation list</td>
<td>Student</td>
<td>Indicate on registration materials</td>
</tr>
<tr>
<td>Application for diploma</td>
<td>Graduate Office</td>
<td>Deadline available at registration*</td>
</tr>
<tr>
<td>Submission of thesis/problems to Master's/Ed.S. committee</td>
<td>Student</td>
<td>At least two weeks prior to final examination</td>
</tr>
<tr>
<td>Scheduling of final examination</td>
<td>Graduate Office</td>
<td>Not later than one week prior to final examination*</td>
</tr>
<tr>
<td>Final examination(s)</td>
<td>Master's/Ed.S. committee</td>
<td>Not later than three weeks prior to thesis deadline*</td>
</tr>
<tr>
<td>Approval and acceptance of final copy of thesis and thesis card</td>
<td>Master's/Ed.S. committee and The Graduate School</td>
<td>After final examination and not later than two weeks prior to Commencement*</td>
</tr>
<tr>
<td>Removal of incomplete(s)</td>
<td>Instructor of course</td>
<td>Not later than one week prior to Commencement*</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>PROCEDURES</th>
<th>UNDER DIRECTION OF</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission as a potential degree candidate</td>
<td>Graduate Office and Major department</td>
<td>Prior to completing 18 hours of graduate courses</td>
</tr>
<tr>
<td>*Appointment of doctoral committee</td>
<td>Assistant Dean for Graduate Studies on recommendation of department head</td>
<td>Preferably during the first year of graduate study but, at the latest, prior to admission to candidacy</td>
</tr>
<tr>
<td>*Comprehensive examination</td>
<td>Major department</td>
<td>Prior to admission to candidacy</td>
</tr>
<tr>
<td><em>Foreign language examination(s)</em>*</td>
<td>Graduate Office</td>
<td>Prior to admission to candidacy</td>
</tr>
<tr>
<td>Submission and approval of application for admission to candidacy (Forms at Graduate Office)</td>
<td>Doctoral committee and Vice Chancellor for Graduate Studies and Research</td>
<td>At least three quarters prior to graduation***</td>
</tr>
</tbody>
</table>

### GRADUATION REQUIREMENTS

| Placement of name on graduation list                                       | Student                                            | Indicate on registration materials             |
| Application for diploma                                                   | Graduate Office                                    | Deadline available at registration***          |
| Submission of dissertation to doctoral committee                          | Student                                            | At least two weeks prior to final examination   |
| Scheduling of final examination                                            | Graduate Office                                    | Not later than one week prior to final examination*** |
| Final examination(s)                                                      | Doctoral committee                                 | Not later than three weeks prior to dissertation deadline*** |
| Approval and acceptance of final copy of dissertation, doctoral forms, and thesis card | Doctoral committee and The Graduate School         | After final examination and not later than two weeks prior to Commencement*** |
| Removal of incomplete(s)                                                  | Instructor of course                               | Not later than one week prior to Commencement*** |

*The order of these items varies with individual programs.
**Not required in some programs.
***Deadlines are printed in the Graduate School News quarterly.
The Institute of Agriculture traces its history to 1869 when the University was designated as Tennessee's Land-Grant Institution under terms of the Federal Land-Grant Act by the U.S. Congress. The University was enabled to establish an Agricultural Experiment Station. The passage of the Hatch Experiment Station Act by the U.S. Congress in 1887 allowed the University to establish a College of Agriculture.

Since its beginning the Station has come to include the work of three main divisions: Agricultural Experiment Station, Agricultural Extension Service, and College of Agriculture.

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

**Agricultural Experiment Station**

D. M. Gossett, Dean
T. J. Whatley, Associate Dean
J. I. Sewell, Assistant Dean

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

The program is designed and administered through sixteen subject matter departments located at Knoxville. A number of the staff have teaching responsibilities in addition to their research. To assist in the research program the Station supports a large number of graduate students. To serve Tennessee's diverse agriculture, branch stations are operated at Jackson, Milan, Grand Junction, Spring Hill, Springfield, Lewisburg, Crossville, Greeneville, Martin and a forestry branch station at Oak Ridge. Professional and technical staff are in residence at these locations.

**Agricultural Extension Service**

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

The Agricultural Extension Service was established in 1914. Its purpose is to extend through various educational means agricultural and home economics information to farm families and others in the state who do not have the opportunity to enroll in resident courses of instruction at colleges.

The educational program is carried on through offices in each of the ninety-five counties of the state. Educational emphasis includes work in four major program areas: agriculture and natural resources, community resource development, home economics, and education of young people through 4-H Clubs. County Extension staff members working directly with local people are supported in the various information fields by a specialist staff, members of which are stationed either in Knoxville, Nashville, or Jackson.

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

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

**College of Agriculture**

O. Glen Hall, Dean

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

**MASTER OF SCIENCE PROGRAMS**

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

Both majors and minors are available in Agricultural Economics, Agricultural Engineering, Agricultural Extension, Agricultural Mechanization, Animal Science,
Entomology and Plant Pathology, Food Technology and Science, Ornamental Horticulture and Landscape Design, and Plant and Soil Science. Majors only are available in Forestry and Wildlife and Fisheries Science, and from the Department of General Agriculture and Rural Sociology. The minor in General Agriculture requires 18 hours of course work. A complete listing of majors is shown on pages 8-9.

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

Each program of course work and thesis research is planned by the major professor and Master's committee in consultation with the student and will depend upon the student's background, interests, and professional objectives. For example, a student majoring in Entomology and Plant Pathology may pursue work with an emphasis either in the area of plant pathology or economic entomology. Normally, graduate programs will include the thesis requirement. There is, however, a non-thesis option in the Department of Agricultural Economics and Rural Sociology and the Department of Forestry, Wildlife and Fisheries. The non-thesis option with a major in Agricultural Economics has the following minimum requirements: 48 hours of course work of which 18 hours 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.

Requirements of the non-thesis option for the Master of Science degree with a major in Forestry are as follows:
1. 50 hours of course work of which 25 hours must be at the 5000 level or above.
2. An advisory committee of not less than 3 faculty members will be selected. At least one member in addition to the major professor will be from the Department of Forestry, Wildlife and Fisheries. The committee will meet and schedule the student's program during the first quarter in residence.
3. Forestry 5911 (3).
4. 12 hours of course work in the Department of Forestry, Wildlife and Fisheries at the 5000 level or above, exclusive of Forestry 5911.
5. Final comprehensive written and oral examination.

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

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

Agricultural Economics and Rural Sociology

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

A. A major area of concentration to be selected from the following:
1. Agricultural policy
2. Agricultural marketing and price analysis
3. Farm management and production economics
4. Natural resource economics
5. Rural development
B. The core areas:
1. Agricultural economics
2. Economic theory
3. Mathematical and quantitative methods in agricultural economics

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 dissertation 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. A minimum of 108 quarter hours credit 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. 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 credit beyond the Bachelor's degree.
4. A minimum of 24 quarter hours credit must be in related fields outside of agricultural engineering.

Animal Science

The Department of Animal 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

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. A 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.

Food Technology and Science

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

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

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

Additional specific course requirements for the degree of Doctor of Philosophy in Food Technology and Science include:
1. A minimum of 108 quarter hours credit beyond the bachelor's degree exclusive of the Master's thesis. Of this number, students will be required to complete 36 quarter hours in 6000 Doctoral Research and Dissertation.
2. At least 36 quarter hours credit in courses at the 5000 and 6000 level, exclusive of Doctoral Research and Dissertation.
3. A minimum of 9 hours of courses for graduate credit outside of the Department of Food Technology and Science.
4. Additional specific requirements for the degree of Doctor of Philosophy in Food Technology and Science are:
   1. A minimum of 108 quarter hours credit beyond the bachelor's degree exclusive of the Master's thesis. Of this number, students will be required to complete 36 quarter hours in 6000 Doctoral Research and Dissertation.

Plant and Soil Science

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

1. Soils
2. Plant breeding and genetics
3. Crop production

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 chairperson of the faculty advisory committee and will direct the research and the preparation of the dissertation.

Departments of Instruction

Agricultural Economics and Rural Sociology

MAJOR

Agricultural Economics

DEGREES

M.S., Ph.D.

Professors:

J. A. Martin (Head), Ph.D., Minnesota; M. B. Badenhop, Ph.D., Purdue; J. R. Brooker, Ph.D., Florida; D. W. Brown, Ph.D., Iowa State; C. L. Cleland, Ph.D., Wisconsin; J. Dubov, Ph.D., California (Berkeley); L. H. Kaiser, Ph.D., Kentucky; T. H. Klindt, Ph.D., Kentucky; F. O. Leuthold, Ph.D., Wisconsin; B. R. McMahan, Ph.D., Purdue; D. B. Sappington, Ph.D.

Associate Professors:

C. M. Cukkad, Ph.D., Michigan State; D. L. Mclemore, Ph.D., Clemson; S. D. Mundie, Ph.D., Tennessee; R. H. Orr, Ph.D., Illinois; B. W. Todd, Ph.D.; J. D. Tennessee; B. J. Trevena, Ph.D., Tennessee; D. O. Walker, Ph.D., Oklahoma State.

Assistant Professors:

W. M. Park, Ph.D., Virginia Polytechnic Institute; G. D. Whitple, Ph.D., Washington State.

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

Agricultural Economics

4120 Farm Management (3) Principles of farm organization and operation. Market organization, structures, and price policies. Prereq: Agriculture 1110 and Economics 2120. F

4220 World Agriculture and Trade (3) Economic bases of world agricultural production and trade; resource location, land tenure systems, international trade and commercial policy. Prereq: Agriculture 1110 and Economics 2120, or consent of instructor. F

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

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

4320 Agricultural Policies (3) Meaning of agricultural policy in democratic society; relationship of farm groups to public policy; problems giving rise to policy; agricultural policy and appraisal of results; policy problems. Prereq: Agriculture 1110 and Economics 2120. Sp

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

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

4930 Advanced Agricultural Marketing (3) Theory of production, organization and costs. Application of cost price to the production organization of the marketing firm and problems of efficiency of plant operation. Market organization, structures, and price policies. Prereq. 3320. W

5000 Thesis (1-15) E

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

5011 Special Problems in Lieu of Thesis (3) E

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 analysis and research. Prereq: 3120 and Statistics 4310 or equivalent. W

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

5210 Seminar: Agricultural Policies (3) Sp

5220 Seminar: Methodology of Research (3) W

5230 Seminar: Adjustments to Industrialization (3) F

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

5410 Agricultural Marketing Analysis (3) Application of tools of economic analysis and measurement to problems at all levels of market system for agricultural commodities. Prereq: 4530 or equivalent. Sp

5420 Advanced Land Economics (3) Problems in land tenure, land use, and conservation in United States and selected foreign countries. Prereq: 4330 or equivalent. F

5440 The Economics of Agricultural Development (3) Role of agriculture in overall economic development; economic nature of traditional agricultural

ture, and analysis of causal forces and structural independence of agricultural development under conditions of economic change. Prereq: 4240 or consent of instructor. W

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

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

6000 Doctoral Research and Dissertation (3-15) E

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

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

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

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

Rural Sociology

3420 Rural Sociology (3) Nature of rural society; social system concepts; rural-urban differences; nature of social relations; population characteristics and movement; rural social systems; urbanization, food supply, and rural living. Decision-making concepts and social implications. Prereq: 3420 or equivalent. Sp

5470 Research Problems in Rural Communities (3) Special topics in rural sociology. Prereq: 3420 or consent of instructor. May be repeated. Maximum 9 hrs. S/NC only. E

5430 Seminar in Rural Sociology (3) Current rural sociological literature and research; relevance of general sociological theory and methodological techniques. Prereq: 4520 or equivalent. F

5450 Advanced Rural Sociology (3) Application of sociological concepts to analyzing changing social and function of rural life; rural social values, attitudes, and norms as they influence family, formal and informal groups, population shifts and changing farm technology. Prereq: 3420 or equivalent. W

5470 Research Problems in Rural Communities (3) Special topics in rural sociology. Prereq: 3420 or consent of instructor. May be repeated. Maximum 9 hrs. S/NC only. E
### Agricultural Engineering

**MAJORS**
- Agricultural Engineering
- Agricultural Mechanization

**DEGREES**
- M.S., Ph.D.

**Professors:**

**Associate Professors:**

**Assistant Professor:**
- D. O. Baxter, M.S. Missouri.

### Agricultural Engineering

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4230</td>
<td>Selected Topics in Agricultural Engineering</td>
<td>(3) Develop new topics as required by current trends and problems in agricultural engineering.</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4610</td>
<td>Design of Water Control and Waste Utilization Systems</td>
<td>(3) Earth dams, irrigation, drainage, land grading, hydraulic transport of wastes, and applications with agricultural land. Prereq: 3610 or consent of instructor.</td>
<td>1 hr and 2 labs.</td>
<td>W</td>
</tr>
<tr>
<td>4620</td>
<td>Design of Structures for Production, Processing and Environmental Control</td>
<td>(3) Functional planning and structural design of agricultural buildings; emphasis on complete design of structure or system, functional, structural and environmental aspects. Prereq: 3620.</td>
<td>1 hr and 2 labs.</td>
<td>Sp</td>
</tr>
<tr>
<td>4630</td>
<td>Design of Processing and Materials Handling Systems</td>
<td>(3) Development of systems and components for integrated agricultural processing considering mass and energy balances, product characteristics, equipment specifications, storage, handling and economic merit. Prereq: 3630.</td>
<td>1 hr and 2 labs.</td>
<td>F</td>
</tr>
<tr>
<td>4640</td>
<td>Design of Agricultural Machinery</td>
<td>(3) Functional requirements of agricultural machinery. Elements of machine component design; synthesis of mechanisms; mechanical and hydraulic drives. Team effort in completing machine design project. Prereq: 3640 or consent of instructor.</td>
<td>1 hr and 2 labs.</td>
<td>Sp</td>
</tr>
<tr>
<td>5000</td>
<td>Thesis (1-15)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5240</td>
<td>Environmental Control in Agricultural Structures</td>
<td>(3) Engineering analysis of factors related to processes of animal and plant life; basis for development and design of facilities and structures for confined housing of animals, controlled environment for plant growth, and storage facilities for plant and animal products. Prereq: 3220, Agricultural Mechanization 3220, Mechanical Engineering 3110 or consent of instructor.</td>
<td>2 hrs and 1 lab.</td>
<td>Sp</td>
</tr>
<tr>
<td>5340</td>
<td>Hydrology of Agricultural and Forest Lands</td>
<td>(3) Analytical approach to problems involving water surplus, deficiency and time distribution as related to agricultural and forest purposes. Prereq: 3610, Introductory Hydrology, 4020, or consent of instructor.</td>
<td>2 hrs and 1 lab.</td>
<td>F</td>
</tr>
<tr>
<td>5440</td>
<td>Instrumentation in Agricultural Systems</td>
<td>(3) Analysis of specific instrumentation needs in agricultural industry and research problems; principles and design in utilization of specialized instrumentation. Prereq: Engineering electronics or consent of instructor.</td>
<td>2 hrs and 1 lab.</td>
<td>A</td>
</tr>
<tr>
<td>5540</td>
<td>Engineering Properties of Agricultural Machines and Products</td>
<td>(3) Fundamental engineering properties of agricultural products and materials related to handling, processing, and utilization. Prereq: Processing and materials handling systems and Engineering Science and Mechanics 3311. 2 hrs and 1 lab Sp.</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>5640</td>
<td>Research Problems in Agricultural Engineering</td>
<td>(3) Theoretical and experimental studies relating to current problems in agricultural engineering. May be repeated. Maximum 9 hrs.</td>
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<td></td>
</tr>
<tr>
<td>5710-20</td>
<td>Similitude in Design and Research</td>
<td>(3, 3) Dimensional analysis in development of models; theory and types of models, prediction equations; interpretation of data: applications to machinery, soil and water structures, architectural buildings, and other agricultural engineering-related problems. Prereq: Engineering Science and Mechanics 3130 and 3311. 2 hrs and 1 lab. F, W, A</td>
<td></td>
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<tr>
<td>6000</td>
<td>Doctoral Research and Dissertation</td>
<td>(3-15)</td>
<td></td>
<td>E</td>
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<tr>
<td>6110</td>
<td>Seminar</td>
<td>(1) Current research and literature related to engineering in agriculture. May be repeated. Maximum 3 hrs.</td>
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<tr>
<td>6310</td>
<td>Engineering Systems Analysis in Agriculture</td>
<td>(3) Systems approach to design of engineering experiments and applications to integral linear programming, computer analysis, and statistical evaluations, and feedback control in agricultural problems. Prereq: Mathematics 4550 or 4710. Coreq: 3570 or equivalent. 2 hrs and 1 lab.</td>
<td>F</td>
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<tr>
<td>6510</td>
<td>Selected Topics in Agricultural Engineering</td>
<td>(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.</td>
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</tbody>
</table>

### Agricultural Mechanization

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4160</td>
<td>Agricultural Waste Utilization and Disposal</td>
<td>(3) Techniques, equipment, and structures for utilizing, treating, and disposing of agricultural wastes by land spreading, lagooning, and processing. 2 hrs and 1 lab.</td>
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<tr>
<td>4170</td>
<td>Small Engines</td>
<td>(3) Concepts and mechanics of small gasoline engines; selection, operation, adjustment, and repair of single cylinder engines. 2 hrs and 1 lab.</td>
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<tr>
<td>4180</td>
<td>Equipment and Techniques for Application of Agricultural Chemicals</td>
<td>(3) Equipment for application of liquid, solid, and gaseous chemicals; system components; operational characteristics; safety considerations; calibration; selection and management; materials handling and disposal methods. 2 hrs and 1 lab.</td>
<td>Sp</td>
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<tr>
<td>4210</td>
<td>Agricultural Machinery and Tractors</td>
<td>(4) Agricultural machinery and power units; adaptation to agricultural practices; field efficiencies, capacities, adjustment and servicing. Prereq: Mathematics 1560. 3 hrs and 1 lab.</td>
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<tr>
<td>5100</td>
<td>Special Problems in Agricultural Extension</td>
<td>(1-6)</td>
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<tr>
<td>5210</td>
<td>Long-range Extension Program Planning</td>
<td>(3) Development of county extension program based on effective interpretation of physical, social, economic characteristics of areas. Prereq: 3110 or consent of instructor.</td>
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<tr>
<td>5220</td>
<td>Seminar</td>
<td>(3) Review of literature and developments in agricultural extension methods. Prereq: 3110 or consent of instructor.</td>
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<tr>
<td>5310</td>
<td>History, Philosophy and Objectives</td>
<td>(3) Historical and philosophical foundation of informal adult education in American agriculture from the agricultural societies (1785 to present). Key figures, issues, legislative movements, farmer organizations and programs. Prereq: 3110 or consent of instructor.</td>
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<tr>
<td>5320</td>
<td>Volunteer Leadership in Agricultural Extension Programs</td>
<td>(3) Theory, principles and procedures in development of volunteer leadership for small groups in rural communities through agricultural extension programs. Emphasis on analysis of place and importance of volunteer leadership function, techniques of effective leadership in small groups and methods of developing volunteer leadership in agricultural extension work. Prereq: 3110 or consent of instructor.</td>
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<tr>
<td>5330</td>
<td>Supervision of Agricultural Extension Programs and Personnel</td>
<td>(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.</td>
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### Animal Science

**MAJOR**

**DEGREES**
- Animal Science
- M.S., Ph.D.

**Professors:**
- D. O. Richardson (Acting Head), Ph.D. Ohio State; K. M. Barnett, Ph.D. Rutgers; M. C. Bell, Ph.D. Ohio State; N. C. T. Hedlund (Emeritus), Pr.D. Ohio State; J. K. Butts, Ph.D. Ohio State; M. L. Hanshaw, Ph.D. Ohio State; H. M. Jamison, Ph.D. Tennessee; H. A. Johnson, Ph.D. Ohio State; E. R. Lidvall, M.S. Tennessee; J. B. McLaren, Ph.D. Auburn; G. M. Merriman (Emeritus), D.D. Michigan State; M. C. Montgomery, Ph.D. Washington State; R. L. Mushree, Ph.D. Wisconsin; R. Schaub, Ph.D. Washington State; H. V. Shirley, Ph.D. Illinois;
4230 Applied Reproduction in Farm Animals (3)
Application of methods and techniques in collecting, evaluating, processing, and preserving semen; insemination; fertility testing; evaluation of pregnancy and parturition. Male and female infertility. Prereq: 3220 1 hr and 2 labs. F, Sp.

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

4430 Experimental Animal Nutrition Laboratory (2)
Laboratory feeding trials to demonstrate basic animal nutrition concepts including preparation and feeding of experimental diets. Prereq: 3330. W.

4410 Applied Animal Breeding (3) Principles studied in 3420. Team taught by specialists in 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 in terms of production response and economic returns. Prereq: Completion of animal science sophomore and junior core courses or consent of instructor. 3 hrs and 1 lab. F, Sp.

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

4830 Pork Production and Management (4)
Integration of principles of selection, nutrition, breeding, 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 in terms of production responses and economic returns. Prereq: Completion of animal science sophomore and junior core courses or consent of instructor. 3 hrs and 1 lab. F, W, Sp.

4850 Light Horse Production and Management (4)
Structure of industry; systems and practices of production responses and economic returns. Prereq: 3220 or 4230. 2 hrs and 1 lab. W, A.

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

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

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

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. F, Sp.

5322 Advanced Experimental Animal Nutrition (3)
Animal experimental techniques for digestion, absorption, nutrient balances and radiotrace carrier techniques. Prereq: 3311 or 2 hrs. F, W.

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

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

5410 Genetics of Animal Populations (3)
Population and individual, gene and zygotic frequencies; statistical descriptions of populations; forces influencing genetic changes; application to animal breeding. Prereq: 3210 or equivalent. 2 hrs and 1 lab. F, A.

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

5710 Methods of Evaluating Experimental Data in Animal Science (3) Interpretation of data from experiments in animal science based upon such statistical procedures as analysis of variance, covariance, linear regression and correlation, and multiple regression. Prereq: Statistics 5211 or equivalent. 2 hrs and 1 lab. W.

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


6000 Doctoral Research and Dissertation (3-15 E) Research program in any area of animal science.

6150 Topics in Milk Constituents (3) Properties of milk constituents and relationship to milk and dairy products.

6160 Topics in Dairy Microbiology (3) Microbiological problems related to various phases of the dairy industry.
6211 Advanced Topics in Animal Physiology (1-6) Recent advances and concepts, research techniques, current problems. May be repeated. Maximum 6 hrs. E

6220 Environmental Physiology of Farm Animals (3) Environmental factors and measurement; physiological mechanisms of response to environmental factors and measurement; taking care to crops, livestock and residences. Prereq: Consent of instructor. 2 hrs and 1 lab. W, A

6230 Animal Growth and Development (3) Physiological and nutritional aspects of growth of farm animals; effects of growth rates on physiological and productive functions. Prereq: 5344, 5510, 5620 or consent of instructor. Sp, A

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

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

6322 Advanced Animal Nutrition (3) Chemical forms, digestion, absorption, intermediary metabolism, deficiencies, excesses and interaction of nutrients. Importance of proteins; vitamins; and minerals. Prereq: 5333 or 5344; and Biochemistry 4120 or Nutrition 5110; or consent of instructor. May be repeated. Maximum 15 hours. F, W

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

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

6811 Advanced Topics in Animal Products (1-6) Recent advances and concepts, research techniques, current problems. May be repeated. Maximum 6 hrs. E

6910 Seminar (1) Animal nutrition, breeding, physiology, and products. May be repeated. Maximum 6 hrs. F, W, Sp

Entomology and Plant Pathology

MAJOR DEGREE

Entomology and Plant Pathology M.S.

Professors:
C. J. Southard (Head), Ph.D. North Carolina State; J. W. Hilty, Ph.D. Ohio State; F. A. Draughon, Ph.D. Georgia; J. R. Mount, Ph.D. Clemson; M. R. McLaughlin, Ph.D. Illinois.

Associate Professors:

Assistant Professor:
M. R. McLaughlin, Ph.D. Illinois.

4010 Biology of Soil Microorganisms (4) Morphology, physiology, and physiology of soil organisms, decomposition of organic matter, chemical transformations, and interactions between soil organisms and higher plants. Prereq: Introductory microbiology or 3133. 3 hrs and 1 lab. Sp.

4020 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. F, A

5000 Thesis (1-15) E

5010 Research Methods and Instrumentation in Plant Pathology (3) Techniques for laboratory, field, and greenhouse research in plant pathology. Prereq: 3130. 2 hrs and 2 labs. F

5110 Plant Disease Diagnosis (3) Diagnosis of plant diseases, disease symptoms, causal agents and control measures. Prereq: 3130.

5120 Insect Diagnostic Clinic (3) Identification of insects and insects affecting field and vegetable crops. Obtaining of insects and damaged specimens; diagnostic characteristics and control measures. Prereq: 3210 or Zoology 3110.

5210 Plant Parasitic Nematodes (4) Morphology, physiology, taxonomy, and ecology of plant parasitic nematodes with emphasis on host-nematode relationships. Prereq: 6 hrs biological science or consent of instructor. (Same as Zoology 5210.) 2 hrs and 2 labs. W, A

5220 Plant Disease Control (3) Basic problems and principles involved in controlling plant diseases. Prereq: 3130. W, A

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

5240 Plant Virology (4) Symptoms, transmission, purification, characterization, and classification of plant viruses; serology; plant pathogenic viroids, mycoplasmas and spiroplasmas. Prereq: 3130 or consent of instructor. 2 hrs and 2 labs. W, A

5250 Medical and Veterinary Entomology (4) Morphology, taxonomy, biology, and control of arthropod parasites and vectors of pathogens of humans and animals. Ecology and behavior of vectors in relation to pathogen transmission and control. Prereq: 3210; general entomology, or consent of instructor. 3 hrs and 1 lab. Sp, A

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

5310 Special Problems in Entomology (1-6) Comprehensive individual study of current problems. May be repeated. Maximum 9 hrs.

5320 Special Problems in Plant Pathology (1-6) Comprehensive individual study of current problems. May be repeated. Maximum 9 hrs.

5330 Special Problems in Nematology (1-6) Comprehensive individual study of current problems. 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. F, W

Food Technology and Science

MAJOR DEGREE

Food Technology and Science M.S., Ph.D.

Professors:
J. L. Miles (Head), Ph.D. Wisconsin; J. L. Collins, Ph.D. Maryland; H. O. Jaynes, Ph.D. Illinois; C. C. Mellon, Ph.D. Kansas State; W. W. Overcast (Emeritus), Ph.D. Kansas State.

Associate Professors:
B. J. DeMott, Ph.D. Michigan State; S. L. Melton, Ph.D. Tennessee; M. J. Riemann, Ph.D. Kansas State.

Assistant Professors:
M. F. Davidson, Ph.D. Washington State; P. A. Draughon, Ph.D. Georgia; J. R. Mount, Ph.D. Ohio State.

3020 Dairy Products I (4) Procurement, processing and distribution of fluid milk. Manufacture of frozen and condensed dairy products. 3 hrs and 1 lab. W

3040 Meat Science (3) Processing methods, carcass characteristics of meat animals, slaughter, cutting, selection, curing, freezing and cookery. 2 hrs and 1 lab. W, Sp

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

4030 Dairy Products II (4) Principles in the manufacture of butter, cheese and special dairy products. Prereq: 3020. 3 hrs and 1 lab. Sp, A

4130 Food Chemistry I (3) Minerals, fats, oils and vitamins in food as affected by processing and storage. Prereq: Nutrition 3320 or equivalent. 2 hrs and 1 lab.

4140 Food Chemistry II (3) Reactions of proteins, carbohydrates and natural food colorants in food materials. Protein structure, food enzymology and Browning reactions. Effects of storage and processing on proteins and carbohydrates with emphasis on nutritional value and function. Prereq: Nutrition 3320 or equivalent. 2 hrs and 1 lab. F

4200 Food Processing I (4) Prevention of deterioration and spoilage of foods. Methods of preservation and packaging. Prereq: 2200 and Agricultural Mechanization 3510. 3 hrs and 1 lab. F

4210 Food Additives (3) Substances used in food manufacturing with emphasis on properties and functions. Prereq: Nutrition 3320 or equivalent. 3 hrs and 1 lab. Sp, A

4300 Food Processing III (3) Water, sanitation and waste control in food industry. Prereq: Agriculture 1150 and Microbiology 2910-19 or equivalent. W

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

4420 Bakery Products (3) Baking ingredients and their interactions during production and storage of bakery products. Prereq: 4130 and Chemistry 2230 or equivalents. 2 hrs and 1 lab. Sp, A

4810 Microbiology in Food Manufacturing (3) Reactions of food microorganisms in fermentative and enzymatic changes occurring during processing and manufacturing of foods. Prereq: Microbiology 2910-19 or equivalent. 1 hr and 2 labs. F

4820 Fermented Foods (3) Role of microorganisms in preparing foods with emphasis on development of certain desirable characteristics, flavor, aroma, texture, and keeping qualities. Prereq: Microbiology 3810. 2 hrs and 1 lab. Sp, A

4840 Meat Products Manufacturing (3) Prepared meat products with emphasis on sausage making and information related to cost controls, inspection, and meat science. Prereq: 3840 or consent of instructor. 1 hr and 2 labs. W

4920 Analysis of Physical Properties of Foods (4) Physical states of food materials, water, viscosity, colloids, gels, foams, crystals, color. Quantitation and changes induced by processing. Prereq: 4200 and Agricultural Mechanization 3510 or consent of instructor. 3 hrs and 1 lab. W

4940 Advanced Meat Science (3) Qualitative and quantitative characteristics of meat and poultry as related to palatability, cookery, preservation, packaging and merchandising. Prereq: 3460. F

5000 Thesis (1-15) E

5100 Seminar (1) Reports and discussions of selected topics from research literature. May be repeated. Maximum 3 hrs. F, W, Sp

5120 Food Color (3) Chemistry of natural food pigments and measurement, notation, and preservation in food. Prereq: Nutrition 3320. 2 hrs and 1 lab. W

5130 Food Enzymology (3) Commercial and native enzymes in manufacture of foods, and spoilage of food. Prereq: Nutrition 3330. Sp, A

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

5150 Fats and Oils (3) Application of scientific principles to commercial technology of fats and oils. Prereq: 4140. 2 hrs and 1 lab. W, A

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

5310 Food Products Development (3) Fundamentals of heat transfer as related to rate of destruction of microorganisms and rate of loss of quality of food materials through calculation of minimum safe thermal processes for hermetically-sealed packages of foods. Prereq: 4200. 2 hrs and 1 lab. F

5320 Food Thermobiology (3) Fundamentals of chemical environment and metabolism of microorganisms as related to quality control. Prereq: 4340. 2 hrs and 1 lab. F

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

5530 Microorganisms Common in Food Products (3) Identification of desirable and undesirable microorganisms in foods and relationships to manufacturing operations. Isolation and characterization of microorganisms from food products and processes. Prereq: 4810 or Microbiology 3810. 3 labs W

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. Sp, A

**Forestry, Wildlife and Fisheries**

**MAJORS**

- Forestry
- Wildlife and Fisheries Science

**DEGREES**

- M.S.
- M.B.

**Professors:**

- W. E. Hammitt, Ph.D. Michigan; R. J. Strange, Ph.D.
- J. L. Byford, Ph.D. Auburn; B. L. Dearden, Ph.D.
- J. R. Hemingway, Ph.D. Auburn; D. L. Hearn, Ph.D.
- D. W. Johnson (Adjunct), Ph.D. Washington; R. L. Little, Ph.D. North Carolina State; D. M. Ostermeier, Ph.D. Syracuse; J. C. Rennie, Ph.D.; D. H. North Carolina State; K. F. Schell, Ph.D.
- Assistant Professors:

  - W. E. Hammitt, Ph.D. Michigan; R. J. Strange, Ph.D.
  - Oregon State.

**Forestry**

- *5320 Forest Environments and Ecology (3)* Fundamentals of science, art, and technology applied to research, development, and marketing of new food products and processes. Prereq: 4210. 2 hrs and 1 lab. F

- *5330 Forest Microbiology (3)* Classification, nomenclature, identification, and silvical 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 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. F

- *5350 Dendrology and Silvics of Gymnosperms (3)* Classification, nomenclature, identification, and silvical characteristics of the major North American gymnosperms and conifers; physiological and morphological characteristics including classification, life history, regeneration requirements, place in succession, and importance. Prereq: 8 hrs basic biology or botany. 2 hrs and 1 lab. W

- *5310 Forest Measurements and Biometry (4)* Measurements of individuals in animal and plant populations; linear regression; sampling of forest populations; growth and potential production. Prereq: Plant and Soil Science 3610 and Computer Science 1410 or equivalent. 3 hrs and 1 lab. W

- *5320 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. W

- *5210 Forest Resource Economics (4)* Allocation of forest resources and systems. Application of economics to forest resource decision making in private and public sector. Prereq: Economics 2120. F

- *5220 Forest Products and Utilization (3)* Harvesting, processing, production and consumption, intermediate and harvest cuts. Prereq: 3120. Sp

- *3250 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, 3040, Plant and Soil Science 230. Sp

- *3730 Conservation (3)* Forest resources of state, nation, and world; forests in soil and water conservation; wildlife management and recreation; conservational programs. W, Su

- *4022 Utilization (3)* Wood-using industries; processing forest products—sawmills, tree-logging-lumber gangs; pulpwood operations, flooring plants, treating plants; plant layout, flow diagrams. Prereq: 3120. Sp

- *4003 Field Methods of Timber Inventory (4)* Field measurements of forest trees; timber cruising; determining appropriate sample design for specific purposes; tree and stand growth; site evaluation; field problems. Prereq: 3110 and Agricultural Mechanization 3140. Sp

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

- *4006 Silvicultural Methods (4)* Methods and application of intermediate and regeneration cuttings; site preparation, planting and seeding, modifications of cutting methods to obtain desired goods and benefits. Prereq: 3320, 4002, 4003. Sp

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

- *4210 Forestry Organization and Administration (3)* Planning, organizing, and leadership concepts; problems and case studies in forest-resource management. Prereq: Consent of instructor. 2 hrs and 1 lab. F

- *4220 Forest-Resource Management (4)* The forest as an ecological resource; principles and use of traditional timber-management concepts; the multiple-use concept; valuation of forest resources for decision making and planning; taxation of forest firm. Prereq: 4210. W

- *4230 Forest-Resource Management Plans (4)* Field problems and case studies in forest-resource management. Prereq: 4190. Forest as a system; management of forest enterprises as a producer of timber, recreational services, watershed services, and wildlife; principles of multiple-use concept; development of a complete plan based on optimizing forest uses. Prereq: 4120. Sp

- *4240 Interpreting Forest Resources (3)* Principles and applications of traditional timber resources; importance of environmental interpretation to management of forest resources; development and administration of interpretable outdoor recreation field trips required. Prereq: 3240 or equivalent; 2 hrs and 1 lab. Sp

- *4330 Forest Policy (3)* History of forestry in United States with emphasis on development of forest resource policies; current policies influencing development and management of forest resources; brief survey of policy implications of forest resource organizations in public and private sectors. Prereq: 4004. W

- *4340 Aerial Photography in Forest-Resource Management (3)* Use of conventional aerial photography in forest management. Methods and materials used. Examination of detail, aerial inventories, preparation of contour maps, use of other remotely sensed imagery. Prereq: Forestry 3110 or equivalent. 1 hr and 2 labs. Sp

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

- *4430 Regional Silviculture of the United States (3)* Factors that influence silviculture management of important tree species in North America, importance of forests and forestry to a region; physiology, geology, soils, climate and weather; sites and site types, ecology, problems of protection, and silvical characteristics of the more important species. Prereq: 4006 or consent of instructor. W

- *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; socioeconomic and political determinants of recreation development and management. Prereq: 6 hrs sociology and/or economics. 2 hrs and 1 lab. Sp

- *4450 Recreational Behavior in Forest Environment (3)* Use of behavioral theories related to outdoor recreation planning, management, and administration. Implication and application of behavioral concepts to forest recreation problems, review of methodologies for assessing recreational behavior. Prereq: 3240 and 6 hrs in behavioral psychology and/or sociology, or consent of instructor.

- *4540 Wood Drying and Preservation (3)* Concepts of wood drying including wood-moisture relations, specific gravity, moisture content, density, and shrinkage. Concepts of wood drying practices. Relation of wood moisture content to attack by wood destroying organisms, methods of drying, and use in commercial treating systems. Prereq: 3120, Mathematics 1851, Physics 1220, or consent of instructor.

- *5000 Thesis (1-15)* E

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

- *5011 Problem Analysis in Forest Resources (3)* Problem identification, analysis and solution in forest resources management. Identify, analyze, and prepare a complete plan based on optimizing forest uses. Prereq: 4120. Sp
5210 Seminar in Wildlife Conservation (3) Current studies, problems and issues in wildlife agencies and organizations and their programs. Prereq: 3230 or consent of instructor. W, A

5310 Seminar (1) Current developments in wildlife and fisheries science. Consent of each graduate student in residence Winter Quarter. May be repeated. Maximum 2 hrs. S/NC only. W

5400 Advanced Topics in Wildlife Science (3) Recent advances and concepts, research techniques, and analysis of current problems. Prereq: 4450 and 4460 or consent of instructor. May be repeated. Maximum 6 hrs. Sp, A

5450 Wildlife Diseases (3) Necropsy of birds and mammals. Recognition of various diseases and methods of preparing pathological materials in the field and laboratory. Investigative procedures concerning wildlife diseases. Prereq: 1 yr zoology, 1 qr microbiology, pathology or parasitology, 4450 or 4460, or consent of instructor. 2 hrs and 1 lab. Sp, A

5460 Predator Ecology (3) Dynamics of terrestrial vertebrate predator populations in human-altered and relatively unaltered environments. Principles of predator biology and management. Prereq: 4450 and 4460 or equivalent and Zoology 4240. W, A

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

5560 Fish Physiology (3) Mechanisms of circulation, respiration, excretion, osmoregulations, and neural/ hormonal control of these systems in fishes. Practical applications of fish physiology in water pollution assessment, fish culture and fish management. Prereq: Consent of instructor. 2 hrs and 1 lab. W

Ornamental Horticulture and Landscape Design

MAJOR DEGREE
Ornamental Horticulture Landscape Design M.S.

Professors:
D. B. Williams (Head), Ph.D. Pennsylvania State; L. M. Callahan, Ph.D. Rutgers.

Associate Professors:

Assistant Professor:
D. T. Kendall, MLA Louisiana State.

* Required of each graduate student in residence Winter Quarter. May be repeated. Maximum 2 hrs. S/NC only. W

Wildlife and Fisheries Science

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

4450 Game Mammals (4) Classification, identification, distribution, natural history, and management of big game mammals in North America. Prereq: 3230 or 1 yr of zoology. 2 hrs and 2 labs. F

4460 Game Birds (4) Biology, classification, identification, distribution, and management of game birds in North America. prerequisite: 3230 or 1 yr of zoology. 3 hrs and 1 lab plus one weekend field trip. W

4510 Fish Populations (4) Principles and methods of fish population estimation; sampling techniques and equipment; population dynamics; age and growth. Prereq: Biology 3130, 8 hrs mathematics, or consent of instructor. 3 hrs and 1 lab or field period. W

4520 Fisheries Management (4) Methods of warm and cold water fisheries management including techniques of biological assessment, public relations, habitat manipulation and stocking. Prereq: Biology 3130 or consent of instructor. 3 hrs and 1 lab or field period. Sp

5000 Thesis (1-15) E

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

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

*Graduate credit for non-majors only.
Plant and Soil Science

MAJOR

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

Professors:
- L. F. Seatz (Head), Ph.D. North Dakota State; W. A. Krueger, Ph.D. Illinois;
- D. A. Leitze, Ph.D. Michigan State; M. L. Campus, Ph.D. Michigan State;
- J. L. Lewis Ph.D. North Carolina State; V. H. Reich, Ph.D. Iowa State.

Associate Professors:
- F. L. Allen, Ph.D. Minnesota; L. S. Jeffery, Ph.D. North Dakota State; W. A. Krueger, Ph.D. Illinois;
- D. A. Leitze, Ph.D. Michigan State; M. L. Campus, Ph.D. Michigan State;
- J. L. Lewis Ph.D. North Carolina State; V. H. Reich, Ph.D. Iowa State.

Assistant Professors:
- M. C. McClure, Ph.D. California State; R. J. Miles, Ph.D. Texas A & M;
- D. R. West, Ph.D. Nebraska; J. D. Wood, Ph.D. Auburn.

DEGREES

4100 Crop Science (4) Properties of soils in relation to plant availability and uptake; Methods of soil fertility evaluation and principles of fertilizer use; manufacture and properties of fertilizers. Prereq: 2100, 3 hrs and 1 lab. W

3110 Soil Fertility and Fertilizers (4) Properties of soils in relation to plant availability and uptake; Methods of soil fertility evaluation and principles of fertilizer use; manufacture and properties of fertilizers. Prereq: 2100, 3 hrs and 1 lab. W

3120 Grain and Oil Crops (3) Distribution, improve ment, morpholgy, culture, harvesting, and utilization of corn, small grains, grain sorghum, soybeans and related crops. Prereq: 2130. 8 hrs biological science. 2 hrs and 1 lab. W

3140 Forage Crops (3) Characteristics, adaptation, improvement, management, and utilization of grasses and legumes for pastures, hay, and silage. Prereq: 2130. 8 hrs biological science. 3 hrs and 1 lab. F

3160 Cotton and Tobacco (4) Characteristics, adaptation, improvement, culture, harvesting, and marketing of cotton and tobacco. Prereq: 2130. 8 hrs biological science. 3 hrs and 1 lab. F

3180 Fruit Crops Management (4) Soils, planting, cultivation, development of fruit crop plants; pest control, harvesting, packing, storage, and pruning. Prereq: Entomology and Plant Pathology 3130 and 3210. 3 hrs and 1 lab. W

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

3250 Soils in Forestry (3) Soil as a medium for tree growth; relation of physical, chemical, and biological properties of soils to tree growth and management of forest. Prereq: 3130. 3 hrs and 1 lab. W

3510 Commercial Production of Cool Season Vegetables (3) Characteristics, economic importance, adaptability, and production for fresh and processed market; emphasis on peppers, radishes, cole, root, bulb crops, perennials, and Irish potatoes. Prereq: 8 hrs biological science. 2 hrs and 1 lab. F

3520 Commercial Production of Warm Season Vegetables (3) Characteristics, economic importance, adaptability, and production for fresh and processed market; emphasis on sweet potatoes, beans, tomatoes, pepper, cucurbits, sweet corn, and okra. Prereq: 8 hrs biological science. Prereq: 8 hrs of biological science. 2 hrs and 1 lab. Sp

3610 Interpretation of Agricultural Research (3) Principles of crop breeding and development of plant breeding concepts and methods, effects of heterosis, inbreeding, hybridization and selection. Improvement of self- and cross-pollinated crops. Prereq: 3170. 3 hrs and 1 lab. W, A

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

5200 Soil Crop Relationships (3-6) May be repeated. Maximum 9 hrs. E

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

5250 Pedology (4) Factors and processes of formation as related to 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. W, A

5310 Design and Interpretation of Experiments (4) Experimental design, analysis of variance, treatment effects, different variables on precision of experiments; problems dealing with the analysis of data. Prereq: 3610 or equivalent. 3 hrs lec., 1 hr rec. and 1 hr disc. W

5340 Soil Physics (3) Chemical and physical relations of soil materials; relation to plant growth and soil management. Prereq: 4110. 2 hrs and 1 lab. W, A

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

5390 Soil Physical Chemistry (3) Structural properties of soil minerals determining physicochemical reactions, ion exchange. Donnan Equilibrium, double layer theory. Prereq: 4110, Chemistry 4110 or concurrent registration. Sp, A

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

5710 Advanced Plant Genetics (3) Principles of plant genetics, principles of gene action and development of genetic concepts in flowering plants. Prereq: Basic genetics or consent of instructor. F, A

5720 Quantitative Genetics (3) 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. W, A

5750 Advanced Plant Breeding (4) 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. W, A

5810 Crop Climatology (4) Meteorological factors that influence crop production; 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. F, A

5820 Advanced Crop Physiology and Ecology (4) Historical development of research in crop physiology and ecology, development of action and adaptation to specific environmental conditions, the role of environmental factors in crop physiology and ecology. Prereq: 3040; or Botany 3210, 4310 or consent of instructor. 3 hrs and 1 lab. W, A

5850 Mechanisms of Herbicide Action (3) Properties of the uptake, translocation, mode of action and basis of selectivity of herbicides. Effects of herbicides on plant morphology, metabolic systems and enzymatic activities. Prereq: Botany 3210 and Biochemistry 4110 or consent of instructor. Sp, A

6000 Doctoral Research and Dissertation (3-15) E

6100 Special Topics in Soil Science (3) May be repeated. Maximum 9 hrs. E

6200 Special Topics in Plant Breeding (3) May be repeated. Maximum 9 hrs. E

6300 Special Topics in Crop Physiology and Ecology (3) May be repeated. Maximum 9 hrs. E

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

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. W, A

6600 Seminar (1) May be repeated. Maximum 3 hrs. E

College of Veterinary Medicine

H. Kitchen, Dean

C. F. Feed, Associate Dean

W. H. Grau, Jr., Associate Dean

The College of Veterinary Medicine, established in 1974, is organized into six academic departments: Animal Science (jointly with the College of Agriculture),...
Environmental Practice, Microbiology (jointly with the College of Liberal Arts), Pathobiology, Rural Practice and Urban Practice. The College administers a professional curriculum leading to the degree of Doctor of Veterinary Medicine (see the General Catalog) and a graduate program involving all departments and leading to the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees. The instructional program of the College also includes internship and residency training programs in various clinical specialties in the departments of Environmental Practice, Urban Practice, Rural Practice and Pathobiology. (For details write the Director of Residencies and Internships, College of Veterinary Medicine.) Because of the interdisciplinary departmental administration of the College of Veterinary Medicine, the faculty have opportunities in the graduate programs of other instructional units, including Animal Science (nutrition and physiology), Microbiology (bacteriology-virology and immunology), Ecology (environmental toxicology), Public Health, and Comparative and Experimental Medicine. (Refer to other sections of this catalog for a full description of these programs.) The majority of the graduate students and graduate faculty of the College of Veterinary Medicine are involved in the Comparative and Experimental Medicine program (see page 94). This program provides a wide spectrum of interdisciplinary training that prepares graduates to assume positions in biomedical environments and in teaching or research capacities involving humans or animals.

Departments of Instruction

Environmental Practice


5010 Special Topics in Environmental Medicine (1-3) Aspects of aberrant metabolism, pharmacokinetic studies, toxicokinetic studies, epidemiology and techniques in molecular biology: atomic absorption, gas chromatography, ultracentrifugation, extractive techniques and radiomicrocassay. Prereq: Consent of Instructor. May be repeated. Maximum 6 hrs.

5611-12 Pharmacology (1,2) Theories of transport across membranes. Introduction to principles of drug action and distribution. Receptor theory, adverse drug reactions; correlated with Animal Science 8240-50. Prereq: Consent of instructor.

6000 Doctoral Research and Dissertation (3-15) E

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

Pathobiology


5000 Thesis (1-15) E

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

6020 Special Problems in Pathobiology (1-3) Projects of varying nature in necropsy, histopathology, clinical pathology, clinical parasitology, clinical immunology, clinical bacteriology and mycology, and clinical virology. May be repeated. Maximum 20 hrs.

6000 Doctoral Research and Dissertation (3-15) E

5010 Special Topics in Pathology (1-3)

6052 Pathogenesis and Diagnosis of Virus Diseases in Domestic Animals (5) Biology of viruses and pathology of virus infection in domestic animals. Prereq: Biochemistry 4110-20, 4119; Microbiology 4430, 4436; consent of instructor.

Urban Practice

Professor: E. D. Gage (Head), D.V.M. Texas A & M.

Associate Professors: D. O. Godle, D.V.M. Kansas; F. M. Hopkins, D.V.M. Georgia.

5000 Thesis (1-15) E

6000 Doctoral Research and Dissertation (3-15) E

Animal Science/Veterinary Medicine

Professors: R. H. Johnson (Head), Ph.D. Ohio; G. R. Bratton, D.V.M., Ph.D. Texas A & M.


Assistant Professors: D. G. Doyle, B.V. Sc., Ph.D. Cornell; S. A. Kincaid, D.V.M., Ph.D. Purdue.

Veterinary Medicine

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

5382 Veterinary Toxicology (3) Pharmacologic basis and pathologic features of diseases of animals caused by common toxic chemicals: clinical manifestations, diagnosis, and treatment. Prereq: Consent of instructor and Director, Comparative and Experimental Medicine Graduate Program.

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

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

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

Microbiology


Associate Professor: D. A. Brain, D.V.M., Ph.D. Michigan.

For specific course listings please see College of Agriculture, Department of Animal Science, and College of Liberal Arts, Department of Microbiology.
College of Business Administration

C. Warren Neei, Dean
John R. Moore, Associate Dean
Francis A. Chamblin, Assistant Dean for Graduate Programs
John A. Bachmann, Assistant Dean for External Affairs, Director, Management Development Programs
David A. Hake, Director, Center for Business and Economic Research

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 seven advanced degrees: the Doctor of Business Administration, the Doctor of Philosophy with majors in Economics and in Management Science, the Master of Arts and the Master of Arts in College Teaching with a major in Economics, the Master of Science with majors in Economics and Statistics, the Master of Accountancy, and the Master of Business Administration. The Department of Management and the Department of Psychology in the College of Liberal Arts jointly offer an intercollegiate program in Industrial and Organizational Psychology leading to the Master of Science and Doctor of Philosophy degrees. (See page 95). Also, the Department of Management Science offers an intercollegiate program leading to the Master of Science degree. (See page 96).

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

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

The MBA Program

The MBA program is designed for students with undergraduate degrees in the social and natural sciences, the humanities, and professional fields such as engineering, business, agriculture, and architecture. A full-time student can complete the program in six academic quarters. Those with degrees in business earned at an institution accredited by the American Assembly of Collegiate Schools of Business (AACSB) should be able to complete the program in five quarters.

The complete MBA program with a concentration in management is offered by the regular graduate faculty of the College for part-time students on the Knoxville campus and at Oak Ridge. The part-time student carries two courses per term in classes scheduled in the evening hours.

The program consists of the MBA core (twelve to nineteen courses depending upon exemptions based on prior studies and/or proficiency examinations) and a concentration/electives block of eight courses.

Each course is 3 quarter hours of graduate credit. Thus, the total program may consist of from 60 to 81 quarter hours.

Prerequisites. Upon matriculation, the student must have received a bachelor's degree from a regionally accredited institution, but there are no specific course prerequisites required to begin the program except college level mathematics through at least one course in calculus. Those electing the management science or statistics concentration must have completed two years of college level calculus. Those admitted to the accounting concentration should plan on up to two additional quarters for undergraduate prerequisite courses that are taken during the first year of the program. Although not required, completion of undergraduate courses in certain areas may qualify the student for exemption from some core courses. (See information under "Exemption from Core Courses" on page 34.)

MBA Core. The following courses are required in each student's program unless an exemption from one or more courses is granted as provided below under the heading "Exemption from Core Courses." All courses are 3 credit hours. The core courses are:

- Accounting 5010, 5020, 5030
- Business Administration 5310
- Business Law 5010
- Economics 5010, 5020, 5030
- Finance 5010, 5020, 5030
- Management 5010, 5020, 5030
- Management Science 5010
- Marketing 5010, 5020
- Mathematics 5052
- Office Administration 5550
- Statistics 5101, 5102

1 Accounting 5020 and 5030 are waived for students who complete the concentration in accounting.
2 See notation under the heading "MBA Concentration" in the Management Science Program section (page 41).
3 See notation under the heading "MBA Concentration" in the Statistics Department section (page 44).
### Prerequisite Relationships of MBA Core Courses

Read across table to identify prerequisites/corequisites for courses listed in left column

- **X** Prerequisite
- **=** Prerequisite or corequisite
- **°** Prerequisite to a prerequisite or corequisite

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*UTK Math 1550, 5051 or equivalent.

### Concentration and Electives

A concentration area(s) may be indicated on the MBA Program Application or this declaration may be deferred until after matriculation. In any event, selection must be made no later than completion of 27 hours of MBA program course work. Selection of an area(s) early in the program is encouraged to facilitate proper course sequencing. Requests for changes in concentration area(s) must be submitted to the Graduate Business Programs office for approval.

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

- Accounting
- Economics
- Finance
- Forest Industries Management
- Governmental Financial Administration Management
- Management Science
- Marketing
- Real Estate and Urban Development
- Statistics
- Transportation and Logistics
- Exemption from Core Courses. A student may be exempted from certain core courses on the basis of having recently completed equivalent undergraduate courses in these subjects with grades of C or higher at a regionally accredited institution. "Recently completed" means, for mathematics, completion of the last course or regular use of math tools within three to four years of matriculation, and for other areas within five to six years of matriculation. Courses in this category (and the approximate undergraduate equivalent work) are:
  - Accounting 5010 (6 quarter hours, fundamentals of financial accounting)
  - Business Law 5010 (6 quarter hours, the legal and social environment of business)
  - Economics 5010 (9 quarter hours, principles of economics—macro and micro)
  - Mathematics 5052 (12 quarter hours, including college algebra and calculus, See topics included in Mathematics 5051 and 5052)
  - Office Administration 5050 (3 quarter hours, introductory course in computer science with programming).

In addition to the above, a graduate of an AACSB accredited undergraduate business program may request exemption from one or both of the core courses in the area of his/her undergraduate major field, provided at least 30 quarter hours (20 semester hours) of course work were completed in the major area no more than five years prior to matriculation.
and a grade average of 3.0 or higher (on a 4.0 scale) was earned for all courses in the major. Students requesting such an exemption must petition the appropriate department head. The department may require the student to pass a proficiency examination over any course for which exemption is requested. (See page 15).

A minimum of 60 quarter hours of graduate credits is required to earn the degree. If a student qualifies for exemption from a course in addition to those provided for in the two categories described above, whether by proficiency examination or otherwise, an additional elective course approved by the student’s advisor will be included in the student’s curriculum for each such exempted course so as to meet the 60-hour minimum requirement.

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

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

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

The maximum number of hours that may be transferred is 12 quarter hours.

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

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

**Application and Admission.** Applications are accepted to begin the full-time program in the summer, fall, and winter quarters.

There are no admissions for spring quarter. All applicants may be considered for fall quarter entry (mid-August to mid-September) or a summer quarter entry (mid-June) is for students whose programs will include all core courses. Only undergraduate business majors and those who are exempted from Accounting 5010, Business Law 5010, Economics 5010, and Mathematics 5051 (or equivalent) may begin the program in the winter quarter (early January).

Part-time (evening) program students whose programs include Accounting 5010 and Economics 5010 must begin in the fall quarter. Others may begin either fall or winter, or in the summer if the schedule includes one or two courses for which they are eligible.

There are four rounds of admission decision actions during the year as indicated in the table below. These dates are coordinated with the scheduled receipt of the latest Graduate Management Admission Test (GMAT) score reports. To be considered at one of the four admission sessions, the applicant’s file must be complete. A completed file includes the Graduate School application, transcripts of prior college work, the MBA program application, two applicant evaluations and the GMAT score report. The first two items should reach The Graduate School 10 days before the MBA application deadline to allow for internal processing. Other items should reach the Graduate Business Programs office by the deadline date.

For admission to the program, consideration is given to the applicant’s academic record with particular attention to the last two years of undergraduate work and previous graduate studies, to scores on the GMAT and the Test of English as a Foreign Language (TOEFL) for those whose native language is not English, to work experience and other activities which demonstrate potential for leadership, and recommendations from professors or work supervisors. The admission decision is based on all factors which make up the total application; therefore, there is no automatic cut-off for either graduate point averages or GMAT scores.

**Dual J.D.-MBA Program**

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

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

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

The College of Law will award up to 8 semester hours of credit toward the J.D. degree for acceptable performance in a minimum of 12 quarter hours of approved graduate level courses offered by the College of Business Administration. Three of the 12 quarter hours must be earned in Accounting 5030 or a more advanced accounting course. If College of Law credit is given for such an accounting course, the student may not receive credit for a law course 6599—Legal Accounting.

The College of Business Administration will award up to 12 quarter hours of credit toward the MBA degree for acceptable performance in a maximum of 8 semester hours of approved courses offered in 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 dual 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 average 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.

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<th>Latest GMAT Administration</th>
<th>Application Deadline</th>
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To obtain application materials, write or call:

Graduate Business Programs
College of Business Administration
The University of Tennessee
Knoxville, TN 37916
Telephone: (615) 874-5033

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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 socioeconomic systems and environmental forces. Second, the student’s program is flexible enough to respond to individual needs and interests yet is formulated within a sound framework 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 advanced work in the basic disciplines of economic theory, behavioral science and quantitative science to provide the necessary foundations for research.

Foundation Requirements. Although the program is designed for students who have completed an accredited MBA (or equivalent) degree program, those with outstanding undergraduate records in any area may be admitted directly to the DBA program and may take the MBA degree in a coordinated program of study. Program prerequisites include at least one year of college mathematics to include a course in calculus, a course in statistics, knowledge of computer operation, and intermediate economic theory (micro and macro). See page 38 for MBA degree requirements. Entering students deficient in any of these areas may enroll in courses designed to meet these requirements.

Course Requirements for the DBA Program. Each student must demonstrate, by passing appropriate graduate level courses and/or by examination, an understanding of the business functional areas, the basic disciplines underlying the study of business administration, the student’s concentration area and a supporting area. Following are the requirements for each area:

A. Business Functional Areas. One graduate level course in each of the following areas must be completed: managerial accounting, financial management, marketing management, organizational theory and behavior, and business policy. Students who have earned an MBA degree at an accredited institution probably will have met these requirements. Others may include appropriate courses in their programs as approved by their academic committees.

B. Basic Disciplines. Each student must demonstrate proficiency in the following areas by completing course work indicated or by passing appropriate examinations:

- Economics: 12 quarter hours in one or a combination of two of the following areas: statistics, management science, econometrics, or computer science.
- Behavioral Science: Approval of student’s committee is required.
- 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 24 quarter hours of course work is required, including 9 hours of doctoral seminars taken at this University. A study of research methodology of the discipline is included. Graduate work in the field taken at other institutions is considered by the student’s committee in determining additional course work required. Available concentration areas are:
  - Accounting
  - Finance
  - Management
  - Marketing
  - Transportation and Logistics

C. Supporting Area. A minimum of 12 quarter hours of graduate course work is required in an area outside, but complementary to, the concentration area. The student may choose the supporting area from one of the following: one of the business functional areas, one of the basic disciplines or a related area in another school or college of the University. The program of study should be arranged with an advisor in the discipline chosen and must be approved by the student’s committee.

Comprehensive Examinations. Comprehensive written examinations over the concentration and supporting areas are required of each person seeking candidacy for the DBA degree: The dissertation area examination is administered in two sessions of approximately four hours each and the supporting area examination in one session of approximately two hours. The examining committee may, if it deems advisable, supplement the written examinations with oral examinations and may accept the results of only an oral examination for a supporting area in the College of Law. Scheduling of comprehensive examinations will be determined by the examining committee in each of the five concentration areas in coordination with the Assistant Dean for Graduate Programs. The committee must designate two periods during the calendar year and announce the dates at least 90 days in advance. A student may sit for examinations in both areas at one examining period or take them in two consecutive periods. A student who fails an examination on the first attempt must repeat the examination over that area at the next examining period, the results of which shall be final.

Admission to Candidacy. A student may apply for admission to candidacy for the DBA degree after maintenance of at least a B average in coursework, successful completion of comprehensive examinations and acceptance of a research proposal for the dissertation by his/her faculty committee. Admission to candidacy must be approved at least three quarters prior to the date the degree is conferred. Admission in the fall quarter permits graduation in the following spring quarter. See sections headed “Doctoral Committee” and “Admission to Candidacy,” page 49.

For information concerning program admission requirements, academic performance standards, fellowships and assistantships, and general rules and regulations of The Graduate School, see other parts of the College of Business Administration section and the first section of the catalog, “The Graduate School.” Also see “Academic Common Market,” page 105.

Minimum Academic Performance Standards

A graduate student in the College of Business Administration whose 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/her cumulative grade point average 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 M.Acc., MBA, and DBA applicants are required to take the Graduate Management Admission Test (GMAT). Applicants for
programs in economics, management science, and statistics may submit results of either the GMAT or the Graduate Record Examination (GRE) as part of their application. Applicants for management science and statistics programs must have completed at least two years of college level calculus and be proficient in a computer language.

Applicants whose native language is other than English must submit results of the Test of English as a Foreign Language (TOEFL). Scheduled dates and locations for taking these examinations may be obtained from the Educational Testing Service, P. O. Box 966, Princeton, New Jersey 08540, and from most colleges and universities.

In addition to procedures required for admission to the Graduate School (pages 37-40), M.Acc., MBA and DBA applicants must submit additional information on forms provided by the College of Business Administration. The application for all programs and supporting materials should be submitted at least three months prior to desired entry date.

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

**Fellowships and Assistantships**

**Fellowships.** Information concerning nonservice fellowships administered by The Graduate School as well as application blanks may be obtained from the Graduate Office. Information on College-administered fellowships is available from the Graduate Programs Office of the College of Business Administration.

**Assistantships.** A limited number of teaching assistantships and assistantships that range from 10 to 20 hours of service per week are available through the departments of the College. Remuneration includes payment of fees and out-of-state tuition as well as monthly stipend. Awards are generally made on the basis of academic excellence and performance on the admission test. Application forms may be obtained in any of the departments or from the Assistant Dean for Graduate Programs. Applications must be received by March 1 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 socioeconomic information and supports the faculty of the College in seeking funding for research projects. Staff members conduct research in regional economics, public finance, and areas related to socioeconomic problems in the region. The Center publishes the results of its own research and that of others in monograph form so that significant developments in the various business disciplines and economics can achieve widespread exposure. In addition, the Center staff conducts contract research on business and economic problems for governmental organizations and private industry. The Center publishes periodically the Tennessee Statistical Abstract and quarterly the Survey of Business. The Center is a member of the Association for University Business and Economic Research.

**Management Development Programs**

The Management Development Programs offers a wide variety of programs ranging from two-to three-day public seminars and customized "in-plant" programs to the four-week Tennessee Executive Development Program.

The Tennessee Executive Development Program (TEDP) is designed to provide continuing executive education opportunities for executives from firms and organizations located in Tennessee, the South, and the nation. Major objectives of the program are 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 provide 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 thirty-six 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 with contemporaries in other business areas and with TEDP faculty as well.

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

**Departments of Instruction**

**Accounting and Business Law**

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

**Accounting**

**MAJOR**

**DEGREE**

**Accounting**

Professors:


C.P.A.; J. R. Williams, Ph.D. Arkansas, C.P.A.

Associate Professors:


Assistant Professors:


Distinguished Lecturer:

S. B. Wolfe, B.S. Virginia Polytechnic Institute.

**THE MASTER OF ACCOUNTANCY PROGRAM**

The objective of the Master of Accountancy (M.Acc.) program is to provide persons having an undergraduate accounting background and a high level of ability to provide business, government, or professional accounting assignments.

Foundation Requirements. Although the program is designed for students who have completed an accredited baccalaureate degree program with a major in Accounting, those with outstanding undergraduate records in any area may earn the M.Acc. degree by completing prerequisites in accounting and by including courses in other business and related disciplines to supplement the applicant's undergraduate background.

**Course Requirements for the M.Acc. Program.** A student's program encompasses a minimum of 45 quarter hours of graduate course work. Specifically, the student must complete core courses in the disciplines and in the area of accounting as indicated below. Each course is 3 quarter hours of graduate credit.

**Business Core (31 quarter hours):**

Economics 5030, Finance 5420, Mathematics 5052* and 4 additional courses from the following areas, subject to approval of the program advisor (no more than one course may be taken in any one area): Business Policy, Business Law, Computer Science, Economics, Management, Management Science, Marketing, Finance, Statistics, and Transportation.

**Accounting Core (15 quarter hours):** Accounting 5110, 5120, 5210, 5420, 5450. Accounting Electives (select 4-12 quarter hours): Accounting 5130, 5140, 5160, 5220, 5430, 5440, 5510, 5640, 5990.

*Prior course work will be considered in determining the Business Core courses.

*An exemption may be granted for Mathematics 5052 if student has recently completed undergraduate course work of equivalent content with grades of C or higher at a regionally accredited institution. Recently completed means completion of the last course or regular use of math skills within three to four years of last registration.

*Selected courses from other disciplines may be substituted for accounting electives upon approval of the M.Acc. program advisor.
Other Requirements. To qualify for the degree, the student must achieve a B average (3.0) in the business core courses and also a B average in the accounting courses. Each student must pass a final written examination during the last quarter of study for the degree. MBA Concentration: Accounting

DBA Concentration: Accounting

Minimum Course Requirements for MBA Concentration:
Accounting: 5110, 5120, 5210, 5420, and two of the following: 5320, 5330, 5340.

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

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

5200 Corporate Reporting Problems (3) Analysis of uses and limitations of accounting model of firm. Emphasis on internal uses of general purpose financial reports. Prereq: 5010 or equivalent. F, W

5303 Managerial Accounting (3) Analysis of accounting model for providing planning and controlling activities. Attention to development of cost data appropriate to managerial decision models. Prereq: 5020. Economics 5075, Statistics 5020, W, Sp

5110 Seminar in Accounting Theory (3) Evolution of accounting theory, concepts underlying financial reporting models, and authoritative accounting literature. Relating this material to measures relevant to aspects of performance and financial position. Prereq: Consent of department head. May not be taken by students with credit for 4099.

5120 Seminar in Advanced Auditing (3) Theory and concepts underlying the philosophy of auditing as related to current auditing issues. Prereq: 4120 or equivalent.

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


5160 Graduate Internship in Accounting (3) Full-time resident professional employment for one academic quarter for practical experience and credit. Prereq: Consent of instructor. F, W

5190 Seminar in Advanced Managerial Cost Accounting (3) Analysis of conceptual and current issues impacting on development and practice of managerial cost accounting. Cost allocation, planning and controlling, cost applications of uncertainty, and responsibility accounting concepts. Prereq. 3230 or consent of instructor.

5220 Budgetary Planning and Control Systems (3) Application of accounting model to organizing of planning and control systems to meet organization's needs and objectives. Control systems and corporate structures. Analytical decision and cost agreement of resources and control in not-for-profit organizations. Prereq: 3220 or 5030.

5310 Auditing Concepts (3) Concepts and theory of auditing covering environment of internal and external auditing, nature of evidence, internal control evaluation, and reporting. Not intended for persons who have credit for auditing course. Prereq: 3130. Prereq or coreq: Statistics 4415, 5630, or equivalent. May be taken concurrently.

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

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

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

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

5430 Tax Planning (3) Advanced study of income tax problems emphasizing alternatives available to minimize tax liability compatible with achieving taxpayer objectives. Prereq: 5420.

5440 Taxation of Estates and Gifts (3) Transfers at death, inter vivos transfers, life insurance, annuities and employee death benefits, marital and other depletions and corrections, and estate and gift tax returns. Prereq: 4430 or 5330 and 5420. (Not available to students with credit for 4440.)

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

5630 Accounting Systems and EDP Concepts and Control (3) Elements and operation of computer systems in business environment. Analysis, design, implementation, documentation, and control of accounting systems. Prereq: 2130 and knowledge of a computer programming language.

5640 Seminar in Accounting Information Systems (3) Literature on accounting information systems and advanced systems analysis and design concepts. Informational needs of other functional areas of business and interfacing of these areas. Prereq: 4630 or equivalent.

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

5980 Seminar in Accounting Research (3) Integration of areas of financial, managerial, tax, and auditing, including directed problem-oriented research in selected topics. Prereq: 5120, 5210, 5420. (Not available to MBA students.)

5990 Individual Research in Accounting (3) Directed research in a topic of mutual interest to student and faculty member. Prereq: Consent of department head in quarter prior to anticipated enrollment. May be repeated. Maximum 6 hrs.

6000 Doctoral Research and Dissertation (3-15) E

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

Business Law

Professors:
B. D. Fisher, J. L. M. George Washington;
M. L. Townsend Jr., University of Tennessee

5610 Legal and Social Environment of Business (3) Survey of legal and quasi-legal institutions with emphasis on those which have particular significance to business, basic legal notions and principles that pertain to business management. Not available to students with credit for 4110-20 or equivalent. F, W, Su

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

Business Administration

MAJOR

DEGREES

Management and Decision Sciences

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; sizing up company's situation, determining objectives, developing sound policies, organizing and administering personnel to reach company objectives, continuous administrative reappraisals. Enrollment priority given MBA students in last quarter of their program. Prereq: All MBA core courses. F, W, Su

5410 Business and Its Societal Environment (3) Analysis of current forces and changes in society and interrelation 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 problems of small businesses in community. Students work in teams under supervision of participating professor. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

Business Education

See College of Education

Economics

MAJOR

DEGREES

Economics

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

Professors:
D. P. Quade (Head), Ph.D. California (Berkeley);
R. T. Lowery, Ph.D. Texas; S. L. Carroll, Ph.D. Harvard;
W. E. Cole, Ph.D. Texas; G. R. Feiwel, Ph.D. McGill;
C. B. Garrison, Ph.D. Kentucky;
J. F. Holly (Emeritus), Ph.D. Clark; H. E. Jensen, Ph.D. Texas;
F. Y. Lee, Ph.D. Michigan State;
A. Mayhew, Ph.D. Texas; J. R. Moore, Ph.D. Cornell;
W. C. Neale, Ph.D. London School of Economics;
G. A. Spiva, Ph.D. Texas.

Associate Professors:
H. S. Chang, Ph.D. Vanderbilt; E. Glusstoff, Ph.D. Stanford;
H. W. Herpp, Ph.D. Maryland;
D. L. Kaserman, Ph.D. Kansas; K. E. Phillips, Ph.D. Washington (Seattle);
A. M. Schlotman, Ph.D. Washington (St. Louis).

Assistant Professors:
D. L. Clark, Ph.D. Michigan State; C. D. Bonn, Ph.D. Massachusetts Institute of Technology; R. A. Holter, B.A. Old Dominion; J. W. Mayo, M.A. Washington (St. Louis); N. C. Modeste, Ph.D. Florida;
K. L. Murphy, Ph.D. Michigan State; H. Thompson, Ph.D. Houston; E. D. Wichman (part-time), Ph.D. Rochester.

THE MASTER'S PROGRAM

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

The requirements for a graduate minor in Economics are as follows: Either (1) 5111-12 and 5121-22, or (2) 5111 and 5121-22, or (3) with

1 Alumni Distinguished Service Professor
the consent of the head of the economics department, an alternative sequence of 9 hours to meet unusual conditions.

MASTER OF ARTS IN COLLEGE TEACHING DEGREE

The requirements for the MACT degree are listed on page 39. A thesis is required.

THE DOCTORAL PROGRAM Subject Area Requirements

1. Students will be required to complete requirements in core subject fields as indicated:
   a. Economic theory: by comprehensive examination or by completion of Economics 5111-12 and 5121-22 with a B average or higher, and successful completion of Economics 6111 and 6121.
   b. Economic history: 6 hours of economic history at the 5000 level or above.
   c. History of economics: Economics 5150 and 3 hours at the 6000 level.
   d. Mathematical and quantitative methods: Economics 5180, 5190, and 5510. The 5510 requirement may be completed by students participating in Economics 6170, 6180 and 6190.
   Students must achieve a grade average of B+ or higher for all courses offered to fulfill requirements of subparagraphs b, c, and d, and an alternative, may petition to satisfy any one or all of these three fields by some other means such as comprehensive examination.
   2. Students will be required to demonstrate their competence by comprehensive examination in one field with the approval of the department, at least two of which must be selected from the following: economic development; economics of centrally planned economies; economics of labor and human resources; industrial organization; international economics; regional and urban economics; a field, as agreed to by the department, combining two or three of the above.

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

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

MBA Concentration: Economics.

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

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

5000 Thesis (1-15) E

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

5011-12 Problems in Lieu of Thesis (3, 3)

5090 Workshop in Economics (3-9) Special topics in economic education. Not available for credit in any College of Business Administration degree program. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

5910-20-30 Economics Seminar (1, 1, 1) Research in progress and discussion of selected topics. May be repeated. S/NC only. E

6000 Doctoral Research and Dissertation (3-15) E

ECONOMIC THEORY

4110 Managerial Economics (3) Application of economic theory to business decision making; emphasis on profit objectives, measurement and forecasting demand and costs, and capital budgeting. Prereq: 2110-20-30.

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

4150 History of Economic Thought (3) Development of economic thought, tools of analysis, and economics as a social science, together with an analysis of the general conditions which influenced this development. Period covered: 1776 through 1936. Prereq: 1 yr of principles of economics and credit for 5121.

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

5010 Introduction to Economic Analysis (3) Analytical tools of macro- and microeconomics for students without prior training in economics. Price determination, national income measurement and determination, and banking system. Not available to students with credit for 2110-20-30 or equivalent. F, Su

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

5030 Economic Fluctuations, Forecasting, and Stabilization (3) Macroeconomic environment of the firm. Determination of level of output, employment and prices for economy as a whole. Implications of aggregate fluctuations for individual firm. Role of forecasting techniques and stabilization policies. Prereq: 5010 or equivalent. F, Sp, Su

5110 Fundamentals of Microeconomics (3) Verbal arguments and geometric and algebraic techniques. Theory of consumer behavior and demand; theory of production and cost; long and short run theories of profit maximizing firm in both perfectly competitive and monopolistic environments; theory of derived demand. For students whose major is other than economics. Not available for students with credit for 5111. Prereq: 5110 or equivalent. F, W

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

5120 Fundamentals of Macroeconomics (3) Determination of levels of employment and prices for economy as a whole; relationships between interest rates, price expectations, productivity, and quantity of money. Aggregate saving, investment and liquidity preference. For students whose major is other than economics. Not available for students with credit for 5121. Prereq: 3120 or equivalent. W
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. W

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

ECONOMICS OF LABOR AND HUMAN RESOURCES

4420 Economics of Human Resources (3) Analysis of current problems in human resource development and examination of policies aimed at their solution. Problems include unemployment, education and training, poverty and income redistribution, discrimination based on sex or ethnicity, or others. Prereq: 3410.


4470 Collective Bargaining (3) Legal framework of bargaining, public interest and private interest, terms of contracts, grievance procedure, and application of problems and techniques. Prereq: Consent of instructor. F

5410 Seminar in Economics of Human Resources (3) Selected topics in literature of human resource development: problems, analysis, and possible solutions. Prereq: Consent of instructor. F

5420 Seminar in Wage and Employment Theory (3) Current and recent research and employment determination. Prereq: Consent of instructor. W

6411-12, 6421-22 Seminar in Labor Economics (3, 3, 3) Selected problems chosen for their current importance and application of problems and techniques. W, Sp; A

Finance

Professors:

Associate Professors:
J. Wachowiak, J., Ph.D. Illinois (Champaign-Urbana); W. G. Goosby, Ph.D. Wisconsin (Milwaukee); J. M. Newborn, Ph.D. Iowa; J. M. Newborn, Ph.D. Wisconsin; J. C. Golden, Ph.D. George Washington; W. C. Oregon; W. C. Goosby, Ph.D. Wisconsin (Milwaukee); J. M. Newborn, Ph.D. Illinois (Champaign-Urbana).

Assistant Professors:
J. P. Bohm, Ph.D. Washington (St. Louis); D. Choi, Ph.D. Pennsylvania; W. C. Goosby, Ph.D. Wisconsin (Milwaukee); J. M. Newborn, Ph.D. Illinois (Champaign-Urbana).

MBA Concentrations: Finance; Governmental Financial Administration; Real Estate and Urban Development.

DBA Concentration: Finance Minimum Course Requirements for MBA Concentrations: Finance—For the Financial Management area: 5120, 5130, 5410; for the Investments area: 5420, 5430, 5440; for the Banking and Financial Institutions area: 5810, 5820, 5830.

INDUSTRIAL ORGANIZATION

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


Governmental Financial Administration—5710, 5720, 5730, 5740. Real Estate and Urban Development—Real Estate 5110, 5120, 5130, 5140.

5002 Non-Thesis Graduate Completion (3-15) Required for the non-thesis student not otherwise registering during any quarter in which a student uses university facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated only once.

5910-20-30 Finance Seminar (1, 1, 1) Research and discussion of selected current topics in finance. Prereq: Consent of doctoral advisor. May be repeated. Maximum 3 hrs per course. S/NC only. F, W, Sp

6500 Doctoral Research and Dissertation (3-15) E

FINANCE AND INVESTMENTS

5010 Financial Management and Asset Valuation (3) Analysis of decision making in financial management. Process by which a firm is valued; roles of investors, financial markets, instruments, risk and expected returns. Capital budgeting process with respect to identifying relevant variables, understanding alternative capital budgeting tools, decision rules and decision-making criteria. Capital budgeting decision examined under conditions of uncertainty. Advanced tools for risk management. Prereqs: The Economics 5010, 5020. Prereq or coreq: Accounting 5010. W, Sp


5120 Quantitative Techniques in Finance Management (3) Applications of mathematics, probability, and statistics to model building and testing in finance. Prereq: 5002; Statistics 5010. F, W

5130 Financial Administration (3) Cases and readings within firm; refined techniques of analysis; optimal financial decisions; capital cost measurement; utilization of capital markets; general corporate financial theory. Prereq: 5002. W, Sp

5140 Seminar: Managerial Finance (3) Applications of theory and quantitative techniques to solution of investment problems in managerial finance. Prereq: 5012 or 5130. F, W

5420-30 Investments (3, 3) Investment decision process, factors influencing portfolio policies and security prices; financial statement analysis; stock price valuation models. Must be taken in sequence. F, W, W

5440 Commodity Futures and Stock Options (3) Trading in commodity futures markets and in "put and call" stock options; factors influencing commodity and options prices; option valuation models. Prereq: 5420.

5800 Executive-In-Residence Seminar for MBA (3) Practical aspects of financial management and investments. Leading industry, banking, and governmental personnel conduct class. Prereq: Consent of department. Sp


6410-20 Seminar in Theory of Finance (3, 3) Theory of financial decision making under conditions of certainty and uncertainty. Application of economic theory of choice to allocation of resources over time and under uncertainty with reference to investment and portfolio decision-making.

6510 Seminar in Financial Management (3) Employment of quantitative techniques in formulation and solution of financial management problems. W
Management

Professors:
H. D. Dewhirst (Head), Ph.D., Texas; R. W. Boling, Ph.D., Stanford; M. Gordon, Ph.D., California; H. W. Henry, Ph.D., Michigan; A. H. Kealy (Emeritus), MBA Pennsylvania; J. M. Laren, Ph.D., Purdue; S. K. Reed, Ph.D., Edinburgh; S. C. Vance, (Emeritus), Ph.D., Pennsylvania; G. H. Whitlock; Ph.D. Tennnessee; M. B. Wortman, Jr., Ph.D., Minnesota.

Associate Professors:
F. A. Chambill, MBA Indiana; O. S. Johnson, Ph.D., Georgia; R. C. Maday, Ph.D., Texas; C. W. Neel, Ph.D., Alabama; M. C. Rush, Ph.D., Akron.

Assistant Professors:
J. A. Bachmann, Ph.D., Virginia Polytechnic Institute; K. C. Gilbert (Vita), Ph.D., Tennessee; R. L. Tadd, Ph.D., Georgia; G. B. Roberts, MBA Georgia State; C. R. Woodall, Ph.D., Texas Tech.

MBA Concentrations: Management, Forest Industries Management.

MBA Concentration: Management.

Minimum Course Requirements for MBA Concentrations: Management—As approved by the area faculty advisor. Forest Industries Management—5110, 5130; Forestry 5280, 5270.

5600 Thesis (1-15) E

5002 Non-Thesis Graduation Completion (3-19) E Required for the non-thesis student not otherwise registered during any quarter when such a student uses university facilities and/or faculty time before a degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E

5010 Organization Theory and Behavior (3) Basic concepts of organization theory, organizational behavior and management processes.

5020 Operations Management (3) Management processes of planning, operating and control of production systems. Management concepts and quantitative techniques with systems framework to operate production problems. Prereq: 5010; Management Science 5100; Statistics 5020, F, Sp, Su

5110 Organization Theory (3) Analysis and design of organization structure. F

5130 Managerial Planning and Control (3) Processes of management planning and controlling with emphasis on corporate strategic planning. Sp


5170-80-90 Seminar in Industrial and Organizational Psychology (3, 3, 3) Introduction to basic concepts and ideas required for graduate study in industrial and organizational psychology. Must be taken in sequence. Same as Psychology 5170-80-90. F, W, Sp

5210 Personnel Management (3) Analysis and appraisal of the personnel function. F

5220 Wage and Salary Administration (3) Analysis of problems, programs, and practices. W

5230 Human Problems in Administration (3) Review and critique of research in industrial human relations. (Same as Psychology 5450.)

5250-60 Industrial and Organizational Psychology (1-3, 1-3) Readings in industrial and organizational psychology available only by permission with supervising faculty member. May be repeated. Maximum 6 hrs. S/NC or letter grade. E

5280 Independent Study, Project or Research in Management (1-3) Topic of mutual interest to student and faculty advisor only by permission with supervising faculty member. May be repeated. Maximum 6 hrs. S/NC or letter grade.

5320 Management Problems in Industrial Research (3) Basic administrative problems encountered in management of industrial research and engineering programs, and comparable problems in which personnel predominating. F, A

5410-20-30 Production Management (3, 3, 3) Quantitative approach to solution of production management problems. Prereq: 5020 or consent of instructor.

5610 Organizational Behavior (3, 3) Behavioral methodology and perspective, including review of empirical behavioral research in organizations. Must be taken in sequence. F, W

5630 Research Methods in Management (3) Methodological issues in management research. Review of experimental design, measurement problems, data sources and collection, and application of statistical methods, followed by critique of student research proposals. Prereq: DBA student status or consent of instructor. S/NC only. Sp

5710 International Business Management (3) Analysis of environment of international business firms and impact of internal and external factors on managerial decisions. Sp

5810 Energy Management: Theory and Practice (3) Management of energy resources in operating systems: decision criteria, trade-offs, system analysis, energy audits, technical parameters, conservation methods, worldwide energy supply and demand, new energy technologies.

6000 Doctoral Research and Dissertation (1-18) E

6110 History of Management Thought (3) Significance of historical ideas leading to present state of art of management.

6120 Advanced Organizational Theory (3) Analysis of functioning of complex organizations: structure, culture, and adaptation.

6130 Seminar in Contemporary Management Issues (3) Controversy in management policy issues. May be repeated.

6250-60-70 Seminar in Industrial and Organizational Psychology (3, 3, 3) Advanced problems in organizational psychology. Areas include performance evaluation, executive development, group process, and morale. (Same as Psychology 6250-60-70.)

6380 Seminar in Industrial and Organizational Psychology (3) (Same as Psychology 6380.)

6900 Field Work in Industrial and Organizational Psychology (1-15) Supervised on-the-job work for each 30 hrs of such practice. Maximum 15 credits. (Same as Psychology 6900.) F

Management Science

MAJOR DEGREE
Management Science Ph.D.

Management Science Committee:

MBA CONCENTRATIONS

For students whose MBA concentration area is Management Science, the MBA Core is revised as follows: substitute Management Science 5310 for 5010, and with approval of student's advisor, substitute Statistics 5120 for 5200. The
The objectives of the program are:

1. To provide, through management science course work, a thorough knowledge of common Management Science Operations Research mathematical models and their uses;
2. To provide sufficient advanced study in a supporting area to qualify the graduate for a joint faculty position in the supporting area and management science. The candidate may choose from the business functional areas (accounting, finance, marketing, production management, and transportation and logistics) or other disciplines (e.g., computer science, statistics, 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 19.

Course work: A minimum of 72 quarter hours of course work taken for graduate credit (exclusive of thesis or dissertation) is required. The candidate must complete a minimum of 36 quarter hours at The University of Tennessee, Knoxville, at least 9 of which must be at the 6000 level. Entering students who have completed graduate study in an applicable field will be granted course credits for work which is equivalent to required courses in the program.

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

Qualifying Examinations: The student must demonstrate mastery of probability theory and statistical inference (Statistics 5110-20-30) by passing a written qualifying examination. Mastery of 18 to 21 quarter hours in mathematics course work must be demonstrated by passing a written qualifying examination. Topics normally include numerical analysis (either Mathematics 4225, 4245, 4060 and 5655, or Mathematics 5655-65-75) and real analysis (Mathematics 4510-20-30). Other options may be approved. In exceptional cases the faculty will consider waiving the mathematics and/or statistics qualifying examinations.

There is no foreign language requirement.

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

Comprehensive Examination: Prior to admission to candidacy for the degree, and normally after completion of the second year of the program, the student must pass a written comprehensive examination covering the theory of deterministic and stochastic management science models. Topics included in this examination are determined on an individual basis. Students will be expected to demonstrate an integrative ability that goes beyond the specific course work for linear content. Research and Dissertation: The student must complete 36 quarter hours of Management Science 6600, Doctoral Research and Dissertation, through which he/she is expected to make a significant contribution to the dissertation. A final oral examination is conducted over the dissertation and such other segments of the program that the faculty so approves. 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 (1-15) E

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


5335 Mathematical Programming Computational Systems (2) Practical aspects of using state-of-the-art mathematical programming systems. Students will write compatible matrix generation and report writing software for specific applications. Sp

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

5810 Special Topics in Management Science (3) Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

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

6000 Doctoral Research and Dissertation (3-15) E

6110-20-30 Models for Production Systems (3, 3, 3) Seminar providing research practice to enhance professional development of doctoral students. Investigation of state-of-the-art mathematical models for production processes and opportunities for original research. 6210-20 Network Flows (3, 3) In-depth treatment of widely applied network optimization algorithms including transportation, minimum spanning tree, maximum flows, and primal and dual optimization methods; multicommodity, multiterminal and dynamic flows; flow with gains; and other advanced topics. Prereq: 5310 or equivalent. A

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

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

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

6510 Markovian Decision Models (3) Formulation and analysis of Markov Chain models. Markov chain models which incorporate decisions—their formulation, application and solution through policy iteration. Stochastic dynamic programming models in continuous time. Prereq: 5330. F

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

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

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

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

Marketing and Transportation

G. N. Dicer (Head), DBA Indiana.

Marketing

Professors: D. J. Barnaby, Ph.D. Purdue; E. O. Dille (Emeritus), Ph.D. Ohio State; E. F. Costain (Emeritus), Ph.D. Ohio State; G. E. Hult, DBA Indiana; R. B. Woodruff, DBA Indiana.

Associate Professors: E. R. Cadoff, Ph.D. Ohio State; R. L. Jenkies, Ph.D. Ohio State; J. R. McMillan, Ph.D. Ohio State; R. C. Reizenstein, Ph.D. Cornell; G. D. Sentiell, DBA Indiana; S. P. Spire, Ph.D. Georgia.

Assistant Professors: F. L. Barbour, Ph.D. Illinois; L. R. Duftus, Ph.D. Purdue.

MBA Concentration: Marketing.

DBA Concentration: Marketing.

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

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

5010 Marketing and Distribution Management (3) Analysis of current marketing and distribution structure institutions, functions, and marketing literature. Systems concepts and analytical decision process. Prereq: Accounting 5010; Economics 5010. Prereq or coreq: Statistics 5010, 5020, 5030, 5040, 5050.

5020 Marketing Strategy and Decision Making (3) Management of basic marketing functions. Integration of functional decisional areas into development
of marketing strategy, both domestic and international. Prereq: 5010. Prereq or coreq: Economics 5200; Statistics 5010, F, Sp, Su.

5210 Sales Force Management (3) Basic communication theory affecting objectives and problems of sales force management. Recruitment, selection, training, motivation, evaluation, and control of sales force. Techniques of territory, district, and route planning. Prereq: 5200. F

5220 Promotion Management (3) Management of promotional activities within firm; advertising, publicity, and sales promotion. Emphasis on advertising, selecting objectives, budgeting, segmentation, media selection, and evaluation of effectiveness. Prereq: 5300. Sp.


5300 Marketing Research (3) Investigation and solution of problems; application of research methods to functional areas of marketing. Research concepts; methods, and techniques. Prereq: 5200. Statistics 5010. F, W.

5350 Buyer Behavior Analysis for Marketing (3) Buyer behavior patterns with emphasis on implications for marketing strategy and execution of marketing and behavioral sciences. Prereq: 5300. F, Sp.

5400 Analyzing Market Opportunity for Marketing Decisions (3) Plants of opportunity within markets, framework for identifying and organizing information required to assess market opportunity. Approaches to analyzing buyers in markets, forecasting extent of demand, analyzing industry/channel/competitor service. Emphasis on applying market opportunity analysis results to marketing decision making. Prereq: 5200. W.


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

5990 Research in Marketing (3) Directed research on individual interest to student and staff member. Prereq: 5200 and 5300. May be repeated. Maximum 6 hrs.

6000 Doctoral Research and Dissertation (3-15) E

6050 Macro/Theoretical Foundations of Marketing (3) Fundamental nature and history of marketing practices. Analysis of marketing theories, developing marketing discipline and in research process. Environmental and policy dimensions of marketing decision making. Prereq: Consent of instructor. A.

6100 Design and Measurement in Marketing Research (3) Advanced design and measurement issues. Theoretical scaling considerations, application of multidimensional scaling techniques, and conjoint analysis. Prereq: Consent of instructor. A.

6150 Marketing Research Applications (3) Application of multivariate research tools to functional areas of marketing. Prereq: Knowledge of multivariate analysis and consent of instructor. A.

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

6250 Selected Problems in Consumer Behavior (3) Information search processes, attitude models, attributes, and consumer satisfaction. Prereq: Consent of instructor. A.

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

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

Transportation and Logistics


Associate Professors: J. H. Foggins, DBA Indiana; C. J. Langley, Jr., Ph.D. Pennsylvania State; R. A. Mundy, Ph.D. Pennsylvania State.

MBA Concentration: Transportation and Logistics

DBA Concentration: Transportation and Logistics

Minimum Course Requirements for MBA Concentration: 18 credit hours required including 5010, 5110, 5130, 5220.

5200 Transportation Analysis and Logistics (3) Intensive survey of logistical demands made by society and specific users on nation's transportation system; problems facing carriers and government.


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

5130 Carrier Transportation Management (3) Analysis of major transportation modes and their managerial strategies. Consideration of how social, technical, legal, and financial environment affects top level decision making. Application of general principles to transportation decision making in an uncertain environment.

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

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

5810 International Transportation Policy (3) Comparative analysis of transport systems in other countries. Analysis of U.S. policy relative to international policy. Prereq: Management 5020. W.

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

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

6000 Doctoral Research and Dissertation (3-15) E

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

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

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

Office Administration

J. Stallard, Program Director

Professors: E. W. Davis (Emeritus), M.S. New York; D. Reese, Ph.D. Iowa; E. R. Smith, Ph.D. Ohio State; J. Stallard, Ph.D. Ohio State; G. A. Waggoner (Emeritus), M.S. Indiana.

Associate Professor: E. W. Davis, Jr., Ed.D. Tennessee.

Assistant Professors: P. D. Campbell, M.S. Austin Peay; H. Petree, M.S. Tennessee.

Courses numbered below 5000 are not available for credit in the MBA program.

4310 Business Letter Writing (3) Principles, practices, and mechanics of effective business letters and memoranda; principles applied by solving communication cases; emphasis placed on letters and memos as initial sources of ideas in communications system of the business firm. E

4320 Business Report Writing (3) Basic principles and procedures of originating and disseminating business reports, both formal and informal in style; writing techniques for short and long reports; graphic presentation and interpretation; use of primary and secondary data for reports. E

4420 Advanced Transcription (3) Improvement of ability to transcribe mailable copy from dictation of a wide variety of correspondence; emphasis on competencies needed to meet occupational standards. Prereq: 4410. F.

4510 Office Management (3) Strategic and operational planning of office objectives; relating tasks and human resources to objectives; planning, selection, training, and development of office staff; directing of office staff through leadership, motivation, and communication; measurement of office performance, comparison to standards, and corrective actions; and applications of decision making to the office. Sp.


4810-20-30 Problems in Office Administration (1-3, 1-3, 1-3) Subject and title vary each quarter. May be repeated. Maximum 3 hrs for each course.

5011 Problems in Lieu of Thesis (3)

5050 Data Processing in Business (3) Fundamental nature and history of data processing, computer programming and applications, systems design. Available only as stated on page 33. E
Statistics

MAJOR

Statistics

DEGREE

M.S.

Professors:

C. C. Thiagen (Head), Ph.D. Virginia Polytechnic Institute; D. S. Chambers (Emeritus), MBA; Tim; R. A. McLean, Ph.D. Purdue; J. W. Philpot, Ph.D. Virginia Polytechnic Institute.

Associate Professors:

H. A. Lasseter, Ph.D. Rutgers; R. D. Sanders, Ph.D. Texas; D. J. Wheeler, Ph.D. Southern Methodist; M. S. Younger, Ph.D. Virginia Polytechnic Institute.

Assistant Professors:


THE MASTER'S PROGRAM

The M.S. 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:

Statistics Major Area

Quarter Hours

Probability theory............................................. 3
Theory of statistical inference............................... 6
Additional coursework in statistics as approved by the student’s committee............................ 9
Additional coursework as approved by the student’s committee............................................ 9

Minor Area

Selected with the approval of both the Department of Statistics and the department in which the work is to be taken.......................................................... 9
Thesis* ...................................................................... 9

Total minimum hours........................................... 45

MBA CONCENTRATION

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

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

3450 Statistics for Engineering (3) Survey of statistical methods with special application for engineering students: frequency distributions, selected sampling distributions, some tests of significance. Cannot be taken for credit concurrently with 2100. Prereq: Mathematics 2840.

4250 Nonparametric Methods (3) Measures of association, two-sample tests, analysis of variance with ranked data, paired and multiple comparisons in preference testing; questionnaire evaluation. Sp

4310 Regression Analysis (3) Linear regression and correlation, multiple regression, stepwise methods, polynomial regression, use of dummy vari-

4410 Design of Experiments (3) Principles and procedures for efficient experimental design. Randomization, choice of size and number of experimental units, utilization of blocking arrangements. Interpretation of experimental data. W, Su

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

5000 Thesis (1-15) E

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

5010 Probability and Statistical Inference (3) Fundamentals of probability, discrete and continuous probability models, mathematical expectation, and inference concerning means. Prereq: Mathematics 5052 or equivalent and a computer programming course. May not be taken for credit by students who receive credit for 5110. F, W

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

5050-60-70 Statistical Analysis for the Behavior Sciences (3, 3, 3) 5050—Probability distributions, sampling distributions, estimation and hypothesis testing. Parametric and nonparametric procedures. Prereq: 1 yr college mathematics and one course in statistics. 5050—Linear and multiple correlation methods, correlation for ranked and grouped data. Continuation of 5050. 5070—Analysis of variance and covariance; design of experiments. Parametric procedures. A continuation of 5050. F; W; Sp

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

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


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


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

6070 Factor Analysis (3) Principal component analysis and principal factor analysis; estimates of communalities; methods of rotation; interpretation of factors; cluster analysis. Prereq: 6050. Sp

6210 Stochastic Processes II (3) Special analysis, time series, linear and nonlinear systems. Prereq: 5210.
College of Communications

Donald G. Hileman, Dean
Paul G. Ashdown, Assistant Dean for Undergraduate Studies
Herbert H. Howard, Assistant Dean for Graduate Studies and Research

The College of Communications offers two graduate degrees with a major in Communications, the Master of Science (M.S.) degree and the Doctor of Philosophy (Ph.D.) degree.

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

The M.S. program (professional track) is accredited by the American Council on Education for Journalism. The College is a member of the American Association of Schools and Departments of Journalism and the Broadcast Education Association.

The doctoral program in Communications is listed in the Academic Common Market of the Southern Regional Education Board. Students residing in Alabama, Georgia, Kentucky, South Carolina, Virginia, and West Virginia can normally qualify for in-state fee status by applying to the Academic Common Market coordinators in their state capitals.

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 mass media and other fields of applied communications, or (2) a deeper understanding of the communication process and the social role of the mass media. The prospective student who is interested in acquiring basic skills in journalism, advertising, or broadcasting is advised to consider a second baccalaureate rather than an advanced degree. (Note: There is no M.S. in Journalism or Advertising or Broadcasting at this institution. Students desiring a major in one of these fields must take the B.S. program.)

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

New students may be admitted to the program at any time; however, beginning enrollment is limited to the summer and fall quarters each year. Unless necessary materials are received at least six weeks before registration, applications may not be processed in time for admission to full potential candidate status in the first quarter. In these cases, the student may still qualify for non-degree or provisional status.

The student may choose either of two tracks, both leading to the M.S. in Communications and both requiring a thesis:

The academic track is designed for the student who wishes to emphasize advanced study of the theory and effects of human communications. A minimum of 45 hours of approved graduate work is required:
-12 hours of core courses:
  Communications 5100, 5120, 5140 and 6100, the first three of which must be taken during the first two quarters of the student's program, except with written approval of the Assistant Dean for Graduate Studies for the College.
-24 hours of selected courses within the College, including at least 9 hours at the 5000 level;
-9 hours of thesis work (Communications 5000).

The professional track is designed for the student who desires the graduate degree but wishes to emphasize a particular professional area, such as advertising, broadcasting, journalism, or public relations. A minimum of 45 hours of approved graduate course work is required:
-9 hours of core courses:
  Communications 5100, 5120 and 5140, which must be taken during the first two quarters of the student's program, except with written approval of the Assistant Dean for Graduate Studies for the College;
-15 hours in a major area within the College, including at least 6 hours at the 5000 level;
-9 hours of thesis work (Communications 5000);
-at least 12 hours in a minor area approved by the major advisor, of which at least 6 hours must be at the 5000 level.

In addition, students with Bachelor's degrees in other cognate areas will be required to complete prerequisites as designated by their advisors. Advising for the professional track will be supervised by the chairperson of the appropriate department of the College. Students who have had no courses in their major areas of concentration may expect to spend six or more full-time quarters in the program.

After the formal program of courses and research in either track is completed, the student must pass an oral examination conducted by his/her graduate committee.

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

DOCTOR OF PHILOSOPHY

The Ph.D. degree with a major in Communications is intended to prepare scholars for teaching, research, administration, and service in the field of human communications.

The program is interdisciplinary, consisting of a required core curriculum and recommended emphasis outside the College in the related social and behavioral sciences.
The program is flexible and will accommodate a wide variety of career goals in communications. The Master's degree is not required for entry into or completion of the doctoral program. Program planning, however, will permit the Master's degree to be earned if desired. Students lacking academic or professional experience in communications will be required to take prerequisite courses. In general, however, the program may be completed within three academic years of full-time study beyond the Bachelor's degree.

The following are normal minimum requirements for admission to full potential candidate status: (a) a 3.0 (4.0 system) grade point average in undergraduate studies, or 3.5 for graduate work if applicant holds a Master's degree; (b) above the fiftieth percentile in verbal and quantitative aptitude on the Graduate Record Examination; (c) completion of the California Psychological Inventory; (d) endorsement by at least three former teachers or professional workers in the field of communication chosen by the Ph.D. Admissions Committee; (e) a statement of the applicant's goals and reasons for pursuing the doctorate. Personal interviews with members of the Ph.D. Admissions Committee may be required. Professional experience in some field of communications is a highly desirable criterion for admission.

The following program represents work normally required for an individual with only the Bachelor's degree and no technical competence: (a) prerequisite courses offered by the College of Communications and approved by the major advisor for applicants lacking the necessary academic or professional background; (b) core curriculum: 33 hours of course work; (c) primary concentration in communications: 15-18 hours of course work; (d) secondary concentration in a cognate minor subject normally outside communications: 12 hours of course work; (e) technical competence area in either teaching, research, or administration: 15-18 hours of course work and, for those who lack appropriate professional experience, an internship the equivalent of 9 credit hours; (f) research tool: 12 hours of course work, e.g., statistics, foreign language, or computer science; (g) dissertation: 36 hours of Communications 6000.

The following courses represent the required core curriculum (beyond the Bachelor's degree): Communications 5100, 5120, 5140, 6100, 6200. One of the following: Communications 6300, 6310, 6320.

For the teaching or administrative technical competence area: a one-week, non-credit seminar in the philosophy and practical problems of teaching and public communication; (b) to disseminate research-generated information and (c) to provide research services to faculty and students, professional communicators, and others interested in improving the quality of human communications.

Communications Research Center

The Communications Research Center is a vital adjunct to the communications graduate program. Objectives of the Center are: (a) to conduct original research in the field of communication; (b) to disseminate research-generated information; and (c) to provide research services to faculty and students, professional communicators, and others interested in improving the quality of human communications.

Department of Instruction

Planned course offerings in the College of Communications for any academic year are published in the College newsletter the preceding November. This information is available from the Dean's Office, 302 Communications Building, 974-3031.

Communications

MAJOR DEGREES

Communications

M.S., Ph.D.

Professors:


Associate Professors:

G. A. Everett, Ph.D. Iowa; M. W. Singletary, Ph.D. Southern Illinois.

5000 Thesis (1-15) E

5602 Non-Thesis Graduation Completion (3-15) Required for the non-thesis student not otherwise registered during any quarter when such a student uses university facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N/C only, E

5100 Introduction to Graduate Studies (3) Scope and methods of advanced study in communications. Information sources, literature review methods, scholarly style, thesis and degree requirements and procedures, overview of traditional and behavioral research methods. Su, F

5120 Research Methods (3) Research, strategy and methodology. Scientific process, bases for derivation and verification of hypotheses, and basic methods of designing research in communications. Su, F

5130 Advanced Principles of Mass Communications (3) Probemair case studies, all phases of mass communications including history, development and current status of communication industry, principles of broadcasting, and principles of advertising.

5140 Mass Communication Theory (3) Critical appraisal of selected hypotheses and theoretical orientations in research literature of mass media. Introduction to theoretical conceptualization and its relationship to research methodology. Application of these orientations to contemporary mass communication problems. Prereq: 5100. Recommended prereq: 5120, F, W

5150 Seminar in Communications Issues (3) Contemporary topics in communications. Prereq: 5100 and 5140, or consent of instructor. May be repeated. Maximum 6 hrs.

5970 Independent Study (3) Reading, research, or projects on special topics in communication. On individual basis, under faculty direction, with consent. May be repeated.

6100 Doctoral Research and Dissertation (3-15) E

6100 Seminar in Communications Theory (3) In-depth analysis of selected theories and supporting research data dealing with source, message, media, receiver, or situational variables in process of communication. Prereq: 5140.

6200 Seminar in Communication Topics (3) Identification, presentation and analysis of special issues and problems in communication. Organization and strategy in writing research proposals. Prereq: 5100, 5120, 5140. Recommended prereq: 6100 or consent of instructor.

6300 Survey Research Methods in Communications (3) Survey research methods applied to opinion and communications media research problems. Planning, sampling, questionnaire construction, data gathering (personal, mail, and telephone), data processing and interpretation. Attitude measurement and message pretesting applications. Prereq: 5120 or consent of instructor. Prereq or coreq: Basic statistics.

6320 Seminar in Historical Research Methods in Communications (3) Materials and methods in historical, descriptive, and legal research in communications theory and behavior. Prereq: 5100, 5120. Recommended prereq: 5140, 6100. Su

Advertising

Professors:

R. Joel (Head), M.A. Wisconsin; A. D. Fletcher, Ph.D. Illinois, D. G. Iselin, Ph.D. Illinois.

Assistant Professor:


3630 Advertising Copy and Layout (4) Ideas and their translation into persuasive words and pictures. Principles and techniques of copy and layout. Literature and ads. Prereq: 3000 with grade of "C" or better or consent of instructor. F, W, Sp

4000 Advanced Advertising Copy and Layout (4) Creative strategy and execution of advertisements for mass media. Problems in idea creation for advertising. Lectures and labs. Prereq: 3630 with grade of "C" or better or consent of instructor. F, W, Sp

4360 Advertising Media (3) Media, markets, and audiences. Evaluation of media in relationship to communication needs of advertisers. Prereq: 3000 with grade of "C" or better or consent of instructor. E

4460 Cases and Problems (3) The case approach to study of advertising problems. Analysis of campaigns and trends. Prereq: 3630, 3650 and 4360 with grade of "C" or better or consent of instructor. F, W, Sp

4470 Advertising Campaigns (4) Application of theory in planning and execution of campaigns. Market research and new market communication program and allocation of budgets. Choice of appeals and
approaches; media selection; preparation of advertising. Prereq: 3660, 4000 and 4360 with grade of "C" or better or consent of instructor. F, W, Sp.

5310 Current Issues in Advertising (3) Current socioeconomic, legal, ethical, and cultural issues in advertising and communication to determine advertising roles and responsibility toward society. Emphasis on both marketing and behavioral science aspects of advertising. Consideration of creativity, media, ethics, and research. Extensive individual reading; preparation and delivery of papers. 4 hrs and 1 lab. F, W.

5350 Advanced Advertising Research (3) Nature, scope, and application of research including measurement of advertising, media audiences, and evaluation of messages. Prereq: 4460 or consent of instructor.

5510 Creative Projects (3) Creative or problem solving interests related to advertising. Designed for the advanced student who wishes to apply theory and skills to specific problems. Prereq: 4000 and 4460 or consent of instructor. May be repeated.

5970 Independent Study (3) E

Broadcasting

Professors: D. W. Holt (Head), Ph.D. Northwestern; H. H. Howard, Ph.D. Ohio.

D. W. Holt (Head), Ph.D. Northwestern; H. H. Howard, Ph.D. Ohio.

4610 Broadcast Sales Management (3) Problems and practices of television and radio sales, case studies in sales development pricing, promotion, and other areas of sales management. Prereq: 2750 or consent of instructor.

5410 Educational Broadcasting (3) Summary, analysis, evaluation of television and radio broadcasting for educational purposes. Prereq: 4520.

5510 Creative Projects (3) For students having specialized broadcast interests or those who wish extensive directed study in creative writing or production projects. May be repeated. E

5610 Public Affairs Broadcasting (3) News and public affairs function in broadcasting stations and networks, including management, economics, personnel utilization, sources of program materials, ethical and legal aspects. Public affairs program development, particularly press conferences, interviews, and news specials. Prereq: 3610 or consent of instructor. W.

5620 Broadcast Law and Regulations (3) Sociopolitical control of broadcasting; effect of laws, regulations, and public pressures upon station operations. Emphasis on unique situation of broadcasting among media in terms of regulation. Prereq: Journalism 4410 or 5210 or consent of instructor. F.

5630 Broadcast Documentary Writing (3) Role of documentation in radio and television. Research, writing, and critique of documentary programs. Prereq: 4520.

5580 Radio-Television Program Development (3) Planning basic program structures for broadcasting stations. Historical trends in programming and current programming practices as related to audience requirements, governmental policy, and competitive conditions. Individual studies of program development on both local station and network levels. Prereq: 2750 or consent of instructor. F, W.

5970 Independent Study (3) E

School of Journalism

Professors: J. A. Crook (Director), Ph.D. Iowa State; J. B. Haskins, Ph.D. Minnesota; B. K. Leiter, Ph.D. Southern Illinois; D. D. Nimmo, Ph.D. Vanderbilt.


3120 Writing Feature Articles (3) Selection of topics and practice in writing feature articles for newspapers, magazines, and company publications. Prereq: 2220 or consent of instructor.

3410 Communications Law (3) Statutory law and judicial precedents affecting the announcer; professional broadcast student. Prereq: 3710 or consent of instructor. Cannot be taken for graduate credit by communications majors. E

4010 Speech for Broadcasting (3) Fundamental broadcast conditions affecting the announcer; pronunciation and oral interpretation of general American speech. Spanish, Italian, German, and French pronunciation. Prereq: Speech 2311. F, W.

4020 Radio Production (3) Study of radio production, past and present. Familiarization with production techniques. Group and individual production activities. Prereq: 2750 or consent of instructor. Cannot be taken for graduate credit by communications majors. E

4030 Television Production (3) Overview of elements of television production: cameras, sound, lighting, film, videotape recording, optics, and studio control centers. Presented with the layperson and professional broadcast student in mind. Prereq: 4020 or consent of instructor. Cannot be taken for graduate credit by communications majors. E

4040 Advanced Television Production (3) A seminar course in production organization, producing, directing and performing with orientation to the professional broadcast student. Prereq: 4030 or consent of instructor. 2 hrs and 1 lab. F.


4670 Radio-Television Management (3) Business policies and practices of networks and stations. Departmental organization, cost and income figures, sales techniques, promotion, advertising agencies, and governmental regulations. Lectures by commercial broadcasters. Prereq: 2750 or consent of instructor. F, Sp.

4680 Broadcast Sales Management (3) Problems and practices of television and radio sales, case studies in sales development pricing, promotion, and other areas of sales management. Prereq: 2750 or consent of instructor.

5410 Educational Broadcasting (3) Summary, analysis, evaluation of television and radio broadcasting for educational purposes. Prereq: 4520.

5510 Creative Projects (3) For students having specialized broadcast interests or those who wish extensive directed study in creative writing or production projects. May be repeated. E

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5620 Broadcast Law and Regulations (3) Sociopolitical control of broadcasting; effect of laws, regulations, and public pressures upon station operations. Emphasis on unique situation of broadcasting among media in terms of regulation. Prereq: Journalism 4410 or 5210 or consent of instructor. F.

5630 Broadcast Documentary Writing (3) Role of documentary in radio and television. Research, writing, and critique of documentary programs. Prereq: 4520.

5580 Radio-Television Program Development (3) Planning basic program structures for broadcasting stations. Historical trends in programming and current programming practices as related to audience requirements, governmental policy, and competitive conditions. Individual studies of program development on both local station and network levels. Prereq: 2750 or consent of instructor. F, W.

5970 Independent Study (3) E

4130 Editorial Writing (3) Analysis of editorial policies, practices, pages. Writing of editorials and columns, with emphasis on study and use of rhetorical devices and logic. Sp.

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


4410 Mass Media and Society (3) Roles and responsibilities of mass media in society. Critique of mass media performance. Media codes and controls on the media. E.


4580 Investigative Reporting (3) Investigative and interpretive reporting of complex or specialized subjects to place news in perspective or to clarify situations. Emphasis on writing for publication. Prereq: 2220. W.

4710 Public Relations Cases (3) Case studies and application of public relations principles to problems in business and industry, government, institutions, trades and professions; solving problems in public relations situations, sales techniques, sales personnel utilization, sources of program materials, ethical and legal aspects. Public affairs program development, particularly press conferences, interviews, and news specials. Prereq: 3610 or consent of instructor. W.

4810 Journalism in the High School (3) Functions and methods of high school publications. Staff organization, writing and editing techniques, editorial problems, and business management. Sp.

4910 News and Feature Photography (3) Advanced principles and methods in black-and-white photography. Emphasis on news and feature photography, and picture stories. Prereq: 3910 or consent of instructor. W.

4950 International Communications (3) Communication of news and opinion among nations and under varying types of political and economic systems; world news organizations; the press as a factor in international affairs; barriers to the flow of information; comparison of world press systems.

4970 Independent Study (3) May be repeated. Maximum 6 hrs.

5210 Government and the Press (3) Historic and current problems in the relations of executive, legislative, and regulatory bodies with the press in forming and maintaining press relations. Prereq: 3110 or consent of instructor. W.

5250 Public Opinion and Mass Media (3) Nature of public opinion with emphasis on role of press in its formation and how the press in turn is influenced by public opinion. Prereq: 4410 or consent of instructor. W.

5510-20-30 Writing and Editing Projects (3, 3, 3) Specialized writing or editing interests, such as agriculture, politics, labor, finance, science, as technical as well as general publications. Prereq: 2220 or 2230.

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

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

5810 Magazine Editing and Production (3) Analysis of editorial and production problems of general, regional, and specialized publications. Reader interest evaluation. Individual editorial projects. Prereq: Consent of instructor. F.
5950 Communications and International Development (3) Seminar emphasizing mass media in national and international development. Communications and change in developing countries. Problems in international and cross-cultural communications. Prereq: 4850 or consent of instructor.

5970 Independent Study (3)
William H. Coffield, Dean
C. Glennon Rowell, Associate Dean for Instructional Programs
Thomas W. George, Assistant Dean for Support Services
Madge M. Phillips, Director, School of Health, Physical Education, and Recreation
Charles M. Peccolo, Director, Bureau of Educational Research and Service

The faculty of the College of Education is committed to performing three major functions: (1) to provide professional preparation for teachers, administrators, school service personnel, and selected other professionals such as health and recreation personnel at the 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 research and development in education and other areas of responsibility.

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 Specialist in Educational Psychology and Guidance, and the 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.

The Ph.D. program with a major in Education provides five options for study in the departments of Curriculum and Instruction, Educational Administration and Supervision, Educational and Counseling Psychology, Physical Education, and Vocational-Technical Education. The program requirements and the options and emphases are:

The Program

Research Area: 21 Hours
Foreign or Computer Language (demonstrate proficiency): 0-9 Hours
General Core Requirements: Courses in history of education, philosophy of education (two areas must be represented): 6 Hours Minimum
Courses in learning theory, curriculum theory, and administrative theory (three areas must be represented): 9 Hours Minimum
Trans-college seminar—four consecutive quarters: Minimum
Specialization:
Major Option—A minimum of 24 hours normally selected from one or two emphases within the major option: 24 Hours Minimum
Supporting Emphasis—A minimum of 12 hours selected from an emphasis other than those emphases selected in the major option. (May be selected from any one of the five options but not a combination of options): 12 Hours Minimum
Cognate—A minimum of 9 Hours

Options and Emphases

Option I. Administrative Theory and Practice
The Administration of Higher Education
Contemporary Economics and Educational Finance
Educational Planning
Facility Planning
Maintenance of School Plants
Organizational Theory
Personnel Administration
The Politics of Education
The Principalship
School Law
The Superintendency
Supervision

Option II. Theories of Curriculum Development and Foundations of Education
Anthropological, Historical, Philosophical, and Sociological Bases for Educational Planning and Curriculum
Principles and Models for Planning, Developing, and Evaluating Educational Programs
Research Design for Educational Programs

Option III. Instructional Theory and Practice
Principles and Models for Instructional Improvement
Subject Areas of Instruction and Practice: i.e., English, Foreign Languages, Mathematics, Science, Social Studies, etc.
Elementary and Early Childhood Instruction and Practice
Learning Media Services
Physical Education Instruction and Practice
Adapted Physical Education
Vocational-Technical Fields of Instruction and Practice

Option IV. Theories and Practice of Educational and Personal Adjustment
Assessment (Educational, Vocational, Personality)
Behavioral Interventions
Training and Supervision of Counselors

Counseling Theory, Research, and Practice activities such as in-service educational content and instrumental methodology. conducting research, and assisting others in (BERS), located in Claxton Education Bureau of Educational Research and Service publications are channeled through the

Physiological Factors Related to Fitness and Philosophical and Sociological Foundations of Factors Influencing the Learning of Motor Psychological Interventions in School and Ethnic and Sex Fairness in Counseling Educational Measurement and Research Diagnosis and Remediation of Cognitive and Consultation for the Helping Professions


Option V. Foundations of Human Movement Factors Influencing the Learning of Motor Skills Philosophical and Sociological Foundations of Sport and Physical Education Physiological Factors Related to Fitness and Performance

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 instrumental methodology. Educational services include a wide list of activities such as in-service educational programs, consultant 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.

Departments of Instruction

Art and Music Education

C. H. Ball, Head

Art Education

MAJOR Art Education DEGREE M.S.


Associate Professor: H. H. Huff, Ed.S. Peabody.


The Master of Science degree in Art Education is offered for art teachers, supervisors, and art-trained persons holding the Associate Degree. The program provides both thesis and non-thesis options. Moreover, it is possible to achieve Tennessee Certification in art while pursuing the Master's degree program. The thesis option requires 45 quarter hours as follows:

Quarter hours

1. Art Education 5310, 5320, and electives .................................................. 18
2. Education Curriculum and Instruction 5710, and electives ............................................. 9
3. Minor (selected with committee) .......................................................... 9
4. Thesis (Art Education 5000) .............................................................. 9

The non-thesis option requires 45 quarter hours as follows:

Quarter hours

1. Art Education 5210, 5310, 5320, and electives .................................................. 21
2. Education Curriculum and Instruction 5800, and electives ............................................. 9
3. Minor (selected with committee) .......................................................... 9
4. Electives .............................................................. 6

Thesis and non-thesis programs lead to the Master of Science degree in music education. Prerequisite preparation: undergraduate degree or equivalent in music education.

All graduate students in music education must pass proficiency examinations in music theory and applied music.

Requirements for thesis program: 45 quarter hours including thesis (9 hours), the music education major (18 hours), minor areas in music (9 hours), and professional education (9 hours). Required courses: Music Education 5000, 5210, 5220, 5230; Curriculum and Instruction 5710.

Requirements for non-thesis option:

1. Minimum of 51 quarter hours of course work with a minimum of 26 hours at the 5000 level.

2. Evidence of ability to understand and interpret research through completion of:

a. Curriculum and Instruction 5610 or equivalent.

b. Music Education 5710.

c. Satisfactory performance of research activities in required courses in music education listed below.

3. Curriculum:

a. A minor: at least 27 quarter hours in music education.

b. A minor: at least 15 quarter hours in music education.

c. 9 quarter hours in professional education, including Curriculum and Instruction 5610 and Educational Psychology 4760 or equivalents and a 3-hour elective.

With the exception of the required courses listed and with approval of the student's advisor, courses may be selected as described more fully above. This provides the flexibility necessary for the student to pursue in some depth specialized interests and needs in the following areas of music teaching: Elementary; Secondary (Junior and Senior High); Vocal (Choral); Instrumental (Band and Orchestra); and Supervision.

4. Specific course requirements:

a. Music Education 510 (15 quarter hours) including: One seminar (3 hours), 5210, 5240, 5250, 5710.

b. Music: Six quarter hours in applied music (piano; voice; a band or orchestra instrument; or theory and composition).

c. Education (elective of 6 quarter hours): Educational Psychology 4760 or 5050, 5320, or other appropriate course in