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University Calendar for 1996-97

Summer Term 1996

May 30 (Thursday)  Classes Begin
July 3 (Wednesday)  First Session Ends
July 4 (Thursday)  Independence Day
July 5 (Friday)  Second Session Begins
August 7 (Wednesday)  Second Session Ends
August 9 (Friday)  Commencement

Fall Semester 1996

August 21 (Wednesday)  Classes Begin
September 2 (Monday)  Labor Day
October 17-18 (Thursday-Friday)  Fall Break
November 28-29 (Thursday-Friday)  Thanksgiving
December 5 (Thursday)  Classes End
December 6 (Friday)  Study Period
December 7, 9-12 (Saturday, Monday-Thursday)  Final Exams
December 15 (Sunday)  Commencement

Spring Semester 1997

January 15 (Wednesday)  Classes Begin
January 20 (Monday)  Martin Luther King Day
March 24-28 (Monday-Friday)  Spring Break
March 28 (Friday)  Spring Recess
May 5 (Monday)  Classes End
May 6-7 (Tuesday-Wednesday)  Study Period
May 8-10, 12-13 (Thursday-Saturday, Monday-Tuesday)  Final Exams
May 16 (Friday)  Commencement

Summer Term 1997

June 5 (Thursday)  Classes Begin
July 4 (Friday)  Independence Day
July 9 (Wednesday)  First Session Ends
July 10 (Thursday)  Second Session Begins
August 13 (Wednesday)  Second Session Ends
August 15 (Friday)  Commencement

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

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- Commissioner of Agriculture
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- Executive Director, Tennessee Higher Education Commission

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- Roger Dickson, Chattanooga
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- Carl Johnson, Brentwood
- Amon Carter Evans, Columbia
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- Roy C. Flowers, Nashville
- J. Houston Gordon, Esq., Covington
- Jonnie D. Amonette, Memphis

DISTRICT TERM EXPIRES

First June 1, 1999
Second June 1, 2001
Third June 1, 2002
Fourth June 1, 1996
Fifth June 1, 1997
Sixth June 1, 1995
Seventh June 1, 2000
Eighth June 1, 1996
Ninth June 1, 2001

TERM EXPIRES

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Student Member

- Suzanne Schaeffer

Faculty Member

- Paul J. Phillips

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- J. Steven Ennis, Vice Chairman
- Beauchamp E. Brogan, Secretary
- Linda Logan, Assistant Secretary

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- J. Steven Ennis June 1, 2000
- From Davidson County
- Clay McWhorter June 1, 1999
- From Hamilton County
- Paul J. Kinser June 1, 1996
- From Knox County
- Susan Richardson-Williams June 1, 2001
- James A. Haslam II June 1, 2001
- From Shelby County
- King W. Rogers, III, Esq. June 1, 1996
- Edward W. Reed June 1, 1996

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Billy Stair, B.A., M.A., Executive Assistant to the President
Emerson H. Fly, B.S., CPA, Executive Vice President and Vice President for Business and Finance
Homer S. Fisher, B.S., M.B.A, Senior Vice President
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- C. Warren Neel, B.S., M.B.A., Ph.D., Dean of the College of Business Administration
- Dwight L. Teeter, A.B., M.M., Ph.D., Dean of the College of Communications
- Richard Wisniewski, B.S., M.Ed., Ed.D., Dean of the College of Education
- Jerry E. Stoneking, B.S., M.S., Ph.D., Dean of the College of Engineering
- Jacquelyn O. DeJonge, B.S., M.A., Ph.D., Dean of the College of Human Ecology
- Richard S. Wirtz, B.A., M.P.A., J.D., Dean of the College of Law
- Joan Creasia, B.S.N., M.S.N., Ph.D. R.N., Dean of the College of Nursing
- Eunice O. Oratz, B.A., M.S., Ph.D., Dean of the College of Social Work
- G. Michael H. Shires, B.S., M.S., M.R.C.V.S., Dip. A.C.V.S., Dean of the College of Veterinary Medicine
- Laverna B. Lindsay, B.S., Ed.D., Associate Vice Chancellor and Dean of Continuing Studies and Distance Education
- Susie C. Archer, B.S., M.A., Dean of Admissions (Undergraduate) and Records
- Raymond A. Popp, B.S., M.A., Ph.D., Director of the UT-Oak Ridge Graduate School of Biomedical Sciences
- Jose-Marie Griffiths, B.Sc., Ph.D., Director of the School of Information Sciences
- Paula T. Kaufman, A.B., M.S., MBA, Dean of Libraries
The Graduate School Administration

C.W. Minkel, B.A., M.A., Ph.D., Associate Vice Chancellor and
Dean of The Graduate School
Linda R. Painter, B.S., M.S., Ph.D., Associate Dean of The
Graduate School
Michael Singletary, B.A., M.A., Ph.D., Associate Dean of The
Graduate School
S. Kay Reed, B.S., M.S., M.A., Ph.D., Assistant to the Dean
Ann L. Lacava, Thesis/Dissertation Consultant

Diana C. Lopez, B.S., M.S., Director, Graduate Admissions and
Records
Brenda Reyman, B.A., M.A., Assistant Director, Graduate
Admissions and Records
Rose Ann Tranham, Assistant Director, Graduate Admissions and
Records

Ms. Paula Kaufman, Dean of Libraries
Dr. Jim Moran, College of Human Ecology
Dr. Linda Painter, The Graduate School
Dr. David Patterson, College of Architecture and Planning
Dr. Donald R. Pitts, College of Engineering
Dr. Ray Popp, Graduate School of Biomedical Sciences
Dr. Leon Potgieter, College of Veterinary Medicine
Dr. K. C. Reddy, UT Space Institute
Dr. Gary Schneider, College of Agricultural Sciences and Natural
Resources
Dr. Michael Singletary, The Graduate School

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--- | --- | --- | ---
 | Mr. Jon Coddington | July 31, 1998 | Mr. J. William Rudd
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 | Dr. Larry Coleman | July 31, 1998 | Dr. Ian Rickett
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 | Dr. Majid Keyhani | July 31, 1997 | Dr. Elden DePorter
 | Dr. A. J. Baker | July 31, 1998 | Dr. Paul Bienkowski
 | Dr. Paul Crilly | July 31, 1998 | Dr. Peter Groer
 | Dr. Jack Weitsman | July 31, 1998 | Dr. Michael Singletary
Graduate Student Association | Mr. Matt Hardin | April 30, 1996 | Ms. Nancy Canevaro
 | Ms. Anita Teague | April 30, 1996 | Dr. Cheryl Buechler
 | Mr. Brian Copeland | April 30, 1996 | Dr. Delores Smith
Human Ecology | Dr. Dileep Sachan | July 31, 1996 | Dr. Nancy Canestaro
 | Dr. Jim Bailey | July 31, 1996 | Dr. Cheryl Buechler
 | Dr. Jay Whelan | July 31, 1996 | Dr. Delores Smith
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Nursing | Dr. Pat Droppleman | July 31, 1998 | Dr. Inez Tuck
School of Information Sciences | Dr. Michael Pemberton | July 31, 1997 | Dr. Nancy Canestaro
 | Dr. William C. Robinson
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 | Dr. Tom Cruft, Drs. | July 31, 1997 | Dr. Terri Combs-Orme
 | Dr. Frank G. Collins | July 31, 1998 | Dr. David Markmeter
 | Dr. Kenneth Kimble
Veterinary Medicine | Dr. Ching F. Lo | July 31, 1997 | Dr. U. Peter Sciles
 | Dr. Philip Bochsler | July 31, 1997 | Dr. Kenneth Kimble
 | Dr. Donata Frazier
GRADUATE STUDY
Rules, policies, fees, and courses described in this catalog are subject to change without notice. Refer to Inside front cover.
C. W. Minkel, Associate Vice Chancellor for Academic Affairs and Dean of The Graduate School
Linda R. Painter, Associate Dean of The Graduate School
Michael W. Singletary, Associate Dean of The Graduate School
S. Kay Reed, Assistant to the Dean
Ann L. Lacava, Thesis/Dissertation Consultant
Diana Lopez, Director, Graduate Admissions and Records
Brenda Rayman, Assistant Director, Graduate Admissions and Records
Rose Ann Trantham, Assistant Director, Graduate Admissions and Records

The University of Tennessee is the official land-grant institution for the State of Tennessee, with its main campus in Knoxville. UT Knoxville is the state's oldest, largest, and most comprehensive institution, and is the only state-supported “Research University I” (Carnegie classification) in Tennessee. A wide range of graduate programs leading to master's and doctoral degrees is available. The University offers master's programs in 85 fields and doctoral work in 52. More than 7,500 graduate and professional students are enrolled on and off campus under the tutelage of 1,600 faculty members.

The Graduate School brings together faculty and graduate students as a community of scholars with a common interest in creative work and advanced study. Programs are available to individuals desiring work toward the master's and doctoral degrees or professional certification, those interested in continuing education for updating and broadening their knowledge, and those pursuing postdoctoral research. 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 UTK'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 a diverse student clientele.

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

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

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

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

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

Graduate education has been conducted at The University of Tennessee since 1821. The first known master's degree was awarded in 1827. In 1879 the Board of Trustees created a graduate department with authority to confer the Master of Arts, the Doctor of Philosophy, Civil Engineer, and Mining Engineer degrees. The Graduate Department was renamed The Graduate School in 1912. Although a Ph.D. degree was awarded in 1886 and in 1887, formal doctoral programs were not instituted until 1929 for Biological Sciences at Memphis and 1943 for Chemistry on the Knoxville campus. A Committee on Graduate Study was appointed in 1904 and coordinated the graduate programs until the Graduate Council was formed in 1949. More than 7,600 doctoral degrees and 44,000 master's degrees have been awarded to date.

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

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| *Non-degree students must obtain permission from the department/program head to register for courses in these fields.*
| *Available for the Academic Common Market to residents of reciprocal states. See Fields of Instruction.*
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<td>School of Information Sciences</td>
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<td>Information Sciences*</td>
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<tr>
<td>Aviation Systems (only at UTSI)*</td>
<td>MS</td>
<td>X</td>
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<tr>
<td>Comparative &amp; Experimental Medicine*</td>
<td>MS</td>
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<tr>
<td>Industrial &amp; Organizational Psychology*</td>
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<td>PhD*</td>
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a International applicants only.
b American applicants only.
c G.S. Rating Form submitted to Department.
d Forms obtained from & returned to Department.
e Foreign or computer language.
Admission Requirements

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

The Graduate School requires a minimum grade-point average of 2.7 out of a possible 4.0, or a 3.0 during the senior year of undergraduate study. Applicants with previous graduate work must have a grade-point average of 3.0 on a 4-point scale or equivalent on all graduate work. Many programs require a higher average.

Applicants with work experience or who are entering graduate school after a number of years away from an educational institution, usually 5 years, will be given consideration with greater flexibility relative to GPA. An international student graduating from a U.S. institution must meet the same requirements as those for domestic students.

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

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

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

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

Application Procedures

Anyone with a Bachelor's degree from a regionally accredited institution or foreign equivalent who wishes to take courses for graduate credit, whether or not the person desires to become a candidate for a degree, must make formal application for admission to The Graduate School or apply for transient status. No action is taken until a file is complete. The applicant will be notified by mail of the action taken.

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

1. The completed Graduate Application for Admission (inside front cover of Graduate Catalog).
2. A $15 non-refundable application fee.
3. One official transcript from all colleges and universities attended.
4. Additional departmental/program requirements (refer to Majors and Degree Programs chart in front of Graduate Catalog).
   a. Reference letters or rating forms. All program forms should be sent to the college or department.
   b. Scores from the Graduate Record Examination (GRE) or Graduate Management Admission Test (GMAT).
   c. Scores from Test of English as a Foreign Language (TOEFL) if native language is not English (refer to section on English Proficiency). Application forms for the above tests can be obtained by writing:
      Educational Testing Service
      Princeton, NJ 08540
      UT Knoxville is an approved testing center for all examinations. Examination results reach the University in approximately six weeks.
      All of the above documents become the property of the University and will not be returned.

For international graduate student application procedures, see also Admission of International Students.

Admission Classifications

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

DEGREE ADMISSION

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

In addition to meeting the minimum requirements 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 other evidence of scholarly achievement.

A student must maintain a 3.0 grade-point average to continue enrollment in a degree program (see Academic Standards). An applicant may not be admitted simultaneously to more than one degree program. Two or more applications cannot be considered concurrently. For admission to dual programs, applications are processed consecutively.

NON-DEGREE ADMISSION

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

1. Need additional time to fulfill application requirements for a degree program.
2. Do not wish to pursue a degree program.

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

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

There is no specific limit on the number of courses that a student may take in non-degree status. However, before accumulating 15 hours of graduate coursework in this status, the student must either:

1. Apply and be admitted to a specific degree program (see Revision of Admission Classification for procedures); or
2. File a Plan of Study form with the Office of Graduate Admissions and Records for approval to continue taking courses in non-degree status. The plan of study must include a stated educational objective and a list of courses proposed to achieve that objective.

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

Every graduate student must meet with an academic advisor at least once each semester to discuss his/her program. For non-degree students with a declared major, the advisor must be from the appropriate academic unit. If no advisor has been assigned, the department head or designee is the advisor. For a non-degree student who has no declared major, the Associate Dean of The Graduate School, or designee, is the advisor.

A student must maintain a 3.0 grade-point average to continue enrollment in non-degree status (see Academic Standards). Admission to non-degree status does not assure admission to a degree program. The student who seeks to enter a degree program will be directed to the appropriate department.

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

TRANSIENT ADMISSION

A student who is enrolled in good standing in a graduate degree program at another institution and who wishes to take courses for transfer to that institution may be admitted after submitting a completed Graduate Application for Admission, the $15 application fee, and a Transient Student Certification 10 days prior to registration. Only one semester, or a maximum of 12 hours, of coursework can be taken in transient status. Necessary forms may be obtained from the Office of Graduate Admissions and Records.
Admission of International Students

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

- a. 14 on a 20-point scale.
- b. 80.0 from Taiwanese institutions.
- c. 1st Class or Division from Indian institutions.
- d. Upper 2nd Class Honors on various British systems.

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

An international student may apply for admission any semester, but normally enters the summer or fall semester. Deadlines for submission of applications are:

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<td>Spring</td>
<td>15 July</td>
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<td>Summer</td>
<td>15 November</td>
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The Office of Graduate Admissions and Records must be notified of any change in entering date after admission has been granted.

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

1. A completed application form accompanied by a $50 non-refundable processing fee. Payment should be made in United States dollars by a cashier's check, money order, or personal check. If payment is by personal check, the check must be drawn on a United States bank to be honored in United States currency. Checks drawn on overseas banks are not accepted. International money orders are suggested.

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

3. Certification of English proficiency. Refer to section on English Certification.

4. Documented evidence of financial resources sufficient to support the student, as stated on the financial statement form supplied to the applicant.

5. Additional departmental/program requirements (refer to Majors and Degree Programs chart in front of Graduate Catalog).
   - a. Reference letters or rating forms. All program forms should be sent to the college or department.
   - b. Scores from the Graduate Record Examination (GRE) or Graduate Management Admission Test (GMAT).

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

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<tr>
<td>Spring</td>
<td>1 November</td>
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<tr>
<td>Summer</td>
<td>15 March</td>
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The University will not enroll any student who has not been approved initially, or for transfer, by the Immigration and Naturalization Service (INS) to attend UT Knoxville.

An international student may not enroll as a non-degree student nor on probation.

English Certification

Any person whose native language is not English must submit results of the Test of English as a Foreign Language (TOEFL). A minimum score of 550 is required for admission consideration. Some departments require higher scores. The score must be no more than two years old. Applicants who have received a degree from an accredited U.S. institution within the past two years are exempt from the TOEFL requirement.

All students whose native language is not English must take an English proficiency examination after arrival at UTK. Refer to section on English Proficiency.

Admission of Faculty and Staff Members

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

Faculty members of UT Knoxville or the Institute of Agriculture at the rank of assistant professor or above, and members of the administrative staff at UT Knoxville, the UT Central Administration, and the Institute of Agriculture will not normally be admitted to an Ed.D. or Ph.D. degree program at UT Knoxville. Exceptions may be granted on an individual basis upon petition to The Graduate School. Petitioners must present their request in writing, providing adequate assurance that the residence requirement will be met and that there will be no conflict of academic or administrative interest. Written endorsements must be provided by the respective deans and department heads of the units in which members are employed and in which the doctoral degrees are to be pursued. Requests should be directed to the Associate Vice Chancellor and Dean of The Graduate School.

Readmission

A student who has not attended The Graduate School at UT Knoxville for more than three semesters (excluding summer) must apply for readmission. A readmission application should be submitted to the Office of Graduate Admissions and Records at least two weeks prior to the desired reentry date. A student who has attended another institution since enrollment at UT Knoxville must submit one official transcript showing all coursework and any degrees earned at that institution. The student will be notified when action has been taken by the department/program and The Graduate School. 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.

Revision of Admission Classification

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 Office of Graduate Admissions and Records. The form requires the signature of the head of the department in which admission was previously granted. No signature is needed if a student requests to change from non-degree status to a degree program, or from one degree to another within the same department.

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

Registration and Enrollment Requirements

Graduate Credit

To earn graduate credit, a student must be admitted by the Dean of The Graduate School and enrolled in an appropriate status as a graduate student. The registration must reflect the desire for graduate credit, and the course must have been approved by the Graduate Council. Coursework taken in any other status is unacceptable for graduate credit and cannot be changed retroactively to graduate credit. Special privileges are accorded UT Knoxville seniors and professional students, as stated in the section on Undergraduates and Professional Students.

Courses numbered at the 500-level, as well as those 400-level courses approved for graduate credit, must be taught by faculty members who (1) meet the criteria of an assistant professor or above as defined in the Faculty Handbook and (2) have been designated by the department head as being appropriate. Graduate teaching associates are ineligible to teach courses approved for graduate credit.

Courses at the 600-level are taught by faculty who have been approved by the Associate Vice Chancellor and Dean of The Graduate School to do so. Criteria for eligibility to teach at the 600-level are available from The Graduate School.

Undergraduate and Professional Students

UT KNOXVILLE SENIORS

Subject to approval by The Graduate School, a senior at UT Knoxville who needs fewer than 30 semester hours to complete requirements for
a Bachelor's degree and has at least a B average (3.0) may enroll in graduate courses for graduate credit, provided the combined total of undergraduate and graduate coursework does not exceed 15 credit hours per semester. Approval must be obtained each semester at the Office of Graduate Admissions and Records during registration. A maximum of 15 hours of graduate credit can be obtained in this status. Some departments do not permit seniors to register for graduate courses without prior permission (see Majors and Degree Programs chart for information on restricted programs). Courses taken for graduate credit may not be used toward both the baccalaureate and a graduate degree.

UT KNOXVILLE VETERINARY MEDICINE STUDENTS

A student in good standing in the College of Veterinary Medicine may enroll in UT Knoxville graduate courses without being admitted to The Graduate School under the following conditions: 1. The student’s advisor must approve in advance the student’s enrollment in each course. 2. The student may take a maximum of 10 semester hours of graduate courses during the D.V.M. program. 3. Approval must be obtained each semester at registration through the Office of Graduate Admissions and Records. The student’s progress is subject to review and approval each semester by the Associate Dean, College of Veterinary Medicine.

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

UT KNOXVILLE LAW STUDENTS

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

Law Courses

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

Different rules apply to students enrolled in the Dual J.D.-MBA and J.D.-MPA programs. Grades must be earned according to the grading system of the respective colleges, e.g., numerical grades for law courses, letter grades for graduate courses. Refer to sections on Business Administration, Political Science, and Law under Fields of Instruction for grades acceptable to meet degree requirements.

A student enrolled in the Ph.D. in Business Administration program may use 8 semester hours or more of law courses for the supporting area via the arrangement described under Business Administration. Courses taken for graduate credit may not be used toward both the baccalaureate and a graduate degree.

Senior or Disabled Citizens

Legislation gives Tennessee citizens who are 60 years of age or older, or those who are totally disabled, the opportunity to attend credit and non-credit courses at the University at no charge on an audit, space available basis. Legal verification of either of these conditions is required for enrollment. Students who are 65 or over, or who are totally disabled, and who desire to receive UT credit for their courses, may pay a reduced charge of $7 per credit hour up to a maximum of $75 for a full-time load. Registration for day and evening classes is handled by the Evening School, 451 Communications and University Extension Building, (423) 974-5361 or 1-800-676-8657.

Auditors and Audited Courses

Persons who wish to attend certain classes regularly, without taking examinations or receiving grades or credit, may do so by completing a graduate application, paying the application fee, registering as an auditor, and paying regular fees. Graduate students paying regular fees also are entitled to audit courses.

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

Persons may not attend class without being properly admitted to the University and registered in the class.

Short Courses and Workshops

The University offers a wide variety of short courses and workshops for graduate credit. Minimum criteria acceptable for such credit are as follows:

1. The number of contact hours should never be fewer than the equivalent of one hour per week during the term for each hour of credit awarded, i.e., 15 hours per semester hour.
2. For every contact hour, there should be at least two hours of student preparation.
3. For each hour of graduate credit under the semester system, there should be a minimum elapsed time of one week.

The workload in a short course of several weeks' duration need not be distributed evenly. However, substantial and meaningful interaction between the faculty member and student should be maintained throughout. Graduate credit should not be awarded for courses considered inappropriate as part of a graduate degree program.

The Curriculum Committee of the Graduate Council monitors the policy. Each new course or change in a current course must be approved in both content and format.

Correspondence Study

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

Proficiency Examinations

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

English Proficiency

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

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

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

Advisor/Major Professor

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

Departmental Liaison

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

Registration

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

Information concerning registration is available in the Graduate School News and Timetable of Classes each term. The course registration number may be changed via telephone. During priority registration, a schedule and bill is mailed to the registrant. Payment is due by the deadline noted on the bill. A graduated late fee is assessed to any student who fails to register within the deadline.

Additional information can be obtained from Computer Assisted Registration Services Office, (423) 974-2223.

Course Description

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

The official course title appears following the course number. A symbol indicating the semester or term may be included in parentheses following the course title. The same course title may be repeated in subsequent semesters. The credit hours are followed by a course description indicating the content to be covered.

Prerequisites must be taken prior to or concurrently with the specific course. Recommended prerequisites should be taken previously but are not mandatory.

Some courses may be repeated for a maximum number of hours toward a degree program. This number is stated for each repeatable course with the exception of Thesis 500, Dissertation 600, and Registration for Use of Facilities 502. Courses may be cross-listed with two or more departments, an arrangement indicated by a parenthetical statement: (Same as Psychology 542). The course description is given only under the primary department.

Failure to pay tuition and fees before the deadline, as noted each semester on the schedule/bill, will result in cancellation of the schedule. Retroactive registration is not permitted.

Non-degree students in unrestricted programs (see Majors and Degree Programs Chart) may obtain permission to register from the Office of Graduate Admissions and Records. Non-degree students with no declared major must obtain permission from the department/program head to register for courses in restricted fields.

Conditional Registration

A person who appears to meet the admission requirements of The Graduate School may be allowed to register for an initial term after submitting the Graduate Application for Admission form and application fee. Time is allowed to obtain transcripts and additional requirements for admission. The student who fails to gain admission within seven weeks after registration will not be permitted to register again until all admission requirements are met.

International students may not register conditionally.

Registration for Use of Facilities

Students using University facilities, services or faculty time must be registered. Normally, students are registered for coursework or thesis/dissertation credit. Non-thesis students or those who have not begun research, both of whom have completed all coursework requirements, must register for course 502.

Change of Registration

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

Students who fail to attend the first class meeting without prior arrangement with the department may be dropped from the course to make space available to other students. Students have the responsibility to assure that they have been dropped. Otherwise they may receive a grade of F in the course. Course registration may be changed from audit to credit or credit to audit only during the first 29 calendar days after the beginning of classes.

The deadline for all other changes of registration (e.g. from graduate to undergraduate, undergraduate to graduate, withdrawal) is approximately 42 calendar days after the first day of classes each semester. (See Graduate School News or Timetable of Classes for specific terms.) A student may change registration for a course at any time prior to and including this date by accessing the telephone registration system. The student must affirm that the advisor has granted approval of the change. If additional permission is necessary, a student must execute a change of registration form, in person, at the Computer Assisted Registration Services Office. The instructor’s signature is required to add a course. If the course is closed and/or after the first 29 calendar days of classes, the student must sign and submit the form certifying approval of the advisor.

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

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

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

Course Loads

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

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

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

Registration for more than 15 hours during any semester, or for more than 12 hours in the summer term, is not permissible without prior approval of The Graduate School, which may allow registration of up to 18 hours during a semester if the student has achieved a cumulative grade-point average of 3.6 or better in at least nine hours of graduate work with no outstanding incompletes. No more than 12 hours are permissible in the summer term without prior approval.

Grade-Point Average and Grades

A cumulative grade-point average of 3.0 is required on all graduate coursework taken at UT Knoxville to remain in good standing and to receive any graduate degree from the University. All coursework taken for graduate credit is counted in the GPA.

Grades in The Graduate School have the following meanings:

- **A** (4 quality points per semester hour), superior performance.
- **B+** (3.5 quality points per semester hour), better than satisfactory performance.
- **B** (3 quality points per semester hour), satisfactory performance.
- **C+** (2.5 quality points per semester hour), less than satisfactory performance.
- **C** (2 quality points per semester hour), performance well below the standard expected of graduate students.
- **D** (1 quality point per semester hour), clearly unsatisfactory performance and cannot be used to satisfy degree requirements.
- **F** (no quality points), extremely unsatisfactory performance and cannot be used to satisfy degree requirements.

indicating that the student has performed satisfactorily in the course but, due to unforeseen circumstances, has been unable to finish all requirements. An I is NOT given to enable a student to do additional work to raise a deficient grade. All incompletes must be removed within one semester, excluding the summer term. If a supplementary grade report has not been received in the Office of Graduate Admissions and Records at the end of the semester, the I will be changed to an F. The grade 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. A grade of SI/NC is allowed only where indicated in the course description in the Graduate Catalog. The number of S/NC courses in a student's program is limited to 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 or inadequate progress.

W (carries no credit hours or quality points), indicates that the student officially 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. A graduate student may not do additional work nor repeat an examination to raise a final grade. A change of grade may occur only in cases of arithmetic or clerical error and must have approval of The Graduate School. An instructor may not initiate a change of grade as a result of additional work performed by the student.

Refer to Law Courses Under Registration and Enrollment Requirements and Law Under Fields of Instruction for Law grading system.

Academic Standards

Graduate education requires continuous evaluation of the student. This evaluation includes not only periodic objective evaluation, such as the cumulative grade-point average, performance on comprehensive examinations and acceptance of the thesis or dissertation, but also judgements by the faculty of the student's progress and potential. Continuation in a program is determined by consideration of all these elements by the faculty and the head of the academic unit.

The academic records of all graduate students are reviewed at the end of each semester, including the summer term. Graduate students must maintain a cumulative grade-point average (GPA) of at least 3.0 on all graduate courses taken for a letter grade of A-F. Grades of S/NC, P/NP, and I, which have no numerical equivalent, are excluded from this computation. Departmental programs may have requirements for continuation or graduation in addition to the minimum requirements set forth in this Catalog by The Graduate School. It is the student's responsibility to be familiar with the special requirements of their department or program.

ACADEMIC PROBATION

Upon completion of nine hours of graduate coursework, a graduate student will be placed on academic probation when his/her cumulative GPA falls below 3.0. A student will be allowed to continue graduate study in the fall and spring semesters if each semester's grade-point average is 3.0 or greater. Upon achieving a cumulative GPA of 3.0, the student will be removed from probationary status.

DISMISSAL

If a student is on academic probation, the degree or non-degree status will be terminated by The Graduate School if the student's semester GPA falls below a 3.0 in a subsequent semester. When the particular circumstances may be deemed to justify continuation, and upon recommendation of the appropriate academic unit and approval of The Graduate School, a student on probation whose semester GPA is below a 3.0 may be allowed to continue on a semester-by-semester basis.

Dismissal of a graduate student by a department or program is accomplished by written notice to the student, with a copy to The Graduate School. In those cases where the department's requirements for continuation are more stringent than Graduate School requirements, The Graduate School will evaluate the student's record to determine whether the student is eligible to apply for a change of status and register in another area of study. Registration for courses in a department from which a student has been dismissed will not be permitted, except by written authorization from that department.

Academic Honesty

Academic integrity is a responsibility of all members of the academic community. An honor statement is included on the application for admission and readmission. The applicant's signature acknowledges that adherence is confirmed. The honor statement declares that:

An essential feature of The University of Tennessee, Knoxville is a commitment to maintaining an atmosphere of intellectual integrity and academic honesty. As a student of the University, I pledge that I will neither knowingly give nor receive any inappropriate assistance in academic work, thus affirming my own personal commitment to honor and integrity.

Webster's Ninth New Collegiate Dictionary (1993) defines plagiarism as "stealing or passing off ideas or words of another as one's own"; "the use of a created production without crediting the source." Any material taken from another source must be documented, and in no case should one present another person's work as one's own. Extreme caution should be exercised by students involved in collaborative research to avoid questions of plagiarism. If in doubt, students should check with the major professor and The Graduate School about the project. Plagiarism will be investigated when suspected and prosecuted if established.
Degree Program Requirements

A complete list of programs is found under the Majors and Degree Programs chart. For specific degree requirements, consult individual program descriptions listed by college and field of instruction in this Catalog. See also the summary of procedures charts, and refer to the Graduate School News each semester for specific deadlines. Departmental policies and procedures, which are specific to degree programs and exceed those in the Graduate Catalog, are provided in the Graduate Student Handbook available in each academic department.

The following are the Graduate School’s minimum requirements for degree programs. Refer to the Fields of Instruction for additional program requirements.

Definition of Graduate Terms

Major: The principal educational interest of a student as represented by one of the curricula prescribed by the various units at UT Knoxville. The major specifies the minimal requirements for a degree.

Minor: An area of interest secondary to the major that is represented by a specified set of hours and/or courses. Differ from “concentration” in that a minor is not a subdivision of the major.

Concentration: A collection of courses within a major that focuses on a particular subject area. The term “concentration” describes the nature of the set of courses.


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

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

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

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

Minors

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

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

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

Transfer Credits

Courses taken at another institution may be considered for transfer into a master’s or Ed.S. program as determined by the committee and approved by The Graduate School.

Courses transferred to any graduate program at UT Knoxville, 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 Graduate School on the Admission to Candidacy form.

Courses transferred to a 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 from universities outside The University of Tennessee system cannot be used to meet the 500- or 600-level coursework requirements. Credit for extension courses taken from other institutions is not transferable, nor is credit for any course taken at an unaccredited and/or foreign institution.

MASTER’S DEGREE

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

ED.S. DEGREE

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

DOCTORAL DEGREE

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

Theses and Dissertations

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

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

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

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

Appeals Procedure

The student handbook, Hilltopics, published and distributed annually, contains statements of UT Knoxville standards of conduct and of all disciplinary regulations and procedures. Normally, grievances should be handled at the departmental level through the student’s advisor or the department or program head. Further appeal may be made to the Dean of the respective college, the Dean of The Graduate School, the Graduate Council, and the Chancellor. Any individual may ultimately appeal to the President of the University. A copy of the Appeals Procedure is available in the Office of Graduate Admissions and Records.
comply with these requirements may lead to rejection of a thesis or dissertation manuscript.

Master’s Degrees

Master’s degree programs are available with thesis and non-thesis options. These programs require 30 or more graduate hours of coursework. In addition to the M.A. and M.S. degrees, other degrees are offered, including the MBA and the M.S.S.W.

COURSE REQUIREMENTS

A candidate for a master’s degree must complete a minimum of 30 hours of graduate credit in courses approved by the student’s master’s committee. In thesis programs, 6 semester hours of credit in the major (and 9-12 in some approved programs) must be earned in course 500 while the student is preparing the thesis. Hours applied to the master’s degree may be entirely from one major subject or may be distributed to include one or two minor areas. In a 30-hour program, the major subject must include at least 12 hours of graduate coursework, exclusive of course 500, and a minor must include not fewer than 6, nor more than 12, hours of graduate credit.

At least two-thirds of the minimally required hours in a master’s degree program must be taken in courses numbered at or above the 500 level. Only 6 thesis hours can be counted toward this requirement.

For coursework taken at other institutions, refer to section on Transfer Credits.

SECOND MASTER’S DEGREES

For a second master’s degree, the student must have fulfilled all major requirements applicable to the first master’s degree, including the thesis, if appropriate. Coursework applied to one master’s degree program may not be applied toward a second.

MASTER’S COMMITTEE

A committee composed of the major professor and at least two other faculty members, all 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). The responsibility of this committee is to assist the student in planning a program of study and carrying out research, and to assure fulfillment of the degree requirements. If the student has a minor, one member of the committee must be from the minor department.

ADMISSION TO CANDIDACY

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

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

THESIS REGISTRATION

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

THESIS

The thesis represents the culmination of an original research project completed by the student. It must be prepared according to the UT Knoxville Guide to the Preparation of Theses and Dissertations (6th ed.). Two copies of the thesis must be approved and accepted by The Graduate School on or before the deadline specified each semester in the Graduate School News. Each copy must include an approval sheet, signed by the members of the master’s committee, certifying that they have examined the final copy of the thesis and have judged it to be satisfactory.

FINAL EXAMINATION FOR THESIS AND PROBLEMS IN LIEU OF THESIS

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

FINAL EXAMINATION FOR NON-THESIS STUDENTS

Each non-thesis student must pass a final comprehensive written examination. A department may require an additional oral examination. The examination is not merely a test over coursework, but a measure of the student’s ability to integrate material in the major and related fields. Except with prior approval from The Graduate School, the examination must be given in University facilities. It must be scheduled through the Office of Graduate Admissions and Records in accordance with the deadlines specified in the Graduate School News and will be conducted by the master’s committee. Final examinations not properly scheduled must be repeated. Students taking the final examination but not otherwise using University facilities may pay a fee of $135 instead of registering. In case of failure, the candidate may not apply for reexamination until the following semester. The result of the second examination is final.

TIME LIMIT

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

Specialist in Education Degree

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

Admission to the Ed.S. program requires acceptance by The Graduate School, and review and acceptance by the department or area in which the student is majoring. It is recommended that students who apply for the Ed.S. have at least one year of related work experience. Additional information on admission requirements can be obtained from the academic units offering the degree.

COURSE REQUIREMENTS

The student’s program involves a minimum of four semesters of study totaling not fewer than 60 semester hours of graduate credit beyond the baccalaureate degree. A minimum of 6 hours is required outside the major academic unit or area.

A student admitted to the program with a master’s degree, or with acceptable work beyond the master’s degree, may have program requirements modified upon recommendation of the student’s committee. However, no modifications will be permitted in examination and research requirements, nor in the minimum 6 graduate hours required outside the major. All prior coursework accepted toward the degree must be related to the student’s program objectives. A maximum of 6 hours beyond the master’s degree may be transferred from another institution to an Ed.S. program (refer to section on Transfer Credits).

Courses numbered at the 400 level required for certification through UT Knoxville may not be taken for graduate credit and used as coursework in the major. At least one-half of the last 30 semester hours of work, exclusive of thesis courses, must be in 500- or 600-level courses.
ED.S COMMITTEE

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

RESIDENCE REQUIREMENTS

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

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

ADMISSION TO CANDIDACY

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

The Admission to Candidacy form must be signed by the student’s committee and listed all courses to be used for the degree, including transfer coursework. This form is submitted to the Office of Graduate Admissions and Records before the student has completed 15 hours of coursework in the Ed. S. program. A qualifying examination may be required for admission to candidacy if the student has a master’s degree earned six years or more prior to admission to the program. This examination may be written and/or oral.

RESEARCH REQUIREMENTS

See the program descriptions of individual units for listings of thesis, problems in lieu of thesis, and non-thesis options. Some units offer only a thesis program. 1. In the non-thesis program, a candidate will study research methods and findings and will demonstrate skill in adapting them to professional needs as defined by the major department.

2. In the thesis program, or problems in lieu of thesis, 6 hours of research credit (518 and 519) must be earned in preparation of an acceptable piece of work. The student must continue to register for thesis or problems while working on the project, including the semester it is accepted by the Graduate School. The thesis must be prepared according to instructions in the UT Knoxville Guide to the Preparation of Theses and Dissertations (8th ed.), and approved by the student’s committee prior to submission to the Graduate School for final approval and acceptance.

FINAL EXAMINATION

A candidate presenting a thesis, or problems in lieu of thesis, must pass an oral examination covering the student’s research and program of study. A non-thesis student must pass a final written, or written and oral examination, on all work offered for the degree. The examination is not merely a test over coursework, but a demonstration of the candidate’s ability to integrate materials in the major and related fields. Each examination must be approved through the Office of Graduate Admissions and Records before the deadline and will be conducted in University facilities by the student’s committee. Final examinations not properly scheduled must be repeated. In case of failure, the candidate may not be reexamined until the following semester. The result of the second examination is final.

TIME LIMIT

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

DOCTORAL DEGREES

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

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

PROGRAM OF STUDY

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

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

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

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

DOCTORAL COMMITTEE

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

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

DOCTORAL EXAMINATIONS

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

Diagnostic Examination

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

Qualifying Examination

A written and/or oral qualifying examination may be given near the end of the student’s 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.

Comprehensive Examination

The comprehensive examination (or the final part of this examination, when parts are given at different times) is normally taken when the doctoral student has completed all or nearly all prescribed courses. Thus, its successful completion indicates that, in the judgement of the faculty, the doctoral student can think analytically and creatively, has a comprehensive knowledge of the field and the 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. A written examination is required, and an oral examination is encouraged.

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

Defense of Dissertation Examination
A doctoral candidate must pass an oral examination on the dissertation. The dissertation, in the form approved by the major professor, must be distributed to the committee at least two weeks before the examination. The examination must be scheduled through the Graduate Admissions and Records Office. Examinations not properly scheduled must be repeated. The examination is announced publicly and open to all faculty members. The defense of dissertation will be administered by all members of the doctoral committee after completion of the dissertation and all course requirements. This examination must be passed at least two weeks before the date of submission and acceptance of the dissertation by the Graduate School. The major professor must submit the results of the defense by the dissertation deadline.

LANGUAGE REQUIREMENTS
Candidates for the Ph.D. degree may be required to demonstrate a reading knowledge of at least one foreign language in which there exists a significant body of literature relevant to the major field of study. Please refer to the descriptions of individual programs. The doctoral committee will determine the specific language (or languages) required. When the student is prepared to take a language examination, he/she should complete an Application for Foreign Language Examination at the Office of Graduate Admissions and Records in accordance with the dates and times for the examinations printed in the Graduate School Newsletter.

Satisfactory completion (grade of B or better) of German 332 or French 302 may be substituted for a foreign language.

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

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

For the doctoral degree, a minimum of two consecutive semesters of residence is required. Individual doctoral programs may have additional residence requirements.

A statement as to how and during what period of time the residence requirement has been met will be presented with the Application for Admission to Candidacy along with signatures of approval from the major professor and the Department Head/Program Director. More information about the rationale for the residence requirement may be obtained from the Graduate Council report available in the Graduate School.

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

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

CONTINUOUS REGISTRATION
The student must register continuously for course 600 (minimum of 3 hours) from the time the doctoral research proposal is approved, admission to candidacy is accepted, or registration for course 600 is begun, whichever comes first, including summer semester and the semester in which the dissertation is approved and accepted by The Graduate School. A minimum total of 24 hours of course 600 is required before the dissertation will be accepted. A student who will not be using faculty services and/or university facilities for a period of time may request leaves of absence from dissertation research up to a maximum of six terms (including summer terms). The request, to be made in advance, will be considered by The Graduate School upon written recommendation of the department head.

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

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

Two copies of the dissertation (prepared according to the regulations in the UT Knoxville Guide to the Preparation of Theses and Dissertations, 8th ed.) must be submitted to and accepted by The Graduate School. Each copy must include an approval sheet, signed by all members of the doctoral committee, which certifies to The Graduate School that they have examined the final copy and found that its form and content demonstrate scholarly excellence. Microfilm Agreement form, Survey of Earned Doctorates, Abstract form 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 Degrees and Specialist in Education Degree

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<tr>
<th>PROCEDURES</th>
<th>UNDER DIRECTION OF</th>
<th>DATE</th>
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<tbody>
<tr>
<td>Admission as a potential degree candidate</td>
<td>Office of Graduate Admissions and Records and Major Department</td>
<td>Prior to completing 15 hours of graduate courses</td>
</tr>
<tr>
<td>Formation of master's/Ed.S. committee</td>
<td>Advisor/Major professor</td>
<td>Prior to application for admission to candidacy</td>
</tr>
<tr>
<td>Submission of application for admission to candidacy</td>
<td>Master's/Ed.S. committee</td>
<td>At least one semester prior to graduation*</td>
</tr>
<tr>
<td>Approval of admission to candidacy</td>
<td>The Graduate School</td>
<td>Prior to graduation</td>
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#### GRADUATION REQUIREMENTS FOR NON-THESIS OPTION

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<tr>
<th>Placement of name on graduation list</th>
<th>Student</th>
<th>Indicate on registration materials</th>
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<tr>
<td>Application for diploma</td>
<td>Office of Graduate Admissions and Records</td>
<td>Deadline available at registration *</td>
</tr>
<tr>
<td>Payment of graduation fee</td>
<td>Bursar's Office</td>
<td>Deadline available at registration *</td>
</tr>
<tr>
<td>Scheduling of Final Examination</td>
<td>Student and Office of Graduate Admissions and Records</td>
<td>Not later than one week prior to Final Examination*</td>
</tr>
<tr>
<td>Final Examination</td>
<td>Master's/Ed.S. Committee</td>
<td>Not later than three weeks prior to Commencement*</td>
</tr>
<tr>
<td>Removal of Incomplete(s)</td>
<td>Instructor of course</td>
<td>Not later than one week prior to Commencement*</td>
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#### GRADUATION REQUIREMENTS FOR THESIS/PROBLEMS OPTIONS

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<td>Bursar's 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>
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<tr>
<td>Scheduling of Final Examination</td>
<td>Student and Office of Graduate Admissions and Records</td>
<td>Not later than one week prior to Final Examination*</td>
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<tr>
<td>Final Examination</td>
<td>Master's/Ed.S. Committee</td>
<td>Not later than four weeks prior to Commencement*</td>
</tr>
<tr>
<td>Approval and acceptance of final copy of thesis 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 each semester.
## Summary of Procedures for Doctoral Degrees

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

### GRADUATION REQUIREMENTS

<table>
<thead>
<tr>
<th>PROCEDURES</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>Office of Graduate Admissions and Records</td>
<td>Deadline available at registration***</td>
</tr>
<tr>
<td>Payment of graduation fee</td>
<td>Bursar's Office</td>
<td>Deadline available at registration***</td>
</tr>
<tr>
<td>Submission of dissertation to doctoral committee</td>
<td>Student</td>
<td>At least two weeks prior to Defense of Dissertation Examination</td>
</tr>
<tr>
<td>Scheduling of Defense of Dissertation Examination</td>
<td>Student and Office of Graduate Admissions and Records</td>
<td>Not later than one week prior to Defense of Dissertation Examination***</td>
</tr>
<tr>
<td>Defense of Dissertation Examination</td>
<td>Doctoral committee</td>
<td>Not later than four weeks prior to Commencement***</td>
</tr>
<tr>
<td>Approval and acceptance of final copy of dissertation, doctoral forms, and dissertation card</td>
<td>Doctoral committee and The Graduate School</td>
<td>After Defense of Dissertation Examination and not later than two weeks prior to Commencement***</td>
</tr>
<tr>
<td>Removal of Incomplete(s)</td>
<td>Instructor of course</td>
<td>Not later than one week prior to Commencement***</td>
</tr>
</tbody>
</table>

*The order of these items varies with individual programs.

**Not required in some programs.

***Deadlines are printed in the Graduate School News each semester.
Residency Classification for Tuition Purposes

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

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

A student wishing to appeal a classification should contact the Admissions Specialist, who will provide an application for reclassification and a copy of the State regulations. The application must be submitted on or before the last day of regular registration (the day before classes begin) for a given semester, if the student is to be considered for reclassification that semester.

RULES OF RESIDENCY CLASSIFICATION

Intent

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

Definitions

(1) “Public higher educational institution” shall mean a university or community college supported by appropriations made by the Legislature of the State.

(2) “Residence” shall mean continuous physical presence and maintenance of a dwelling within this State, provided that absence from the State for short periods of time shall not affect the establishment of a residence.

(3) “Domicile” shall mean a person’s true, fixed, and permanent home and place of habitation; it is the place where he intends to remain, and to which he or she expects to return when he or she leaves without intending to establish a new domicile elsewhere.

(4) “Emancipated person” shall mean a person who is no longer in the care, custody and control of his or her parent.

(5) “Parent” shall mean a person’s father or mother. If there is a non-parental guardian or legal custodian elsewhere, then “parent” shall mean such guardian or legal custodian; provided, that there are not circumstances indicating that such guardianship or custodianship was created primarily for the purpose of conferring the status of an in-state student on such unemancipated person.

(6) “Continuous enrollment” shall mean enrollment at a public higher educational institution or institutions of this State as a full-time student, as such term is defined by the governing body of said public higher educational institution or institutions, for a normal academic year or years or the appropriate portion or portions thereof since the beginning of the period for which continuous enrollment is claimed. Such person need not enroll in summer sessions or other such inter-sessions beyond the normal academic year in order that his or her enrollment be deemed “continuous.”

Enrollment shall be deemed continuous notwithstanding lapses in enrollment occasioned solely by the scheduling of the commencement and/or termination of the academic years, or appropriate portion thereof, of the public higher educational institutions in which such person enrolls.

Rules for Determination of Status

(1) Every person having his or her domicile in this State shall be classified “in-state” for fee and tuition purposes and for admission purposes.

(2) Every person not having his or her domicile in this State shall be classified “out-of-state” for said purposes.

(3) The domicile of an unemancipated person is that of his or her parent. Unemancipated students of divorced parents shall be classified “in-state” when one parent, regardless of custodial status, is domiciled in Tennessee.

Out-of-State Students Who Are Not Required to Pay Out-of-State Tuition

(1) An unemancipated, currently enrolled student shall be reclassified out-of-state should his or her parent, having theretofore been domiciled in the State, remove from the State.

(2) An unemancipated person whose parent is not domiciled in this State but is a member of the armed forces and stationed in this State or at Fort Campbell pursuant to military orders shall be classified out-of-state, but shall not be required to pay out-of-state tuition. Such a person, while in continuous attendance toward the degree for which he or she is currently enrolled, shall not be required to pay out-of-state tuition if his or her parent thereafter is transferred on military orders.

Part-time students who are not domiciled in this State but who are employed full-time in the State, or who are stationed at Fort Campbell pursuant to military orders, shall be classified out-of-state but shall not be required to pay out-of-state tuition. This shall apply to part-time students who are employed in the State by more than one employer, resulting in the equivalent of full-time employment.

(4) Military personnel and their spouses stationed in the State of Tennessee who would be classified out-of-state in accordance with other provisions of these regulations will be classified out-of-state but shall not be required to pay out-of-state tuition.

(5) The spouse of a student classified as “in-state” shall also be classified “in-state.”

Presumption

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

Evidence to be Considered for Establishment of Domicile

If a person asserts that he or she has established domicile in this State he or she has the burden of proving that he or she has done so. Such a person is entitled to provide to the higher educational institution by which he seeks to be classified or reclassified in-state or “out-of-state.” Appropriate procedures shall be established by each such institution by which a student may appeal his or her initial classification.

Effective Date for Reclassification

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

University Fees

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

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

All students must show their intent to enroll by 1) making payment, 2) payment arrangements, or 3) returning the “Confirmation” form if no fees are due. The schedule will be cancelled if one of the above is not available. This includes graduate assistants, teaching assistants, teaching associates, research assistants, staff, and others whose fees may be billed, prepaid, or waived. Late payment fees are applicable to students who register during Final Registration.

No student is authorized to attend classes who has not obtained a computerized class schedule and satisfied his/her intent to enroll.
The University is authorized by statute to withhold diplomas, grades, transcripts, and registration privileges on any students until their debts and obligations (other than Student Loan Fund notes which have not matured) owed to the University are satisfied.

The general fees for graduate students in effect at the time of publication are as follows:

**APPLICATION FEE.......................... $15**

Each graduate application for admission must be accompanied by a non-refundable fee of $15 before it will be processed (fee not required if: (1) former UT Knoxville graduate student; or (2) paid to UT Knoxville Graduate School within the previous 12 months).

If a student applies but does not enter graduate school within twelve months after date of requested admission, the file will be destroyed and it will be necessary to resubmit the $15 application fee and a new application. This fee is not refundable.

**IN-DAY FEES**

**Fall 1995**

MAINTENANCE FEE Per Semester $1,173

**OUT-OF-STATE FEES**

Fall 1995

MAINTENANCE FEE AND TUITION Per Semester $3,238

NOTE: Part-time students pay fees computed by the semester hour credit (or audit) as follows:

In-State $135 per semester hour or fraction thereof; minimum charge $135.

Out-of-State $360 per semester hour or fraction thereof; minimum charge $360.

**UNIVERSITY PROGRAMS AND SERVICES FEE**

PER SEMESTER .......................... $140

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

All students enrolled in excess of eight semester hours per term are assessed an activity fee of $140. Part-time students taking fewer than nine semester hours will be assessed at the rate of $9 per semester hour or fraction thereof; minimum charge $9.

Graduate, teaching, and research assistants, teaching associates, and fellowship students, who may have a waiver of fees (tuition and/or maintenance), must pay the appropriate University Programs and Services Fee and late payment fee, if applicable.

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

### MUSIC FEE

One half-hour lesson per week per semester ........................................ $60

One hour lesson per week per semester ........................................... $120

Payable by students receiving individual instruction in music.

### GRADUATION FEE

Master's degree candidates.............................. $30

Doctoral degree candidates.......................... $75

Doctoral hood rental (optional) ...................... $5

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

**PROFICIENCY FEES**

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

**TUITION PAYMENT PLANS**

All student fees are due in advance and should be paid in full by due date shown on VoIXpress statement.

**Prepayment Plan**

A prepayment plan has been developed to assist students and/or parents with planning and budgeting their academic year expenses. Under the plan, students and/or parents may choose the expenses they wish to prepay, including room, board, tuition, and fees. Expenses can be prepaid over a period of eight months. Students and/or parents wishing to participate in the prepayment plan should contact the Bursar's Office for details.

**Deferred Payment Plan**

Although fees, rent, and other university expenses are due and payable before the beginning of each term, students in good financial standing with a definite anticipated source of funds will be offered a deferment of up to 50% of the total charges on their VoIXpress statement. The deferred payment may be divided into two equal installments payable on approximately the 28th and 56th day of the term. All financial aid must be applied toward fees before a deferment will be considered. A deferred payment service fee of $10 is assessed when any portion of tuition, fees, and other charges are deferred with the approval of the Bursar's Office. An additional $25 late payment charge will be assessed on each monthly installment not paid on or before the due date. For more details, contact the Bursar's Office.

**Room and Board Payment Plan**

Semester room and board charges may be paid in monthly installments. The first month's rent, plus a deposit of one month's rent, is due at registration check-in. The remaining installments are due every four weeks. For more information and an application, contact the Bursar's Office.

**DEFERRED PAYMENT SERVICE FEE ... $10**

(See Tuition Payment Plans)

This fee is applicable when payment of any part of a student's account is deferred, including accounts which must be billed to outside agencies. It is the student's responsibility to pay all obligations promptly.

**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

After intent to enroll has been shown by the student, withdrawal for the semester must be by official notification to the Graduate Admissions and Records Office, 218 Student Services Building. Failure to attend class does not automatically withdraw or drop a student from college or class.

The effective date of withdrawal is the date the Office of Graduate Admissions and Records is notified by completion of the official withdrawal request form. The appropriate percentage of fees will be charged unless this action is completed by the close of the day before the first official day of classes for the semester. 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 cannot be used to withdraw from school for the semester.

For a regular academic semester, withdrawal within 5 business days beginning with the first day following registration check-in permits a 90 percent fee refund. Withdrawal between 6 and 10 business days following registration check-in permits an 80 percent fee refund. Withdrawal between 11 and 15 business days following registration check-in permits a 60 percent fee refund. Withdrawal between 16 and 20 business days following registration check-in permits a 40 percent fee refund. The above refund policy does not apply to the off-campus Graduate Centers. Refunds, in accordance with the withdrawal refund policy, will be made after the drop deadline. If financial aid has been received for the term, the refund will be applied to financial aid repayment before the student receives any refund.

Refunds

Refunds are defined as the portion of maintenance and/or tuition and University housing charges due as rebate when a student withdraws or is expelled from the University. The amount of a refund is determined by the Refund/Charge stated above.

First-time students who withdraw during the 60% point in time for which the student was charged and who received Title IV funds will have the refund calculated by the pro-rata refund policy published in the "1993-94 Federal Student Financial Aid Handbook."

Repayments

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

Refunds and repayments to the Title IV programs are determined according to the formula published in the "1993-94 Federal Student Financial Aid Handbook." The Financial Aid Office is responsible for calculating the amount of the refund/repayment and distributing the correct amount to the financial aid programs according to the Refund/Repayment Allocation Policy.

REFUND OF FEES FOR DROPPED COURSES

Part-time students pay fees computed at the appropriate semester-hour rate as indicated above. No charge is made for courses dropped during the first 8 business days following registration check-in. A 20 percent charge is made for courses dropped between 9 and 10 business days following registration check-in. A 40 percent charge is made for courses dropped between 11 and 15 business days. A 60 percent charge is made for courses dropped between 16 and 20 business days. A 100 percent charge is made for courses dropped after 20 days. Students who drop courses are eligible for a refund only if the sum of charges computed at the semester-hour rate for the hours continued, plus the percentage assessed for the hours dropped, results in an amount less than that paid. A course on a student's schedule is officially dropped, and the drop becomes effective, on the date that the change of registration form is processed on a drop/add terminal. Any refund due for dropped courses will be made after the drop deadline. Rent charges and adjustments will be determined by the Office of Residence Halls in accordance with terms of the housing agreement or contract.

SUMMER TERM FEES AND EXPENSES

Fees and expenses for the summer semester are the same as for other semesters during the academic year, except for University programs and services fees as noted above.

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

The refund policy covering withdrawals and dropped courses for the summer semester 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 registration check-in day for the course(s) involved.

WAIVER OF FEES

Graduate assistants, teaching assistants and associates, research assistants, staff, and others whose fees are receipted, prepaid, waived, or partially waived must show their intent to enroll by making payment, payment arrangements or returning the "Confirmation" portion of the VolXpress statement by the statement due date or the schedule will be cancelled. If an appointment terminates, the student owes the appropriate fees from the termination date until the end of the term. Graduate students are not eligible for UT spouse/dependent discounts.

STUDENT HEALTH INSURANCE

The University makes available, by contract with an insurance company, group health insurance expressly for students. The program is designed to supplement the care provided by the campus Student Health Service and provide basic benefits at low group premium rates. Primary emphasis is placed on hospitalization benefits, since in-patient care is not provided on campus. Students not otherwise covered are urged to take advantage of this or comparable insurance, since paying for hospital care is the student's responsibility.

Information about the insurance is mailed by the company to the student's home, and participation is solicited. Enrollment in the plan (or alternative coverage) is mandatory for international students. Students may obtain applications from the Student Health Service or the Center for International Education. Except for international students, enrollment for insurance is not part of registration for classes. NOTE: The family health insurance policy should be carefully reviewed, since most family policies do not cover a dependent child after a given age, some as early as nineteen.

IDENTIFICATION CARD

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

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

To obtain a new VolCard or replace a lost or stolen card, report to the VolCard Office, Room 337, University Center. There is a minimum charge of $10.00 for replacement of a VolCard.

FEES FOR SPONSORED INTERNATIONAL STUDENTS

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

Financial Assistance

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

ASSISTANTSHIPS

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

FELLOWSHIPS

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

ACADEMIC COMMON MARKET

The Academic Common Market is an agreement among Southern states for sharing unique programs. Participating states can make arrangements for their residents who are fully admitted to specific programs at UT Knoxville to enroll on an in-state tuition basis if these programs are not available in the state of residence.

Cooperating states in the Academic Common Market are Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Oklahoma, South Carolina, Tennessee, Texas, Virginia and West Virginia. Nineteen doctoral and thirty master's programs at UT Knoxville are approved by the Academic Common Market for residents of these states to enroll at in-state tuition rates. Students must be fully admitted to the appropriate degree program, and the letter of certification must be received in the Office of Graduate Admissions and Records no later than the first day of classes for the effective semester.

Residents of member states who seek further information should contact the Admissions Specialist in the Office of Graduate Admissions and Records, 974-3251, or the Southern Regional Educational Board, 592 Tenth Street, N.W., Atlanta, GA 30318-5790, tel. (404) 875-9211, FAX (404) 872-1477.

EMLOYMENT

Two sources of student employment are coordinated by the Financial Aid Office: (1) The Federal Work Study Program provides part-time off- and on-campus jobs for U.S. citizens or permanent residents who have demonstrated financial need by completing the Free Application for Federal Student Aid (FAFSA). A wide range of jobs are available in academic units, administrative offices, and non-profit agencies; (2) Job Location and Development, a non-need based program, lists off- and on-campus, part-time job opportunities with agencies and companies. Job interviews and minimal processing are required. Off-campus jobs are limited to U.S. citizens or permanent residents.

Students needing either part-time or summer employment are urged to contact the Financial Aid Office.

LOANS

Students must be admitted into a degree program to receive student loans.

Five types of loan programs are administered by the Financial Aid office: (1) Federal Perkins Loan, formerly National Direct Student Loan (Student Aid Report, SAR, must be on file); (2) subsidized Federal Stafford Loan, formerly Guaranteed Student Loan (SAR must be on file); (3) unsubsidized Federal Stafford Loan (SAR must be on file); (4) PLUS Loan (requires application, SAR must be on file); and (5) The University of Tennessee Loan. Processing time varies from one loan program to another. Interested students should contact the Financial Aid Office for more information.

Students must apply through the Financial Aid Office for all loan programs. Loans are limited to U.S. citizens and certain permanent residents. Additional paperwork is required on subsidized/unsubsidized Stafford and PLUS loans.

Students who have attended any post-secondary institution other than UT Knoxville must provide a Financial Aid Transcript to the Financial Aid Office even if no financial aid was received from the previous institution. All students receiving financial aid are expected to maintain financial aid progress standards to remain eligible to receive aid. In addition, all students receiving federal financial aid must have a social security number. Information on these standards, applications, and additional information are available from the Financial Aid Office, 115 Student Services Building.

VETERANS BENEFITS

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

Special Federal and State Laws and University Policies

Family Educational Rights and Privacy Act

The Family Educational Rights and Privacy Act provides for confidentiality of student records. However, it also provides for basic identification of students at UT Knoxville without the consent of the individual. Individual student records may be released to third parties only if the student has given written permission. Release of information to third parties includes directory information such as contained in the campus telephone book and sports brochures. Such information may include name, address, telephone number, date and place of birth, major, dates of attendance, degrees and awards, the most recent previous educational agency or institution attended, participation in school activities and sports, and weight and height (for special activities).

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

Use of Social Security Number

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

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

EEO/Title IX/Section 504 Statement

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

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

Inquiries concerning Title VI, Title IX, Section 504, and the ADA should be directed to the Office of Diversity Resources and Educational Services (DRES); 1818 Lake Avenue; The University of Tennessee, Knoxville; Knoxville, TN 37996-3650; or telephone (423) 974-2498 (V/TT). Charges of violation of the above policy should also be directed to DRES.

Security Information

In accordance with the Tennessee College and University Security Information Act of 1989 and the Student Right-To-Know and Campus Security Act, The University of Tennessee, Knoxville has prepared a report containing campus security policies and procedures, data on campus crimes and other related information. Copies of this report are sent to each employee and student of the University each year. Copies are also made available to each applicant for employment and admission. In addition, a free copy of this report may be obtained by any student, employee or applicant for admission or employment from the Office of the Dean of Students, 413 Student Services Building.
Drug-Free Campus and Workplace

In support of the Drug-Free Workplace Act of 1988 (Public Law 100-690) and the Drug-Free Schools and Communities Act of 1989, The University of Tennessee is notifying all students, faculty, and staff of the following University policy approved by the UT Board of Trustees on 21 June 1990.

It is the policy of The University of Tennessee to maintain a safe and healthy environment for its students and employees. Therefore, University policy prohibits the unlawful use, manufacture, possession, distribution, or dispensing of drugs ("controlled substances" as defined in the Controlled Substances Act, 21 U.S.C. 812) and alcohol on University property or during University activities.

Violation of this policy is grounds for disciplinary action--up to and including immediate discharge for an employee and permanent dismissal for a student. Federal and state laws provide additional penalties for such unlawful activities, including fines and imprisonment (21 U.S.C. § 841 et seq.; T.C.A. § 39-6-401 et seq.). Local ordinances also provide various penalties for drug and alcohol-related offenses. The University is bound to take all appropriate actions against violators, which may include referral for legal prosecution or requiring the individual to participate satisfactorily in an approved drug use/alcohol abuse assistance or rehabilitation program.

Aside from any University policy considerations, the use of illicit drugs and/or the abuse of alcohol may be harmful to your health. Some of the health risks associated with such use/abuse are described below.

- **Brain damage**--memory loss, hallucinations, psychosis
- **Cancer**--of the mouth, esophagus, stomach, liver
- **Malnutrition**
- **Ulcers and gastritis**
- **Heart disease**--enlarged heart, congestive heart failure
- **Liver disease**--cirrhosis, alcoholic hepatitis
- **Ulcers and gastritis**
- **Malnutrition**

If a pregnant mother uses drugs, her baby can be born addicted or dead.

Long-term use--organ damage, mental illness, malnutrition, death

Casual use--heart attack, stroke, brain damage, death

Needles--infection, hepatitis, AIDS, death

Individuals needing treatment information should contact their local health center or counseling center. Students needing treatment information should call their local Employee Assistance Program (800-468-8369). Students and employees may be referred to the State of Tennessee Employee Personnel Office, Employee Assistance Program, or the State of Tennessee Employee Assistance Program (800-468-8369).

**PREAMBLE**

Programs of graduate study are designed to transform the individual from student to knowledgeable practitioner or professional scholar. When a graduate assistantship is well conceived and executed, it serves as an ideal instrument to facilitate the desired transformation. The primary goal of an assistantship, then, is to facilitate progress toward the graduate degree. While the student assistant makes progress toward an advanced degree, he or she also receives work experience in a profession under the supervision of a faculty mentor.

The graduate assistant is both student and employee. As a student, the graduate assistant is expected to perform well academically to retain the assistantship. He or she is to be counseled and evaluated regularly by a faculty mentor so as to develop professional skills. As an employee, the graduate assistant is expected to meet teaching, research, and/or administrative obligations. He or she is to work under the supervision of experienced faculty and receive in-service training. In sum, the graduate assistant receives financial support for graduate study by contributing to the teaching and/or research mission of the university. The total responsibility may be greater than that required of other students or staff members, but the opportunities for professional development also are greater for the graduate assistant.

- **Tennessee Conference of Graduate Schools**

**DEFINITION**

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

**Work Assignments and Related Factors**

**Types of Assistantships**

It is imperative that each department adhere to the UTK Faculty Handbook's four categories of assistantships. All departmental guidelines should reflect the descriptions provided in the Handbook (1987, p.40).

**Graduate Teaching Assistant**

Graduate Teaching Assistants work under the direct supervision of regular faculty members and may be assigned only to duties related directly to instruction. These include such activities as assisting in the preparation of lectures, leading discussion sections, conducting laboratory exercises, grading papers and keeping class records. Assistants may not be given primary teaching and/or evaluation responsibilities nor should they be given duties to support faculty research or those basically clerical in nature.

In consultation with the supervisor, the Teaching Assistant works to gain teaching skills and an increased understanding of the discipline.

**Graduate Teaching Associate**

Graduate Teaching Associates are advanced graduate students who have been given primary responsibility for teaching graduate courses, including the assignment of final grades. No other category of graduate assistant may be so charged.

Associates may not be assigned primary responsibilities for teaching and student assessment in courses approved for graduate credit.

Associates must have met the Southern Association of Colleges and Schools (SACS) 18-hour requirement.

**Graduate Assistant**

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

**Graduate Research Assistant**

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

**Work Assignments and Related Factors**

To utilize the four categories of assistantships, the following provisions should be observed:

1. Work assignments for each type of assistantship should be as specific as possible and should be developed to reflect both the needs of the department and each graduate assistant's obligation to make satisfactory progress in his/her program. Therefore, to the
right to receive equal monthly payments for the 9 months of service and a waiver of fees for three terms (including the Summer). Students appointed to an academic year appointment beginning in the Spring term have the option of receiving 7 equal monthly payments for the January-July period or 6 equal payments for the February-July period. In both cases a fee waiver is provided for Spring and Summer terms. Graduate students on “academic year” appointments have no assistantship responsibilities in the Summer term. Students appointed to “12 month or other” appointments receive equal monthly payments for the months of the appointments and have assistantship responsibilities for the full period of the appointment. For these appointments a waiver of fees is provided only for those terms included within the appointments (i.e., a waiver of fees for the Summer term requires an appointment which encompasses the Summer term in its entirety.) In some situations, a graduate assistant may be appointed for a period shorter than a year (e.g., a semester). Graduate assistants who are performing satisfactorily are normally reappointed up to the maximum time limit as stated below. In situations where the demands of the department do not call for a job to be continued, reappointment may not be made. In cases where a department has a rotational plan for assistantships, graduate assistants likewise may not be reappointed.

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

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

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

EVALUATION/SUPERVISION OF GRADUATE ASSISTANTS

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

In cases where corrective measures must be taken to remediate deficiencies, the graduate assistant should be notified in writing of the recommended action to solve the problem(s). Situations leading to dismissal for cause must be described in writing to the assistant being dismissed. This letter should be written by the supervisor with a copy to the department head. In cases where the assistant feels that university-related factors (facilities, working conditions, improper supervision, etc.) have had negative effects on specific aspects of job performance, a letter to the supervisor would be appropriate.

The immediate supervisor for each graduate assistant is to be identified as early as possible, usually no later than four weeks prior to the commencement of the assistantship. If there will be more than one supervisor per graduate assistant, the specific tasks to be performed for each and the role each supervisor will play (e.g., which one will initiate the evaluation process) should be identified.

The chain of command within each department should be clearly indicated to graduate assistants. Thus, each graduate assistant should know that the immediate supervisor is the person to whom first contact is to be made in job-related questions/directions; followed in turn by a general departmental/school/college supervisor of graduate assistants (where one exists), the appropriate project director, department head, dean of the college, and Graduate School officials.

ORIENTATION/TRAINING OF GRADUATE TEACHING ASSISTANTS AND GRADUATE TEACHING ASSOCIATES

There must be a thorough, systematic plan of orientation and training of all Graduate Teaching Assistants and Graduate Teaching Associates. Such orientation and training may be done at either the department, college, or university level. It is the responsibility of each supervisor to see that his/her graduate assistant is provided appropriate orientation/training. There are several kinds of training that should occur beyond the initial orientation/training. Such training is usually specific to a particular job function. The Learning Research Center provides, for example, training and support services for Graduate Teaching Assistants and Graduate Teaching Associates who will be teaching at the University of Tennessee, Knoxville. Presented in several formats, this training includes attention to styles of learning and other student characteristics, communicating in the classroom, leading discussions, lecturing, directing laboratory work, using media and computers, designing syllabi, constructing and using tests, grading, evaluating courses and instructors, and similar topics. Special programs are offered for International GTAs. Evaluation and consultation services are also available through the Learning Research Center. A Handbook for New Instructors and a newsletter are made available to all GTAs. Supervisors of GTAs are responsible for notifying them about these services and about departmental and college policies on attendance at these programs and the use of these services.

ORIENTATION/TRAINING OF GRADUATE ASSISTANTS AND GRADUATE RESEARCH ASSISTANTS

Graduate Assistants and Graduate Research Assistants must also participate in a thorough, systematic orientation and training program. This training is usually at the department or college level, but the Office of Research Administration at the University level is available to assist with programs designed to help train the Graduate Research Assistant in various aspects of the job. One type of specialized training is "on-the-job." Graduate assistants who work in laboratories may receive initial orientation, followed by work experiences which constitute training. In such instances, the "on-the-job" training period should be clearly known by the student assistant.

ACCEPTING/DECLINING AN ASSISTANTSHIP

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

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

Student Services

Black Cultural Center

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

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

Career Services

Career Services, located in Dunford Hall, 974-5435, is a university-wide department providing career-related assistance to UT Knoxville students through a wide range of programs and services. Included in the services offered are a Career Carnival, an annual career fair, providing opportunities to network with representatives from 80-80 different companies about their entry level jobs and hiring practices; a Graduate School Information Day, an annual fair to which a number of graduate schools provide information for advanced study; a nonprofit career fair involving representatives from numerous area nonprofit organizations; employer information which includes types of majors sought, job descriptions, career profiles, annual reports and other pertinent information for hundreds of companies that recruit at UTK; and workshops providing instruction in skills and tactics for successful interviewing, resume preparation, business and dining etiquette, and other topics.
On-campus interviews are scheduled during the year, and require an orientation workshop for registration. The weekend of interviews are scheduled each year which include approximately 275 companies, government agencies and school systems. Two job newsletters are published biweekly, one for positions in education and one for business, industry, and government. Career Services also administers a Credentials Service for doctoral candidates. Setting up a credential file is a simple process involving the submission of a resume and academic transcript, along with letters of recommendation. An alumni placement service offers assistance in the job search after graduation. All resumes are referred directly to employers every year to assist students and recent alumni in their job-seeking activity.

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

Center for International Education

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

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

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

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

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

Child Care

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

Dining Services Facilities

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

Room and board meal arrangements offer the best combination of balanced, nutritious meals, carefully planned and served at a reasonable charge to the student. Meal plan arrangements are Seven Plus Dining (seven-day meal plan, Monday-Sunday noon), and Ten Star (10 meals per week, Monday-Sunday, with $300 per semester in a debit bonus account). For students not participating in a meal plan, meals can also be obtained from cafeterias operated on a cash basis.

The Department of Dining Services offers additional dining options. (1) The AllStar account debit plan where students make a minimum deposit of $300, receive a bonus, and can make purchases at any Dining Services location. (2) The AllStar Plus Debit Plan, requires a minimum deposit of only $10.00. There is no bonus with this plan regardless of the size of the deposit. AllStar Plus can be used at all campus dining facilities PLUS laundries, UT Bookstore, and selected vending areas as well as other participating campus locations. (3) The Dining Club account works just like a charge card. No money is deposited in advance, and no bonus is associated with this account. Food may be purchased at any Dining Services location, and monthly statements are sent to students or parents.

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

Additional information, offices are located at 405 Student Services Building, (423) 974-2577.

Disability Services

Disability Services (DS) seeks to eliminate the barriers that students with disabilities encounter and to work with them to achieve and maintain individual autonomy. The program's primary objective is to provide those students with access to the programs, social, cultural, and recreational opportunities of the University. Prospective students are encouraged to contact DS personnel so that they can be assured that the campus facilities and services are adequate to meet their needs. The staff can be of service to the students to the extent that their individual needs are made known. Contact with the students prior to registration enables DS staff to better access the needs for interpreters, readers, accessible facilities, and other support services. Van service is also provided to those individuals with mobility limitations, whether permanent or temporary. Documentation of disability from an attending physician or the Student Health Center is required.

Participation in the services program is on a voluntary basis; confidentiality is maintained. Students desiring any services are encouraged to contact the Office of Disability Services so that necessary arrangements can be made. The office is located at 414 Student Services Building.

Services related to academic programs for students with physical disabilities, whether permanent or temporary (due to illness or accident), are coordinated by the Office of the Dean of Admissions and Records, 305 Student Services Building.

Graduate Student Association

As one of the five branches of the Student Government Association, the Graduate Student Association provides a vehicle for responsible and effective student participation in the organization of graduate study at UT Knoxville. Each spring term, general campus-wide elections are conducted to elect members of the SGA. The Graduate Student Association officers and representatives are elected from the graduate programs. Offices of the GSA are located in room 941 University Center. For more information, stop by the office or call (423) 974-2577.

Hearing and Speech Services

The Hearing and Speech Center, located at the corner of Yale Avenue and Stadium Drive, offers complete diagnostic and treatment services to all University students with speech and language disorders/differences and/or hearing disorders. Services are available to any student who has paid the full University Programs and Services Fee or, if part-time, any student who has paid the optional student health service fee.

The Center serves as a clinical observation and education facility for students majoring in Speech-Language Pathology or Audiology. It also serves as a community hearing and speech center providing diagnostic and treatment
services for persons of all ages exhibiting communication disorders/differences.

**Housing**

**UNIVERSITY APARTMENTS**

The University has provided excellent apartment facilities in several locations for married students with or without families. Apartments not needed to house married students are made available to single graduate and professional students. Information and application for these facilities may be secured from the Office of Rental Properties, Stadium Hall.

**RESIDENCE HALLS**

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

A limited number of Assistant Hall Director positions are available for single graduate students. This position assists the Hall Director in coordinating and supervising all aspects of the hall operation. This is a live-in position with part-time responsibilities on a nine-and-a-half month contract. For additional information, contact the Department of Residence Halls at 974-2571.

**OFF-CAMPUS HOUSING**

A list of off-campus housing available to students is provided by the Off-Campus Housing Office, 344 University Center. The University does not inspect or approve these facilities. The terms and conditions for the rental of off-campus housing are between the student and the landlord. Students living in off-campus housing are expected to observe the same rules of conduct and standards applicable to all students.

**Minority Student Affairs**

The Office of Minority Student Affairs is designed to enhance the quality of life for minority students. Working in conjunction with other campus and community groups, the office helps identify, encourage, and assist students who have academic potential and motivation to develop their talents at UT Knoxville. Housed within the Black Cultural Center, the office furnishes information about educational, employment and financial assistance opportuni-

**Ombuds Office**

Personnel of the Ombuds Office in the University Center assist students in the resolution of problems encountered with any aspect of the University. The Ombudsperson listens to student concerns and deals with these concerns in a number of ways: explaining rules and regulations, directing students to appropriate persons, directly contacting appropriate persons, examining records, and making recommendations to appropriate officers. The office is open during the regular working day, and students are welcome to drop by, or call, at their convenience. Problems are treated confidentially and are dealt with expeditiously. The office supplemes existing appeals channels and actively seeks better ways for the University to serve students.

**Religious Resources**

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

**Student Counseling Services Center**

The Student Counseling Services Center provides services designed to help students with educational, vocational, personal, and social problems. Professional counselors work with the student in a setting that allows confidential discussion of the student's concerns. In addition, various groups are employed to meet the developmental needs of the student. These group settings provide the opportunity to share and learn from others and/or improve specific skills. Psychological tests may be used for self-evaluation. The Center also works with the faculty and student personnel to develop educational programs and projects to meet the needs of various groups at the University.

An initial session is available on a walk-in basis, daily from 10:00-11:30 and 1:00-3:30. Emergencies will be seen anytime during the regular hours of 8:00 a.m. to 5:00 p.m., Monday through Friday. The Counseling Center is located at 900 Volunteer Boulevard, 974-2196.

**Student Health Service**

Health services provided by the University are available to any student who has paid the health fee (either through paying the full University Programs and Services Fee or, if taking fewer than 9 hours, paying the optional health fee). These outpatient services are available continuously throughout every term.

The Health Service has a regular staff of primary care physicians, nurses, laboratory and x-ray technicians of Tennessee licensure. Outpatient services in the fields of family practice, internal medicine, pediatrics and psychiatry are available on a full-time basis. Appointments may be made by calling 974-3648. Specialty consultants in dermatology, surgery, sports medicine, and gynecology are available on campus through referral by a staff physician. Care beyond that provided by the regular staff can be arranged. Those students requiring allergy injections may arrange to receive them at the Clinic.

Virtually all medical services at the campus clinic except lab tests performed off campus are provided to eligible students at no additional cost.

The primary clinic at 1916 Andy Holt Avenue maintains scheduled daytime hours Monday through Friday. After-hours care (nights, weekends, and holidays) is available through the emergency room at The University of Tennessee Memorial Hospital; insurance reimbursement is accepted as payment in full for all services except outpatient care and specialty consultation. Transportation service for the campus is provided by the Campus Police or Van Pool.

All students are strongly encouraged to ensure personal immunity to measles. Immunity may be assumed if the student either: was born prior to 1957; had a confirmed case of measles; was immunized with a live vaccine after 1979; or received two measles vaccinations since the age of twelve months. The vaccine may be received at cost at the campus health clinic.

Students requiring hospitalization are generally admitted by an appropriate specialist to The University of Tennessee Memorial Hospital unless other arrangements are desired. Since inpatient care is sometimes necessary, it is important for the student to have hospitalization insurance. Student group health insurance is available and may be purchased during a designated period at the beginning of each term.

Health Service personnel will cooperate with students and family physicians in ensuring the continuity of quality health care during the university career.

**Vehicle Operation and Parking**

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

Each person who operates a motor vehicle in connection with attendance or employment at the University must register that vehicle with the Parking Services Office. There is no charge for vehicle registration; however, a parking permit is required for parking on all University lots, streets, parking structures, or leased lots with the following exceptions:
1. Staff and students with current UT Knoxville motor vehicle registration tags in their vehicles may park in any unreserved area (except those around residence halls) between the hours of 10 p.m. and 7 a.m., Monday through Friday, and 12 noon Saturday to 7 a.m. Monday.

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

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

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

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

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

Women’s Center

The Women’s Center provides essential informational and referral services to UT Knoxville students and faculty. The library's specialized collection provides books, journals, and brochures about issues and concerns of women from both a current and historical perspective. Information is available on a variety of topics including racism, violence against women, spirituality, and sex roles. The Women’s Center is located in 301 University Center. If you need more information or are interested in volunteering, please call 974-1029.
COLLEGES
The College of Agricultural Sciences and Natural Resources began in 1869 when the University was designated as Tennessee's Federal Land-Grant Institution. As such, the University was enabled for the first time to offer instruction in agriculture. Graduate instruction began as early as 1889. The College is not only an academic unit of The University of Tennessee, Knoxville campus, but is also (with the Agricultural Experiment Station, the Agricultural Extension Service and the College of Veterinary Medicine) one of the four administrative units of The University of Tennessee's Institute of Agriculture.

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

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

Graduate programs of the College of Agricultural Sciences and Natural Resources are designed to prepare men and women for positions of leadership in industry, state and federal government, teaching, research, and extension.

The graduate student is expected to demonstrate a thorough knowledge of the subject matter in his/her specialized field of study and its relationship to the sociological, economic, and environmental impact on society. The student must demonstrate the ability to plan, conduct, analyze, and report original research. Emphasis is given to intellectual growth and the development of scholarly habits of study, reasoning and analysis so that the graduate will continue to grow and develop professionally throughout his/her career.

MASTER OF SCIENCE PROGRAMS

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

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

DOCTORAL PROGRAMS

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

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

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

The four-year, preprofessional degree, where offered, is not accredited by NAAB. The preprofessional degree is useful for those wishing to build a foundation in the field of architecture, as preparation for either continued education in a professional degree program or for employment options in architecturally related areas.

The School of Planning offers a program of studies which prepares its graduates for the practice of architecture. This is accomplished through a five-year Bachelor of Architecture degree program or through the Master of Architecture degree program for students already having a baccalaureate degree.

The School of Planning offers a program of studies which prepares its graduates for professional practice in urban or regional planning. This is accomplished through a two-year master’s degree program. The School also manages the undergraduate program in Urban Studies, which awards a Bachelor of Arts degree.

The faculty and students of both units cooperate in a variety of ways, including joint field projects, guest lectures, service on thesis projects, etc. This expands the resources of talent available to students. The College also has a research and public service arm, the Center for Research, Service, and Inquiry. The offices of the dean and other College staff are located at 217B Art and Architecture Building.

College of Arts and Sciences

Lorman A. Ratner, Dean
Charles O. Jackson, Associate Dean
Lorayne W. Lester, Associate Dean
Clifton Woods, III, Associate Dean

Departments

Anthropology
Art
Audiology and Speech Pathology
Biochemistry and Cellular and Molecular Biology
Botany
Chemistry
Classics
Computer Science
Ecology and Evolutionary Biology
English
Geography
Geological Sciences
Germanic and Slavic Languages
History
Life Sciences
Mathematics
Microbiology
Music
Philosophy
Physics and Astronomy
Political Science
Psychology
Religious Studies
Romance and Asian Languages
Sociology
Speech Communication
Theatre

Facilities for Research and Service

Center for Applied and Professional Ethics
Center for Environmental Biotechnology
Center for Psychoanalysis and the Humanities
Center for Quantum Studies of the Southeastern U.S.
Center for the Study of War and Society
Child Behavior Institute
Forensic Anthropology Center
Hearing and Speech Center
Institute for Applied Microbiology
Institute for Resonance Ionization Spectroscopy
Joint Institute for Heavy Ion Research
Psychological Clinic
Science Alliance
Social Science Research Institute

The University of Tennessee began as a liberal arts institution. Before the turn of the century, less emphasis was placed on the liberal education. However, the liberal arts continued to thrive, emerging as a college in 1904. Thus, the College of Liberal Arts (now known as the College of Arts and Sciences) is one of the oldest established colleges in the University.

The College of Arts and Sciences consists of a wide array of academic disciplines and interdisciplinary programs. The central purposes of a liberal education include the encouragement of intellectual tolerance, a dedication to the quest for knowledge as a worthwhile goal in and of itself, and the cultivation of a responsible, creative individual mind. These qualities enable one to develop an ability to reason and to express oneself clearly, an incentive to absorb and transmit knowledge, and a competence to confront the uncertainties of human experience. Faculty research and creative activity is the foundation on which education in this College is built. As a result of that endeavor, the lives of students are enriched and the world’s body of knowledge grows.

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

GENERAL INFORMATION

Foreign Study Courses

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

Off-Campus Study

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

Independent Study

Certain educational goals may best be met through independent study by an individual under the direction of a faculty member. Students who wish to do such independent work should obtain the approval of the faculty members and the departments concerned prior to embarking upon their study. Credit per semester will vary from 1-15 hours. The maximum credit which may be applied toward a degree in the college is established in each individual case by the department in which the student is working.

College of Business Administration

C. Warren Neel, Dean
Michael J. Stahl, Associate Dean
Jan Williams, Interim Associate Dean
William Fox, Director, Center for Business and Economic Research
John E. Riblett, Director, Management Development Center
Scott Buechler, Director, Graduate Business Programs

Departments

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

Facilities for Research and Service

Center for Business and Economic Research
Management Development Center

The College of Business Administration was originally the School of Commerce, dating back to 1919. Commerce was changed to Business in 1937 and gained college status in 1947. The college-wide MBA program was approved in 1966 and the doctoral program in 1971.

Graduate programs of the College of Business Administration are designed to prepare men and women to assume positions in the increasingly complex world of business and industry, teaching and research, and government.

Viewing the business firm as operating in dynamic social, political, and economic environments that demand leaders capable of dealing with innovation and rapid change, the College places central importance on development of students’ thought processes and leadership potential. Emphasis is focused on flexibility of mind, receptivity to new ideas, and capacity to adapt one’s reasoning powers. Our objective is to encourage the student to develop the ability to reason analytically and logically, and to develop a commensurate plan of action. Above all else, we strive to instill the irre-
The College of Business Administration has made a commitment to total quality management by integrating the principles of productivity through quality and statistical process control throughout the graduate curriculum. Interdisciplinary partnerships are encouraged among academic units in the College, with other University academic units and with the private sector, enhancing the process of inquiry and critical thinking which is crucial to total quality management.

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

GRADUATE PROGRAMS

The College of Business Administration offers programs leading to five advanced degrees: the Doctor of Philosophy with majors in Business Administration, Economics, and Management Science; the Master of Arts with a major in Economics; the Master of Science with a major in Statistics; the Master of Accountancy; and the Master of Business Administration. The Department of Management and the Department of Psychology in the College of Liberal Arts jointly offer an interdisciplinary program in Industrial and Organizational Psychology leading to the Master of Science and Doctor of Philosophy degrees (see Industrial and Organizational Psychology). Also, the Department of Management Science coordinates an intercollegiate program leading to the Master of Science (see Management Science).

The two college-wide programs, the MBA and the Ph.D. in Business Administration, are described in Business Administration, Fields of Instruction. Descriptions of other degree programs are under the appropriate department or program headings.

FINANCIAL ASSISTANCE

A limited number of teaching and other assistantships that require from 10 to 20 hours of service per week are available through the departments of the College. Remuneration includes remission of fees and tuition as well as a monthly stipend. Awards are generally made on the basis of scholarship and performance on the appropriate (GMAT or GRE) admission test. Application forms may be obtained in any of the departments. Information on College-administered fellowships is available from the Office of Graduate Business Programs in the College of Business Administration. Applications must be received by March 1 for consideration of assistantships and fellowships to be awarded for the following fall term.

College of Education

Richard Wisniewski, Dean
C. Glennon Rowell, Associate Dean for Administration
Thomas W. George, Associate Dean for Student and Academic Services
Carol E. Kasworm, Associate Dean for Research and Technology

Units

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

Facilities for Research and Service

Bureau of Educational Research and Service
Center for Environmental/Energy/Science Education
Center for Literacy Studies
Center for Physical Activity and Health
Cognitive Enrichment Network Project
Institute for Assessment
Institute for Educational Innovation
Instructional Services Center
Project INFOE
Public Schools for Cooperative Research
Reading Center
State Testing and Evaluation Center
Tennessee Internship Consortium in Professional Psychology

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

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

Beginning in 1981, the faculty of the College of Education initiated planning new approaches to organization, new approaches to working with students, and new approaches to working with colleagues in teaching and the other professions served by the college. The purpose of the restructuring process was to enable the College to better meet the needs of students, faculty, and constituent groups in the 21st century. As a result of this process, the College, previously organized into seven departments, is now organized into eleven faculty/program units.

The College of Education holds membership in the American Association of Colleges for Teacher Education and in the Holmes Group. 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.

MASTER OF SCIENCE PROGRAMS

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

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

Degree program requirements are described
under Education, Fields of Instruction.

SPECIALIST IN EDUCATION PROGRAMS

This degree may be earned with a major in
Educational Administration and Supervision,
Educational Psychology and Guidance, and
Curriculum and Instruction.

Degree program requirements are described
under Education, Fields of Instruction.

DOCTORAL PROGRAMS

The College of Education offers programs of
advanced study leading to the Doctor of
Education in the major areas listed on the
Majors and Degree Programs chart and to the
Ph.D. with a major in Education.

Degree program requirements are described
under Education, Fields of Instruction.

TEACHER LICENSURE

Applicants for initial teacher licensure must
gain admission to the college's Teacher
Education Program. A complete explanation of
the admission process appears in the Under-
grade Catalog.

College of
Engineering

Jerry E. Stoneking, Dean
Fred Gilliam, Associate Dean, Academic Affairs
Fred D. Tompkins, Associate Dean, Administra-
tion

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

Facilities for Research and Service
Measurement and Control Engineering Center
Center of Excellence for Materials Processing
Mainteance and Reliability Center

The College had its beginnings in the
University when surveying was introduced into
the curriculum in 1836. The first two professional
degrees, Civil Engineer and Mining Engineer,
were established in 1879 at the same time that
the Board of Trustees authorized the establish-
ment of a graduate school. Known as Mechanic
Arts originally, Engineering became a college in
1904.

The purpose of the College of Engineering is
to educate men and women to the high levels of
research, technical competence, and social
understanding that will enable them to fulfill their
responsibilities as professional engineers.

Graduate programs of the College of
Engineering provide opportunities for advanced
study leading to the Master of Science and the
Doctor of Philosophy degrees. For a listing,
consult majors and degrees available on the
Majors and Degree Programs chart.

GRADUATE PROGRAM AT THE UT SPACE
INSTITUTE

At the University of Tennessee Space
Institute near Tullahoma, graduate-level courses
are offered in engineering fields such as
aerospace, chemical, electrical and computer,
engineering science and mechanics, industrial,
mechanical, metallurgical, engineering
management, and mathematics and physics. All
programs lead to the Master of Science degree.
Also, Ph.D. programs are available in many of
these fields. Information may be obtained from
the Registrar, The University of Tennessee
Space Institute, Tullahoma, TN 37388.

College of Human
Ecology

Jacquelyn O. DeJonge, Dean
James D. Moran III, Associate Dean: Graduate
Studies
Jacklin H. McNinis, Associate Dean: Academic
Administration

Departments
Child and Family Studies
Health, Leisure, and Safety Sciences
Human Resource Development
Nutrition
Textiles, Retailing and Interior Design

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

Human Ecology brings together the natural
and social sciences to enhance the well-being of
individuals and families across the life span.

The University of Tennessee was one of the
first institutions of higher education in the South
to offer home economics, with the first class
being offered in 1897. Initially called a School of
Home Economics, it combined with Agriculture
in 1947 to become the College of Agriculture and
Home Economics. In 1959, the two colleges
became separate units, although they continue
to share resources. In 1985 the name was
changed to Human Ecology, reflecting its focus
on people interacting with their environments.

Graduate study in Human Ecology prepares
the student for teaching, research, and public
service in colleges and universities or manage-
mental positions in government, business, and
industry.

The Master of Science degree is offered with
majors in Child and Family Studies, Foodservice
and Lodging Administration, Health Promotion
and Health Education, Human Ecology, Human
Resource Development, Interior Design,

College of Law

Richard S. Wirtz, Dean
Mary Jo Hoover, Associate Dean
John Sobieski, Jr., Associate Dean

The University of Tennessee College of Law
commenced operation in 1890 and has
continuously sought to provide high-quality legal
education in a university community.

While the principal objective of the college is
to prepare students for the private practice of
law, its total mission is more broadly conceived.
The college exposes students to the legal
issues of our society enabling them to develop
analytical skills with respect to decisional law
and statutes, the ability to communicate
effectively their knowledge of the law, an
awareness of the historical growth of the law, a
knowledgeable appreciation of the interrela-
tionship of law and society, and the ability to use
law as an implement of societal control and
development. Students are thus equipped to
serve their communities not only as advocates
and counselors, but as policy makers and
active, responsible citizens.

THE PROFESSIONAL PROGRAM

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

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

In combination, the direction and objectives of the college lead to the development not of a narrow technician, but of a student of the law with the perspective, breadth, and understanding necessary to accomplish the many tasks assigned by society to the legal profession.

**GRADUATE PROGRAM**

Two dual degree programs are available in conjunction with the College of Law: the J.D.-MBA program with the College of Business Administration and the J.D.-M.P.A. program with the Department of Political Science. Refer to details under the respective field of instruction. Graduate students in other disciplines may also take law courses upon approval of the College of Law and the major professor. See Law under Fields of Instruction.

**College of Veterinary Medicine**

Michael Shires, Dean
James J. Brace, Associate Dean

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

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

The primary objective of the college is to enable students to attain essential information, skills, attitudes, and behaviors to meet the varied needs of society and the veterinary profession. The professional curriculum provides an excellent basic science education in addition to training in diagnosis, disease prevention, medical treatment, and surgery. Graduates are qualified to pursue careers in many facets of veterinary medicine and related health professions.

About two-thirds of the veterinarians in the United States are engaged exclusively in pet or companion animal practice. A growing number are concerned with the health problems of zoo animals, laboratory animals, wildlife, and aquatic species. A number of veterinarians are involved in the health care of food and fiber animals ensuring the supply of safe and healthy food. Veterinarians also find rewarding careers in the U.S. Public Health Service, the Armed Forces, and in state, county, or local health agencies. A number of veterinarians are employed by the U.S. Department of Agriculture and by state departments of agriculture for important work in livestock disease control, meat and poultry inspection, serum and vaccine production, and the protection of our country against the importation of foreign animal diseases.

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

Accounting and Business Law
(College of Business Administration)

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

Keith G. Stange, Head

Professors:
Dittrich, Norman E. (Emeritus), CPA,
Ph.D. .............................................. Ohio State
Fisher, Bruce D., LL.M. .............. George Washington
Herring, Hartwell C., III, CPA, Ph.D. ... Alabama
Kiger, Jack E. (Warren L. Slagle Prof. of Acct),
CPA, Ph.D. ........................................ Missouri
Read, W. H. (Emeritus), CPA,
MBA .............................................. Northwestern
Reeve, James M., CPA,
Ph.D. ............................................. Oklahoma State
Roth, Harold P., CPA, Ph.D.………………….. VPI
Stange, Keith G. (Arthur Andersen Prof.), CPA,
Ph.D. ............................................. Louisiana State
Williams, Jan R. (Ernst & Young Prof.), CPA,
Ph.D. ............................................. Arkansas

Associate Professors:
Anderson, Kenneth E., CPA,
Ph.D. .................................................... Indiana
Massingale, Cheryl S., J.D. ..................... Tennessee
Posey, Imogene A., CPA, M.S. ............... Tennessee
Slagle, Warren L. (Emeritus), CPA,
M.S. ..................................................... Tennessee
Townsend, Richard L., CPA, Ph.D. .......... Texas

Assistant Professors:
Ayers, Susan, CPA, Ph.D. ............ Arizona State
Behn, Bruce K., CPA, Ph.D. .................... Arizona State
Carello, Joseph V., CPA, Ph.D. ....... Georgia State
Gallian, Amy W., Ph.D. ................. VPI
Hiebcoo, Kathleen B., Ph.D. ............. Oklahoma
Latsinger, M. Clyde (Emeritus), CPA,
M.S. ..................................................... Tennessee
Murphy, Daniel, CPA, Ph.D. ........... North Carolina

Distinguished Lecturer:
Wolfe, Singleton B. (Emeritus), B.S. .............. VPI

Lecturers:
Hendrick, Lee W., CPA, J.D. .............. Houston
Hughes, Harry N., B.S. ....................... Tennessee

THE MASTER OF ACCOUNTANCY PROGRAM

The objective of the M.Acc. program is to provide persons who have a high level of ability and motivation with the depth and understanding of accounting that will enhance their probability of success in a career in professional accounting. Moreover, the student’s educational experience should develop perspectives toward the discipline of accounting in a manner that will enable the student to spearhead innovation and change in response to needs in public accounting, industry, and government.

Admission Requirements

Application deadlines for international students are: Fall and Summer, January 15. Application deadlines for U.S. citizens and permanent residents are: Fall and Summer, March 1. The program is designed both for students who have completed an accredited baccalaureate degree program with a major in Accounting and the applicant’s educational experience should develop perspectives toward the discipline of accounting in a manner that will enable the student to spearhead innovation and change in response to needs in public accounting, industry, and government.

A student’s program encompasses a minimum of 30 semester hours of graduate coursework. Specifically, the student must complete courses in accounting and other areas as indicated below. Each course is 3 semester hours. The student must take at least three courses from the same concentration and one of the course numbers must end with 9. Accounting Electives: Elective courses to be taken from concentration courses listed above.

Course Requirements

A student’s program encompasses a minimum of 30 semester hours of graduate coursework. Specifically, the student must complete courses in accounting and other areas as indicated below. Each course is 3 semester hours. The student must take at least three courses from the same concentration and one of the course numbers must end with 9.

Accounting Concentration (9 hours):

<table>
<thead>
<tr>
<th>Course Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Taxation: 531, 532, 533, 534, 539.</td>
</tr>
</tbody>
</table>

Students must take at least three courses from the same concentration and one of the course numbers must end with 9. Accounting Electives: Elective courses to be taken from concentration courses listed above.

Non-accounting Electives (6 hours): Non-accounting courses taken in either other business or non-business areas, upon approval of M.Acc. advisor.

For students without an undergraduate accounting degree, the requirements are:

Prerequisites: Accounting 311, 341, 431, Management 301, 401, Finance 301, all for undergraduate credit.

Accounting Core (9 hours): 511, 513, 515, 517, 519, Business Law 511.

Accounting Concentration (9 hours):

Three concentrations are available:

<table>
<thead>
<tr>
<th>Concentration</th>
<th>Course Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial/Auditing</td>
<td>514, 518, 519, 521.</td>
</tr>
<tr>
<td>Systems</td>
<td>514, 521, 541, 542, 549.</td>
</tr>
<tr>
<td>Taxation</td>
<td>531, 532, 533, 534, 539.</td>
</tr>
</tbody>
</table>

Students must take at least three courses from the same concentration and one of the course numbers must end with 9.

Accounting Electives: Elective courses to be taken from concentration courses listed above.

For students with an undergraduate degree in accounting, there are no prerequisites for admission. However, students must take at least three courses from the same concentration and one of the course numbers must end with 9.
Required Additional Courses (12 hours):
Marketing 510, Accounting 411, 414, and 521.

Transfer Credits
A maximum of six semester hours taken at other AACSB accredited institutions that otherwise conform to the transfer policy of The Graduate School may be credited toward M.Acc. degree requirements.

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

BUSINESS ADMINISTRATION

CONCENTRATION

For complete listing of Ph.D. program requirements, see Business Administration.

Ph.D. Concentration: Accounting

This degree provides a research-oriented terminal qualification for those seeking entry-level faculty positions in accounting. Students take approximately three years of coursework beyond the bachelor’s degree, including a doctoral sequence designed to expose students to various areas of accounting research.

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

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

ACADEMIC STANDARDS

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

ACADEMIC COMMON MARKET

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

Accounting

GRADUATE COURSES

411 Financial, Compliance, and Operational Auditing
(3) Role of auditing in society from an internal and external perspective, the IIA Code of Ethics, the IIA Standards for the Professional Practice of Internal Auditing, auditing methodology, role of internal control and statistical sampling in auditing, fraud auditing, operational auditing, compliance auditing, and applications of auditing procedures to specific transaction cycles. Prereq: Principles of Managerial Accounting.

414 Financial Reporting by Business and Non-Profit Organizations
(3) Continuation of 311: liabilities, stockholders’ equity, earnings per share, corrections, aggregation issues, international accounting, and governmental statements. Prereq: Corporate Financial Reporting with a C or better.

415 Governmental and Nonprofit Accounting
(3) Study of government and not-for-profit organizations as defined by the accounting policy and standards. Financial statement analysis, regulatory requirements, and governmental statements. Prereq: Principles of Managerial Accounting or consent of instructor.

451 Operational Auditing and Consulting
(3) Approaches to evaluating entity’s efficiency and effectiveness in various settings and techniques used in consulting to provide entity competitive advantage.

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

511 Advanced Corporate Financial Reporting

513 Advanced Auditing
(3) Theory and concepts underlying internal and external auditing, fraud auditing, and other audit issues. Prereq: Auditing and Admission to M.Acc. program or consent of instructor.

514 Auditing Practice
(3) Design and performance of audits in both public and private organizations. Prereq: 513 and consent of instructor.

516 Seminar in Professional Accounting Practice
(3) Topics in financial reporting and auditing: taxation of business enterprises and emerging professional accounting standards. Prereq or coreq: 511 and admission to M.Acc. program.

519 Seminar in Accounting and Auditing Policy

521 Seminar in Advanced Managerial Cost Accounting
(3) Analysis of conceptual and current issues: impact on development of control and cost accounting. Approaches to management accounting, decision and control models, and analysis of cost control systems. Prereq: Cost and Managerial Accounting or consent of instructor.

522 Budgetary Planning and Control Systems
(3) Alternative approaches to formulation and use of planning and control systems in meet organizational objectives. Cost systems and corporate structure, discretionary expense centers, profit centers, transfer pricing, and control in manufacturing, service, and not-for-profit organizations. Prereq: Admission to a graduate business program or consent of instructor.

531 Tax Research, Methods, and Procedures
(3) Development of expertise in tax research using authoritative sources through available technologies. Advanced study of tax accounting methods, periods, procedures, and review of fundamental tax concepts to provide foundation for tax practice. Prereq: 451 and admission to M.Acc. program.

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

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

534 Family Tax Planning
(3) Review and analysis of laws pertaining to inter vivos and post-mortem property transfers and taxation of estates. Prereq: Tax Policy and Strategy: Organizational and Individual Taxation or consent of instructor.

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

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

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

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

553 Traditional Tax Planning and Strategy
(3) Review and analysis of laws pertaining to inter vivos and post-mortem property transfers and taxation of estates. Prereq: Tax Policy and Strategy: Organizational and Individual Taxation or consent of instructor.

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

600 Doctoral Research and Dissertation
(3-15) P/NP
619 Doctoral Seminar in Accounting
(3) Seminar in critical issues in accounting. Prereq: Consent of Ph.D. program advisor.

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

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

621-22 Accounting Colloquium
(1,1) Research and discussion of current issues in practice of accountancy. Prereq: Consent of Ph.D. program advisor.

Business Law

GRADUATE COURSES

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

(College of Communications)

MAJOR DEGREES

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

Ronald E. Taylor, Head

Professor:

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

Associate Professor:

Hovanland Marsh, Roxanne, Ph.D. .............. Illinois

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

Assistant Professors:

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

Raman, Niranjana, Ph.D. ................... Texas

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

GRADUATE COURSES

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

510 Advertising and Society (3) Analysis of advertising as institution in a free-enterprise democratic society and its relationship to social, legal, cultural, and economic institutions. F

520 Advertising and Communications Theory (3) Application of contemporary communications theories of attitude change, information-processing, and persuasion as applied to creative strategy decisions. Prereq: Consent of instructor or admission to program. F

530 Advertising Research (3) Nature, scope, and applications of research function to advertising decisions. Market segmentation, copy appeals, media strategy. Prereq: Statistics 201 or equivalent. Sp

540 Advertising Planning (3) Analysis of decision-making in budgeting, creative strategy, media strategy, research, evaluation, and agency-client relationships. Advertising response functions. Prereq: Consent of instructor or admission to program. Sp

597 Independent Study (3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

Aerospace Engineering

See Mechanical and Aerospace Engineering

Agricultural and Extension Education

(College of Agricultural Sciences and Natural Resources)

MAJOR DEGREE

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

Roy R. Lessly, Head

Professors:

Carter, Cecile E., Ph. D. .......... Ohio State

Dickson, Lewis H. (Emeritus), Ed.D. ...... Cornell

Lessly, Roy R. (Liaison), Ed.D. .......... Oklahoma State

Todd, John D., Ed.D. ............. Illinois

Associate Professor:

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

The Department of Agricultural and Extension Education offers a program leading to the Master of Science degree with a major in Agricultural and Extension Education. The program is designed primarily for teachers of Agricultural Education and staff employed by the Agricultural Extension Service. However, due to the flexibility of the program, it would be of value to any student interested in agriculture or adult and continuing education. The program may be completed under a thesis or non-thesis option with a concentration in either agricultural education or agricultural extension education. Candidates for the master's degree must meet the general requirements of The Graduate School and those stipulated by the department.

THE MASTER'S PROGRAM

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

1. A minimum of 30 hours of graduate credit in courses approved by the student's advisory committee. Six hours of thesis may be counted toward this requirement.
2. A minimum of 20 hours of graduate credit in courses numbered at or above the 500 level.
3. A minimum of 12 hours of graduate credit in courses appropriate to the area of concentration taught in the department and a minimum of 6 hours taught from outside the department.
4. A minimum of 3 hours of graduate credit in coursework in either research methodology or statistics.
5. A final oral examination.

Non-Thesis Option
A candidate for the master's degree who elects the non-thesis option must successfully complete:

1. A minimum of 36 hours of graduate credit in courses approved by the student's advisory committee.
2. A minimum of 24 hours of graduate credit in courses numbered at or above the 500 level.
3. A minimum of 12 hours of graduate credit in courses appropriate to the area of concentration taught in the department and a minimum of 6 hours taught from outside the department.
4. A minimum of 3 hours of graduate credit in coursework in either research methodology or statistics.
5. A creative component designed by the student and approved by the student's advisory committee for 3 hours of graduate credit.
6. A written and oral comprehensive examination.

GRADUATE COURSES

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

(College of Agricultural Sciences and Natural Resources)

MAJOR DEGREES

Agricultural Economics M.S., Ph.D.

Handy Williamson, Head

Professors:
Badenhop, M. B. (Emeritus), Ph.D. ......... Purdue
Brooker, J. R. (Liaison), Ph.D. ............. Florida
Cleland, C. L. (Emeritus), Ph.D. ............. Wisconsin
Eastwood, D. B., Ph.D. .................... Tufts
English, B. C. Ph.D. ......................... Iowa
Keller, L. H. (Emeritus), Ph.D. ............. Kentucky
Klintd, T. H., Ph.D. .......................... Kentucky
Leuthold, F. O., Ph.D. ....................... Wisconsin
Larson, J. A. (Emeritus), Ph.D. ......... Oklahoma State
McManus, B. R. (Emeritus), Ph.D. ....... Purdue
Martin, J. A. (Emeritus), Ph.D. ............. Minnesota
Mundy, S. D., Ph.D. .......................... Tennessee
 Orr, R. H., Ph.D. ............................. Illinois
Park, W. M., Ph.D. .......................... Virginia Tech
Pentecost, B. H., J.D. ......................... Tennessee
Ray, Daryl E. (Bernard Blasigame Chair of Excellence), Ph.D. ..... Iowa State
Roberts, R. K., Ph.D. .......................... Iowa State
Sappington, C. B. (Emeritus), Ph.D. ....... Illinois
Whatley, T. J. (Emeritus), Ph.D. ........... Purdue
Williamson, H., Ph.D. ....................... Missouri

Associate Professors:
Jensen, K. L., Ph.D. .......................... Oklahoma State
Pompelli, G. K., Ph.D. ........................ California (Davis)

Assistant Professors:
Jakus, Paul M., Ph.D. ........................ NC State
Leuthold, F. O., Ph.D. ....................... Washington State
Mundy, S. D., Ph.D. .......................... Tennessee
Stokes, J. R., Ph.D. .......................... Texas A&M

The Department of Agricultural Economics and Rural Sociology offers programs of graduate study leading to the Ph.D. and M.S. The doctoral program includes concentrations in agricultural marketing and price analysis, agricultural policy, farm management and production economics, natural resource economics, and rural development. The M.S. program may be completed under a thesis option with concentrations in agricultural economics or rural sociology. A non-thesis option is available with a concentration in agricultural economics only. For specific information, contact the department head.

THE MASTER'S PROGRAM

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

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

Minor
A minor will include 6 hours of coursework in the department, with at least 3 hours in 500- or 600-level courses. The student's committee must include a member of the faculty from the department who will be responsible for designating courses required for the minor.

THE DOCTORAL PROGRAM

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

Qualifying exams are required in macroeconomic and microeconomic theory. Comprehensive exams include three written exams and one oral exam. The written exams are in general agricultural economics, quantitative methods, and the area of concentration.

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

MINOR IN ENVIRONMENTAL POLICY
The department participates in a program designed to give master's level graduate students an opportunity to develop an interdisciplinary specialization in environmental policy. See Economics for program description.

Agricultural Economics

GRADUATE COURSES

412 Agricultural Finance (3) Macro-finance, financial objectives, acquisition of debt and equity funds, capital investments, capital allocation, credit analysis, borrower and lender loan application analysis, insurance strategies, computer applications, kinds and sources of agricultural credit, and financial intermediation. Prereq: Intermediate Agricultural Economics or consent of instructor. Sp

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

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

440 Agricultural Production Economics (3) Application of microeconomic theory to problems of resource allocation, enterprise selection, scale of operation for agricultural firms; economic interpretation of technical agricultural production relations. Prereq: Intermediate Agricultural Economics or consent of instructor. Sp

442 Agribusiness Management (3) Advanced decision analysis in farm and agribusiness settings, planning and organizing functions, analyzing investment alternatives, evaluating budgets and financial statements, assessing profitability and solvency, use of computers in business decisions. Prereq: Farm Business Management and Microcomputer Applications to Problem Solving or consent of instructor. F

450 Agricultural Price Analysis (3) Analysis of demand and supply mechanisms in agriculture, price determination, spatial equilibrium; temporal price patterns; pricing institutions. Prereq: Intermediate Agricultural Economics, Marketing of Agricultural Products and Statistical Methods. F

460 Rural Economic and Community Development (3) Historical and theoretical perspective on problems facing rural communities; linkages between farm and nonfarm sectors; and models and tools for analyzing rural development. Prereq: 210 or consent of instructor. F

470 Natural Resource Economics (3) Nature of natural resources; economic efficiency as a basis for natural resource use; exterminating vs. remedy factors influencing environmental quality; alternative public policy tools for influencing natural resource use or improving environmental quality. Prereq: 210 or consent of instructor. Sp

500 Thesis (3-15) P/N only. E

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

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

520 Research Methodology (1) Nature of scientific method and research processes; role of assumptions, hypotheses, theory and models; methodological problems of social sciences; establishing research priorities. Prereq: Consent of instructor. F

522 Mathematical Programming Methods in Agricultural Economics (3) Linear and integer programming techniques with empirical applications to problems of firm and region; profit maximization; cost minimization, transportation, risk, allocation over space and time. Prereq: Consent of instructor. Sp

524 Econometric Methods in Agricultural Economics (3) Application of statistical methods to agricultural economic models; estimation of supply, demand and production functions; microeconomic forecasting models; interpretation of results. Prereq: Statistics 461 or consent of instructor. F

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

540 Advanced Agricultural Production Economics (3) Theoretical and empirical concepts in agricultural resource allocation; evaluation of both static and dynamic issues; decision theory with application to agricultural firms; aggregate impact of demand decisions on industry. Prereq: 440 or equivalent. Sp

550 Advanced Agricultural Marketing (3) Analysis of structure, conduct and performance of agricultural mar-
Agricultural Engineering Technology

C. Roland Mote, Head

Professors:
Bledsoe, B. L., PE, Ph.D. .......... Oklahoma State
Henry, Z. A., PE, Ph.D. ............ NC State
Luttrell, D. H. (Emeritus), Ph.D. .... Iowa State
McDow, J. J. (Emeritus), PE, Ph.D. .... Michigan State
Mote, C. R., PE, Ph.D. ............ Ohio State
Sowell, J. I., PE, Ph.D. ............ NC State
Shelton, C. H. (Emeritus), M.S. .... VPI
Tomkins, F. D., PE, Ph.D. .......... Tennessee
Wilhelm, L. R., PE, Ph.D. .......... Tennessee
Wills, J. B., M.S. ............... Tennessee

Associate Professors:
Freeland, R. S., PE, Ph.D. .......... Tennessee
Grandle, G. F., Ph.D. ............. Purdue
Hart, W. E., Ph.D. ............... Wilkerson, J. B., Ph.D. .......... Purdue

Assistant Professors:
Baxter, D. O., M.S. ............ Missouri
Burns, R. T., Ph.D. ............ Tennessee
Busching, Michael J., Ph.D. ......... Clemson
Hubert, G. J., Ph.D. ............. Illinois
Prather, T. G., M.S. ............ Georgia
Raman, D. R., Ph.D. ............. Cornell
Womac, A. R., Ph.D. ............. Tennessee
Yoder, D. C., Ph.D. ............. Purdue
Yoder, R. E., PE, Ph.D. .......... Colorado State

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

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

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

THE MASTER’S PROGRAMS

Agricultural Engineering
Applicants who have not previously earned a degree from a professionally accredited program must submit scores from the GRE general examination. Applicants accepted into the program must complete at least 33 semester hours to earn a degree. Of these 33 hours, 20 must be in courses numbered 500 or greater (6 hours of thesis plus 14 hours of other courses). Other specific requirements for the 33 hours are:

Agricultural Engineering 504 (1), 505 (1), and other major subject courses 12 hours
Coursework in computational methods (mathematics, computer science, statistics, or any course containing appropriate computational components that may be approved by the department) 6 hours
Program electives 6 hours
Thesis 500 6 hours

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

Agricultural Engineering Technology

Thesis Option: Applicants who have not previously earned a degree from a professionally accredited program within the U.S. must submit scores from the GRE general examination. Applicants accepted into the program must complete at least 30 semester hours to earn a degree. Of these 30 hours, 20 must be in courses numbered 500 or greater (6 hours of thesis plus 14 hours of other courses). Other specific requirements for the 30 hours are:

Agricultural Engineering Technology 504 (1), 505 (1), and other major subject courses 12 hours
Coursework in computational methods (mathematics, computer science, statistics, or any course containing appropriate computational components that may be approved by the department) 6 hours
Program electives 6 hours
Thesis 500 6 hours

In addition to completing the 30 semester hours, master’s students must pass a final oral examination covering the thesis, related areas, and graduate coursework.

Non-Thesis Option: A non-thesis option in Agricultural Engineering Technology is available to qualified students. Applicants who have not previously earned a degree from a professionally accredited program within the U.S. must submit scores from the GRE general examination. Applicants accepted into the program must complete at least 33 semester hours to earn a degree. Of these 33 hours, 20 must be in courses numbered 500 or greater. Other specific requirements for the 33 hours are:

Agricultural Engineering Technology 504 (1), 505 (1), and other major subject courses 12 hours
Coursework in computational methods (mathematics, computer science, statistics, or any course containing appropriate computational components that may be approved by the department) 6 hours
Program electives 6 hours
Coursework in special emphasis area 6 hours
Capstone Experience (project and report, typically 506) 3 hours
In addition to completing the 33 semester hours, non-thesis students must pass a comprehensive written final examination covering the graduate program, including the capstone experience. At the discretion of the candidate’s committee, an oral examination may also be required.

THE DOCTORAL PROGRAM

Departmental Requirements

Students applying for admission into the doctoral program must submit evidence of ability to perform and report independent research to the satisfaction of the faculty of the department. An approved master’s thesis will usually be acceptable for this purpose. Scores on the GRE general and engineering subject examinations also are required for applicants who have not received a degree from an ABET-accredited engineering program.

To earn a degree, each doctoral student must complete at least 75 hours of approved graduate credit (beyond the baccalaureate degree) in agricultural engineering and supporting areas (engineering, computational methods, agricultural and biological sciences, and other related areas). Of the 75 hours, 48 must be in courses numbered greater than 500 (including 24 hours of course 600) and 6 hours of courses at UTK numbered greater than 600. Other specific requirements for the minimum 75 hours are:

Major subject courses 18 hours
Coursework in computational methods (mathematics, computer science, statistics, or any course containing appropriate computational components that may be approved by the department) 9 hours
Program electives 21 hours
Seminar (504, 505 or equivalent courses) 3 hours
600 Dissertation 24 hours

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

Agricultural Engineering

GRADUATE COURSES


423 Irrigation and Waste Management System Design (3) Design of irrigation and agricultural waste management systems with consideration given to livestock waste characteristics, climate, water quantity, system characteristics, and impact on crop yield and water quality. Prereq: Soil and Water Conservation and Engineering Lab. 1 hr and 2 labs. Sp.

430 Mobile Hydraulic Power System Design (3) Functional and operational characteristics of mobile hydraulic system components; pumps, valves and actuators; analysis and synthesis of power transmission and control circuits. Prereq: Fluid Mechanics or Hydraulics. 2 hrs and 1 lab. Sp/A.


451 Electronic Systems (4) Basic electronics with biological applications. Analog and digital electronics; sensing and controlling physical and environmental parameters; sensor selection and interfacing; signal conditioning; process control, laboratory experiments and design projects. Prereq: Circuit Theory, Electro Mechanical Components. 3 hrs and 1 lab. Sp.

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

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

504 Professional Development Seminar (3) Planning and executing research program; ethics and professionalism; departmental procedures and resources. (Same as Agricultural Engineering Technology 504.) S/NC only. F

505 Professional Communications Seminar (1) Reviews, reports and discussion of ideas, recent advances and current topics; presentations by students. Prereq: 504. May be repeated in doctoral program. Maximum 2 hrs. (Same as Agricultural Engineering Technology 505.) S/NC only. E

510 Similitude in Design and Research (3) Dimensional analysis; governing equations; theory of models; true, distorted, distorted models; prediction equations; interpretation of data; applications to machinery, soil and water structures, agricultural buildings and other agricultural engineering related problems. Prereq: Engineering Science and Mechanics 501, 541, 2 hrs and 1 lab. Sp/A.

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

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

541 Principles of Compost Engineering (3) Comprehensive study of composting: survey of installed systems; thermodynamics of composting; biology of heat inactivation; feed conditioning; aerodynamic characteristics, process kinetics; and odor control. Design component. Prereq: Thermodynamics, heat and mass transfer. F.

542 Simulation of Agricultural Systems (3) Synthesis and analysis of agricultural systems using computer simulation, philosophy of system simulation, critical path, discrete and continuous systems. Prereq: 505 and scientific computer programming. 2 hrs and 1 lab. F/A.

543 Instrumentation and Measurement (3) Modern instrumentation techniques. Static and dynamic response of instrumentation; test instrumentation; temperature, moisture, optical radiation, displacement, strain, pressure, velocity, acceleration, and flow measurements; data acquisition and control. Prereq: 451 or Electronics and Computer Circuits or Equivalent. 2 hrs and 1 lab. (Same as Environmental Engineering 543.) F/A.

545 Monitoring Hydrologic Phenomena (3) Application of instrumentation theory to monitoring hydrologic phenomena; strengths and weaknesses of current equipment and strategies; operation and solution of environmental monitoring problems. Prereq: 543. 2 hrs and 1 lab. (Same as Environmental Engineering 545). Sp/A.

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

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

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

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

620 Computer Simulation of Agricultural Systems (3) Scientific approach to digital simulation; system definitions and boundaries, formulation of models, algorithms and solution techniques, encoding of prediction equations and models, algorithms and solution techniques, encoding of prediction equations and models; output verification and calibration of simulation model results. Prereq: Basic Engineering 101, 201 or equivalent. 2 hrs and 1 lab. F/A.

630 Feedback and Control Systems (3) Differential equations for physical systems: solutions, transforms, and system response. Types of control, frequency response, system compensation, and system analysis. Application to agricultural systems. Prereq: 451, Mathematics 231, Basic Engineering 101, 201, or equivalent. 2 hrs and 1 lab. F/A.

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

Agricultural Engineering Technology

GRADUATE COURSES

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

432 Agricultural Machinery and Tractors (3) Agricultural machinery and power equipment related to agricultural practices; management considerations, field efficiencies; capabilities; adjustment and servicing. Prereq: Calculus 2, 2 hrs and 1 lab. F.

442 Agricultural Waste Management and Pollution Control (3) Waste renovation fundamentals; characteristics of animal manure; techniques for collection, transportation, storing, and utilizing livestock waste. Prereq: Mathematics 121, 2 hrs and 1 lab. Sp.

452 Small Internal Combustion Engines (3) Theory, concepts, and mechanics of small internal combustion engines; theoretical cycles, selection, operation, adjustment, troubleshooting and repair of single-cylinder engines. Prereq: Introductory Physics or consent of instructor. 2 hrs and 1 lab. Sp.

453 Irrigation and Waste Management System Design (3) Design of irrigation and agricultural waste management systems with consideration given to livestock waste characteristics, climate, water quantity, system characteristics, and impact on crop yield and water quality. Prereq: Soil and Water Conservation and Engineering Lab. 1 hr and 2 labs. Sp.

462 Agricultural Chemical Application Technology (3) Equipment for application of liquid, solid, and gaseous agricultural chemicals; system components; operational characteristics; calibration; selection and management; safety considerations; materials handling and disposal methods. Prereq: Physics 121 or consent of instructor. 2 hrs and 1 lab. Sp.

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

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

504 Professional Development Seminar (1) (Same as Agricultural Engineering 504.) S/NC only.

505 Professional Communications Seminar (1) (Same as Agricultural Engineering 505.) S/NC only.

506 Physical Phenomena (3) Properties of materials, fundamentals of hydraulics, principles of electricity, thermal phenomena, applications in biological systems. Prereq: Consent of instructor. F.

508 Special Problems in Agricultural Engineering Technology (1-3) Individual studies of current problems. May be repeated. Maximum 6 hrs. E

522 Processing and Environmental Systems (3) Environmental systems in plant, animal and food production; application of electric power, mechanical equipment, structures, crop processing and materials handling. Prereq: 506. 2 hrs and 1 lab. Sp/A.

532 On-Site Domestic Water Supply and Wastewater Renovation (3) Biological processing, selection and design of pumps and delivery systems, and point-of-use water treatment processes; soil-based wastewater renovation principles, and design and operating criteria for on-site wastewater renovation systems. Prereq: 506. 2 hrs and 1 lab. Sp/A.

542 Simulation of Agricultural Systems (3) Synthesis and analysis of agricultural systems using computer simulation, philosophy of system simulation, critical path, discrete and continuous systems. Prereq: 506 and scientific computer programming. 2 hrs and 1 lab. F/A.
Agriculture

(College of Agricultural Sciences and Natural Resources)

GRADUATE COURSES

512 Teaching Internship in Agriculture (1) Supervised experience in teaching; test preparation and evaluation of agriculture students. May be repeated. Maximum 2 hrs for M.S. students; 4 hrs for Ph.D. students.

Animal Science

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

MAJOR DEGREES

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

Kelly Robbins, Head

Professors:

Barth, K. M. (Emeritus), Ph.D. ................. Rutgers
Bell, M. C. (Emeritus), Ph.D., .... Oklahoma State
Bletner, J. K. (Emeritus), Ph.D. ................ Ohio State
Chamberlain, C. C. (Emeritus), Ph.D. .... Iowa State
Erickson, B. H. (Emeritus), Ph.D. .............. Kansas State
Godkin, J. D. (Liaison), Ph.D. .................. Massachusetts
Hall, O. G., Ph.D. ................................ Iowa State
Hansard, S. L. (Emeritus), Ph.D. .............. Florida
Henry, R. W., D.V.M., Ph.D. ................. Ohio
Livdahl, E. R. (Emeritus), M.S. ............... Tennessee
McDonald, T. P., Ph.D. ......................... Pennsylvania
McLaren, R. L. (Emeritus), Ph.D. .............. Wisconsin
Oliver, S. P., Ph.D. ................................ Ohio State
Richardson, D. O., Ph.D. ....................... Ohio State
Robbins, K. R., Ph.D. ............................. Illinois
Saxton, A., Ph.D. .................................. North Carolina
Shirley, H. V. (Emeritus), Ph.D. .............. Illinois
Schultz, T. W., Ph.D. ............................... Pennsylvania
Sims, M. H., Ph.D. ................................. Aubum
Tugwell, R. L. (Emeritus), Ph.D. .............. Kansas State

Associate Professors:

Backus, W. R., Ph.D. ............................... Tennessee
Bell, R. B., Ph.D. .................................. NC State
Eller, H., D.V.M., Ph.D. ........................... Illinois
Heitmann, R. N., Ph.D. ................. Maine
Kattesh, H. G., Ph.D. ............................. UPI
Masincup, F. B., Ph.D. ............................. Kansas State
Quigley, J. D., Ph.D. ................................. Virginia Tech
Smith, M. O., Ph.D. ................................. Oklahoma State
Wall, J., Ph.D. ................................. Nebraska

Assistant Professors:

Grizzle, J. M., Ph.D. .............................. Florida
Hollingsworth-Jenkins, K., Ph.D. .......... Nebraska
Mathew, A. G., Ph.D. ............................... Purdue

Assistant Professors:

Mendis-Handagama, L. C., D.V.M., Ph.D. ....... Monash
Schrick, F. N., Ph.D. .......................... Clemson
Smalling, D. J., Ph.D. ............... Texas A&M

THE DOCTORAL PROGRAM

The doctoral program requires a minimum of 48 semester hours of coursework beyond the B.S. and a minimum of 24 hours of doctoral research and dissertation. The 48 hours of coursework must include:

1. A minimum of 16 hours in related fields outside of animal science.
2. At least 24 hours credit at the 500 and 600 level, exclusive of doctoral research and dissertation, of which a minimum of 6 hours must be at the 600 level. Students in the nutrition, breeding, physiology, or anatomy concentration must complete at least 12 hours at the 500 and 600 level in the respective concentration or closely related area.
3. A minimum of 1 hour of Agriculture 512 in addition to that required at the M.S. level.
4. A minimum of 6 hours in 400-, 500-, or 600-level statistics courses approved for the ICGSP.

A minimum of five faculty members will constitute the student's advisory committee, of which at least one must be outside Animal Science. The major professor must be the chairperson. The student and the major professor select a program of study depending on the student's area of concentration and professional goal. The advisory committee approves the coursework and the dissertation research proposal and determines if there is to be a foreign language requirement. The advisory committee conducts the comprehensive written and oral examination and the final dissertation defense examination.

GRADUATE COURSES

420 Advanced Reproduction (3) Collection, evaluation, and preservation of ova, spermatozoa and embryos; application of methods of natural breeding and techniques of artificial insemination and embryo transfer; herd sire and dam evaluation; pregnancy determination; gestation and parturition; infertility; recent advances in thymology. Prereq: 320 or equivalent. 1 hr and 2 labs. F

430 Advanced Ration Formulation (2) Advanced ration formulation for beef and dairy cattle, sheep, horses, swine, poultry, laboratory, zoo, and companion animals. Mathematical and computer solutions and applications to formulating complex rations with constraints. Prereq: 330 or equivalent and introductory computer science course. 2 labs. Sp

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

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

482 Dairy Cattle Production and Management (3) Integration of principles of nutrition, breeding, physiology, and marketing into complete production and management programs. Structure of industry, enterprise establishment, systems of production, profit production, and improvement programs. Management evaluated in terms of production responses and economic
returns. Prereq: Completion of 300-level core courses or equivalent or consent of instructor. 2 hrs and 1 lab. F

483 Pork Production and Management (3) Integration of principles of nutrition, breeding, physiology, and marketing into complete production and management programs. Structure of industry, enterprise establishment, systems of production, production practices, and improvement programs. Management evaluated in terms of production, economic returns. Prereq: Completion of 300-level core courses or equivalent or consent of instructor. 2 hrs and 1 lab. Sp

484 Poultry Production and Management (3) Integration of principles of nutrition, breeding, physiology, and marketing into complete production and management programs. Structure of industry, enterprise establishment, systems of production, production practices, and improvement programs. Management evaluated in terms of production, economic returns. Prereq: Completion of 300-level core courses or equivalent or consent of instructor. 2 hrs and 1 lab. F

486 Lamb and Wool Production and Management (3) Integration of principles of nutrition, breeding, physiology, and marketing into complete lamb and wool production and management programs. Structure of industry, enterprise establishment, systems of production, production practices, and improvement programs. Management evaluated in terms of production, economic returns. Prereq: Completion of 300-level core courses or equivalent or consent of instructor. 2 hrs and 1 lab. Sp

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

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

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

526 Animal Physiology (4) Major body systems and interrelationships: nervous, muscle, blood, cardiovascular, kidney, respiratory, gastrointestinal, and endocrine. Concepts of metabolism, temperature regulation, and acid-base balance. Prereq: Animal Science sophomore and junior core courses or consent of instructor. 2 hrs and 1 lab. Sp

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

530 Animal Nutrition and Metabolism (4) Comparative digestive physiology, digestion, absorption and metabolism of nutrients in ruminant and nonruminant species. Concepts and methodologies of animal growth and nutrient requirements, interaction of feedstuffs, availability and deficiencies of nutrients. Prereq: Animal Nutrition, Feeds, and Ration Formulation or consent of instructor. F

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

538 Nutritional Aspects of Companion Animal Health (2) Nutritional concepts applied to veterinary management of normal and overweight pets including dogs, cats, horses and exotic species. (Same as Comparative and Experimental Medicine—Veterinary Medicine 538.) Sp

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

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

554 Comparative Hematology (3) Morphology, physiology and development of blood and blood forming organs: similarities and differences of major domestic species; systemic and localized diseases. Prereq: Consent of instructor. 2 hrs and 1 lab. (Same as Comparative and Experimental Medicine—Veterinary Medicine 554.) Sp

571 Design and Analysis of Biological Research (3) Experimental design and procedures; selection of experimental units; analysis and interpretation of data; statistical models and contrasts, analyses of variance; covariances; treatment arrangements, mean separation and regression. Prereq: Plant and Soil Science 471 or equivalent; knowledge of software package on micro- or mainframe computer. (Same as Plant and Soil Science 571.) Sp

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

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

595 Colloquium in Animal Science (1) Orientation; teaching, research and extension programs. Guidance in preparation of student's course of study and research plans. Required of beginning graduate students in animal science program. S/NC only. F

596 Seminar (1) Advanced topics in animal science. Required of all first- and second-year graduate students. May be repeated. Maximum 4 hrs. S/NC only. F, Sp

600 Doctoral Research and Dissertation (1-15) Prereq: E

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

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

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

651 Advanced Topics in Animal Anatomy (1-4) Current and future research methodology, laboratory situation, recent advances in quantitative techniques for gross and microscopic anatomy. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. F (Same as Comparative and Experimental Medicine—Veterinary Medicine 651.) E

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

Animal Science—Veterinary Medicine

See College of Veterinary Medicine and Comparative and Experimental Medicine

Anthropology (College of Arts and Sciences)

MAJOR

DEGREES

Anthropology .................. M.A., Ph.D.

Jan F. Simék, Head

Professors:

Bass, William M. (Emeritus), Ph.D. Pennsylvania
Faulkner, Charles H., Ph.D. Indiana
Jantz, Richard L., Ph.D. Kansas
Klipfel, Walter E., Ph.D. Missouri
Parmalee, Paul W. (Emeritus).

Ph.D. Texas A&M

Simék, Jan F., Ph.D. SUNY Binghamton
Wheeler, Margaret G. (Emeritus), Ph.D. Yale

Associate Professors:

Harrison, Faye V., Ph.D. Stanford
Harrison, Ira E., Ph.D. Syracuse
Howell, Bonita J., Ph.D. Kentucky
Konigsberg, Lyle, Ph.D. Northwestern
Logan, Michael H., Ph.D. Penn State
Schoedel, Gerald F., Ph.D. Washington State

Assistant Professors:

Kramer, Andrew (Liaison), Ph.D. Michigan
Marks, Murray K., Ph.D. Tennessee

Research Associate Professor:

Chapman, Jefferson, Ph.D. North Carolina

The Department of Anthropology offers both the M.A. and Ph.D. degrees with concentrations in archaeology, biological anthropology, cultural anthropology, and zooarchaeology. Additional information on the Anthropology graduate program may be obtained from the departmental brochure or by contacting the Anthropology Department.

THE MASTER'S PROGRAM

Students wishing to enter the Master of Arts degree program with a major in Anthropology should have an undergraduate GPA of 3.5 in the major, 3.3 overall, and hold a bachelor's degree from an accredited university with a major in Anthropology. Applicants with a major in a related field (biology, sociology, geology, classics or geography) will be considered only if they have a formal minor in anthropology or its equivalent (at least five upper division anthropology courses).

All prospective M.A. students must make formal application to The University of Tennessee, Knoxville Graduate School. Copies of the application form, transcripts, and GRE scores that are sent to The Graduate School should also be sent directly to the Department of Anthropology at the same time. In addition, the department requires a letter of intent from the applicant indicating career goals and reasons for selecting the University of Tennessee, three letters of recommendation, and a sample of the student's written work (a class paper or research report); these materials should be sent directly to the Graduate Secretary, Department of Anthropology, SSH 250, University of Tennessee, Knoxville, TN 37996-0720.
Graduate applications are considered once a year by the Graduate Committee. All application materials must be received in the department by January 15 for admission the following Fall. Because of the structure of first-year studies, M.A. students should plan to begin their studies in the Fall semester.

M.A. Requirements

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

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

2. A minimum of 30 credit hours in graduate courses. Twenty-four hours must be in coursework graded A-F. Coursework must include three core courses taken in the first year:
   a. 510 Method and Theory in Cultural Anthropology
   b. 560 Theory in Archaeology
   c. 590 Method and Theory in Biological Anthropology

   Additional coursework should be selected in consultation with the student’s advisor and must include one additional course from two anthropology concentrations besides the student’s primary concentration. At least 20 hours of coursework must be at the 500 level or higher.

3. During the first year, comprehensive Graduate Evaluation Examinations (GEEs) are required of all M.A. students and are based on the content of the core courses. These examinations are given as the final examination in each core class (during regularly-scheduled final periods) and are graded by all faculty within the appropriate subdiscipline for each course. At the end of the first year, all M.A. students will be evaluated by the entire faculty and will either be retained or dropped from the program based on their first-year’s performance and GEE scores.

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

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

6. In the second year of the program, students pursue their concentration area and undertake thesis research. Coursework will be determined through consultation with the student’s advisor and committee (composed of the advisor and at least one other member of the Anthropology faculty along with other mutually-agreed-upon members).

7. Successful completion of the thesis and final oral examination. Normally, students will complete and defend their theses during the Spring semester of their second year.

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

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

THE DOCTORAL PROGRAM

In addition to the Graduate School requirements, requirements for the Ph.D. degree with a major in Anthropology, in the appropriate sequence of completion, are as follows:

Admission: Admission to the Ph.D. program is contingent upon completion of ALL requirements prior to that level. Master’s thesis candidates at UTK who are conditionally accepted into the Ph.D. program can enroll as doctoral students the semester following conferment of the M.A. degree. Students holding Master’s degrees from other institutions must apply by January 15 for admission the following Fall and must begin their studies in the Fall semester.

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

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

1. Acceptance of a Master's degree in anthropology;
or

2. Acceptance of a Master's degree in another discipline, with the provision that the student will follow the first-year program with entering M.A. students, i.e., complete the core courses (510, 560, 590) and pass the Graduate Evaluation Examinations.

Doctoral Committee: A doctoral committee is appointed following admission to the program. In consultation with this committee, the student defines the future program of study. When the student and committee have agreed upon the specific fields of specialized competence over which the student will be examined, a brief delineation of the fields of study is prepared, submitted to the department head and the student’s major professor. As early as possible, but no later than a full semester after admission to candidacy, the student shall formally present a written dissertation proposal to the department head and advisor.

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

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

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

1. Successful performance on a language examination administered by the appropriate language department. A student electing this alternative should consult with the advisor; or

2. Completion of the second semester of specialized reading courses for graduate students with a grade of B or better.

The department does not accept completion of the intermediate (200 level) sequence of a language as a formal option for fulfilling the language requirement.

Doctoral Comprehensive Examination: Students must successfully complete a written and oral comprehensive exam.

1. Comprehensive Written Examination: When the Ph.D. aspirant has completed all of the foregoing requirements and is judged by the committee to be prepared in the field(s) of concentration, the student will be required to take a comprehensive written examination. The exam will consist of three sections and be given by the student’s committee. All three sections must be taken within seven consecutive days.

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

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

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

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

ACADEMIC COMMON MARKET

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

410 Principles of Cultural Anthropology (3) Exploration and illustration of major concepts, theories, and methods in cultural anthropology, with application to analysis of specific ethnographic materials. Prereq: 130.

411 Linguistic Anthropology (3) Basic linguistic concepts applied to research in cultural anthropology; investigation of relationships between language and culture. Prereq: 190 or Linguistics 200. (Same as Linguistics 411.)

412 Folklore in Anthropology (3) Introduction to anthropological study of folklore, using folklore and folklife materials from various tribal, peasant, and complex societies. Prereq: 130 or consent of instructor.

413 Dynamics of Culture (3) Major forms of culture change, ranging from evolution and diffusion to religious revitalization and political revolt. Continuity and change in diverse cultural settings through use of archaeological, ethnographic, and contemporary cases. Prereq: 130.

414 Political Anthropology (3) Organization and dynamics of power and politics in both stateless and state-level societies. Role of symbols, rituals, and ideologies in producing and reproducing power relations. Relationship between decision-making (individuals and structures). Encapsulation of traditional political forms and systems within modern states. Prereq: Cultural anthropology or consent of instructor.

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

435 Historical Archaeology Laboratory (3) Laboratory procedures for processing, identification, and interpretation of archaeological and quaternary sites. Artifacts, data, and structural materials from historic East Tennessee sites used for class projects. Recommended prereq: Prehistory. Anthropology.

440 Cultural Ecology (3) Concepts and methods in studying dynamic interaction between prehistoric and present-day cultures and their environments: ecological theory, methods of analysis, and review of selected case studies. Prereq: 120, 130, 410, or consent of instructor.

451 African Prehistory (3) African cultural history from earliest evidence of human activity to time of European contact. Stone age of African south of Sahara. Prereq: 120 or consent of instructor. (Same as Afro-American Studies 461.)

462 Early European Prehistory (3) Origins and evolution of human culture in Europe through the beginning of the Neolithic and Mesolithic chronology and lifeways. Prereq: 120 or consent of instructor.

483 Rise of Complex Civilizations (3) Development and rise of complex societies in Old World from origins of agriculture to rise of States. Mesopotamia, Neolithic, and Metal Age lifeways in Africa, Asia, and Europe. Prereq: 120 or consent of instructor.

484 Principles of Zoarchaeology (3) Basic osteological studies of major vertebrate groups; biological-physical use of animals in subsistence and culture. Identification and interpretation of archaeologically derived molluscan and vertebrate faunas; introduction to laboratory use of comparative collections. Prereq: 120 or consent of instructor.

465 Urban Archaeology (3) Field archaeology and interpretation of archaeological remains on historic urban sites in the U.S. Lectures and field laboratory research on urban sites in East Tennessee. Recommended prereq: Prehistory. Anthropology.

480 Human Osteology (4) Intensive examination of human skeletal remains. Prereq: 110 and consent of instructor. 3 hrs and 1 lab.

481 Museology I: Museums, Purpose and Function (3) (Same as Art 462.)

482 Museology II: Exhibition Planning and Installation (3) (Same as Art 463.)

484 Museology III: Field Projects (1-12) (Same as Art 464.)


494 Primate Behavior (3) Social organization and behavior of selected primates: group composition, size, and structure; patterns of mating; other social interactions; communication; and cultural behavior. Application of primate studies to human ethology. Prereq: 110 or consent of instructor.


499 Human Response to Environmental Stress (3) Physiological perception of stress from psychosocial and physiological, and anatomical and behavioral responses to stress. Prereq: 110-115. P/NP only, E.

501 Graduate Research (1-9) Independent investigation of special problems in anthropology. May be repeated. Maximum 18 hrs.

502 Registration for Use of Facilities (3-15) Required of advanced graduate students. May be repeated. Maximum 18 hrs.

504 Fieldwork in Anthropology (3-9) Practicum in archaeological cultures in Europe through beginning of the Paleolithic and Mesolithic. Methods of analysis and interpretation. Prereq: Consent of instructor.

531 Quantitative Methods in Archaeology (3) Application of quantitative techniques to archaeological data critically examined through literature and problem solving sessions and advanced statistical analyses and other mathematical methods. Prereq: Consent of instructor.

560 Theory in Archaeology (3) Detailed consideration of theory in contemporary archaeology: models of scientific explanation, research design, archaeological formation processes, and methods of analysis and interpretation.

561 Archaeological Resource Management (3) Federal legislation and regulations affecting identification, protection, and management of archaeological resources. Techniques of structural and architectural analysis; sensitivity issues; procedures for the student not otherwise registered during any term. May be repeated. Maximum 6 hrs.

562 Problems in Old World Archaeology (3) (Same as Classics 562.)

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

564 Anthropology of South America (3) Anthropological research on prehistoric La Plata cultures in Southeastern United States. Prereq: Consent of instructor.

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


583 Skeletal Biology (3) Practical and theoretical approaches to analysis of prehistoric human skeletal remains. Demography, vital statistics, pathology, nutrition, and measures of biological relationships as related to population as adaptive units. Prereq: 480.

585 Anthropometry (3) Techniques of measuring and describing skeletal material and human subjects: practical applications to growth, nutrition, and human engineering. Prereq: Consent of instructor.

587 Laboratory in Forensic Anthropology (3) Discussion of lab experience with forensic anthropological techniques: radiographic analysis, dental examination, hair analysis, bone microstructure. Prereq: Human Origins, 480, 581 or consent of instructor. 2 hrs and 1 lab.

589 Anthropological Genetics (3) Application of population and quantitative genetic theory to study of human and nonhuman primate populations. Prereq: Consent of instructor.

590 Method and Theory in Biological Anthropology (3) Current methods of analysis in biological anthropology as based on current and future advances of theoretical perspectives. Paleoanthropology, human osteology, and human variation and population structure. Prereq: Consent of instructor.

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

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

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

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

601 Advanced Graduate Research (1-15) Independent investigation of special problems in anthropology by advanced graduate students. May be repeated. Maximum 12 hrs. Only 3 hrs may count toward 600-level requirement.
610 Seminar in Cultural Anthropology (3) Selected topics, primarily for doctoral students in cultural anthropology. May be repeated. Maximum 12 hrs.

611 Theory in Cultural Anthropology (3) Critical evaluation of current issues in theory and data interpretation, primarily for doctoral students in cultural anthropology.

660 Advanced Seminar in Archaeology (3) Selected topics in prehistoric and historic archaeology. May be repeated. Maximum 12 hrs.

690 Selected Topics in Physical Anthropology (3) For doctoral students in biological anthropology. May be repeated. Maximum 6 hrs.

691 Selected Topics in Paleoanthropology (3) May be repeated. Maximum 6 hrs.

695 Gross Human Anatomy (9) Skeleton, muscles, and cardiovascular system. Dissection of cadavers. Prereq: 480 or Human Biology. 9 hrs and 5 labs.

Architecture

College of Architecture and Planning

MAJOR

DEGREE

Architecture...........................................M. Arch.

Marleen K. Davis, Dean
William J. Lauer, Associate Dean
Jon P. Coddington, Graduate Program Head

Professors:

Anderson, G. I., M. Arch..........................Illinois
Conley, G. (Emeritus), B. Arch.....................Harvard
Davis, Marleen, M. Arch..............................Harvard
Grieger, F., M. Arch.................................Pennsylvania
Kelso, R. M., M.S.................................Tennessee
Kersavage, J. A., D. Sc..............................Southern Cal
Kim, S. A., Ph. D.................................SUNY (Buffalo)
Lauer, W. J. (Liaison), M. S. Arch.Engr..............Iowa State
Lesser, A. J., M. Arch...............................Virginia
Lizon, P., Ph. D......................................Pennsylvania
Moffett, M. S., Ph. D.................................MIT
Reburn, J. S., M.A.................................Texas
Robinson, M. A., M. Arch..............................Pennsylvania
Rudd, J. W., M. A.....................................Northwestern
Shell, W. S., M. S. Arch..............................Columbia
Watson, J. S., M. Arch.................................Pennsylvania
Wodehouse, I. M. (On leave), Ph. D.....................St. Andrews

Associate Professors:

Coddington, J. M., M. Arch..........................Pennsylvania
Davis, T. K., M. Arch................................Cornell
Kaplan, M., M. Arch................................Harvard
Martella, W. E., B. Arch..............................California
Schimmelfennig, M. M., M. Arch....................Florida
vonBeauvoir, P. M., S..............................Texas

Assistant Professors:

Almy, D. J., III, M. Arch............................Texas
Fox, L. D., M. Arch................................Cranbrook
French, R. C., B. Arch................................Cranbrook
Livingston, M., M. A.F.A..............................Michigan
Moier-McClellan, T. W., M. Arch......................Michigan
Ware, S. M., M. F. A.................................Pennsylvania

MASTER OF ARCHITECTURE PROGRAM

The School of Architecture offers two tracks leading to the Master of Architecture degree. Track 1 is for students seeking the first-professional degree who already hold a Bachelor's degree or an advanced degree in another field. Track 2 is for students with an accredited first-professional degree who seek to develop an area of specialization.

Admission Requirements

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

For Track 1 applicants, a bachelor's degree with a 3.0 GPA from a regionally accredited college or university is required. International applicants must have an equivalent 4-year degree and a 3.0 GPA. Candidates with a GPA less than 3.0 may be considered for conditional admission when evidence of exceptional promise is identified. Undergraduate work must include at least twelve semester hours of humanities, a basic understanding of physical principles, systems and analytical procedures, and an understanding of mathematical principles and analytical procedures as well as a general understanding of the use of computers. The School requires a separate application for Architecture including an essay and three letters of recommendation. A personal on-site interview is desirable but not mandatory. For those applicants from accredited 4+2 architecture programs, a portfolio is required in addition to the above requirements.

For Track 2 applicants, a Bachelor of Architecture degree from an NAAB accredited program, or foreign equivalent. Candidates with a GPA less than 3.0 may be considered for conditional admission when evidence of exceptional promise is identified. Submission of a portfolio with a separate application to Architecture to include an essay and three letters of recommendation are also required. A personal on-site interview is desirable but not mandatory.

The general portion of the Graduate Record Examination is required of all applicants. Applicants should take the GRE at least one semester in advance of application for admission.

Degree Requirements

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

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

Both tracks require 6 hours of Thesis 500 with a public presentation and oral defense of the thesis. Retention in the program is contingent upon evidence of satisfactory progress toward the degree. Each student's progress will be reviewed each semester by the Graduate Program Head. Any questions regarding progress will be reviewed by the Graduate Program Advisory Committee.

For further information, contact the School of Architecture.

ACADEMIC COMMON MARKET

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

GRADUATE COURSES

403 Introduction to Preservation (3) History, theory, and legal aspects of architectural preservation and restoration.

404 Preservation Technology (3) Techniques of preservation: methods of analysis, history of materials and technology used in old buildings. Prereq: 403.


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

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

412 Non-Western & Indigenous Architecture (3) Buildings responsive to climate, material availability, and economic conditions, as designed by anonymous builders. Prehistoric times to present throughout the world. Prehistoric cultures, Indus Valley, Hindu, Buddhist, and Mughal architecture of India, China, and Japan.

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

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

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


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


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

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

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

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

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

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

434 Building Energy Analysis (3) Balancing heat flow through external skin of residential and small and large commercial buildings. Local climate evaluation, site planning, building size and orientation, window area, wall treatment, infiltration control, and other design elements.
Energy use quantification methods and economic analysis of energy efficient design features. Architectural program analysis of exterior and internal load-bearing buildings. Prereq: 341.

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

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

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

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

466 Marketing Services (3) Theories of marketing for architectural practice. Case studies. Public relations procedures.

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

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

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

504 Issues in Preservation (3) Architectural issues: preservation, restoration and conservation of historic structures. Prereq: Consent of instructor.

510 Issues in Urban Design (3) Investigations of urban forms, patterns and attitudes that have shaped towns and cities. Prereq: Consent of instructor.

511 Environmental Influences (3) Environmental factors which influence regional character of architecture. Natural forces associated with these factors, cultural interpretation and response regarding importance and impact.

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

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

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

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

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

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

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

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

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

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

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

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


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


591 Foreign Study (1-9)

592 Off-Campus Study (1-9)

593 Independent Study (1-9)

Art (College of Arts and Sciences)

MAJOR DEGREE

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

Norman Magden, Head

Professors:

Assistant Professors:
Brogen, Sally B., M.A. ...................... NY State College of Ceramics (Alfred)

Hilles, Timothy, Ph.D. ........................ Penn State

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

THE MASTER'S PROGRAM

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

1. A detailed letter of intent including statement requesting assistantship, if desired.
2. Three letters of recommendation from former professors or professionals in the field.
3. An undergraduate major in art or evidence of equivalent proficiency.
4. A portfolio to be evaluated by the faculty.

Further information is available by writing to the Department of Art.

M.F.A. Requirements

A minimum of 60 hours is required:
1. Successful completion of 20 hours of studio in a concentration area. Ten hours of studio credit must be completed by the graduate student during the first year of study.

2. A minimum of 9 hours of art history for graduate credit.

3. Eleven hours of electives which may consist of any combination of courses offered by the University for graduate credit.

4. Art 599, Project in Lieu of Thesis (20 hours). A third year of semi-independent study. Students must have completed all other coursework prior to registration.

5. A student with the permission of the area faculty can petition to take 3 hours of outside academics as a substitute for 3 hours of art history or 3 hours of concentration area. The petition is to be presented to the graduate committee for final approval and should directly address the need and relevance of this substitution to the student's concentration.

Four semesters (normally the first 40 hours) beyond the Bachelor's degree are required in residence. An exception is made for working professionals who may complete their first 20 hours, with the permission of the faculty, on a part-time basis. Residence is defined by the Department of Art as (1) a minimum enrollment of 6 hours per semester and (2) use of University facilities so that students are available for discussion and criticism.

The candidate's committee will consist of a minimum of 3 members and a maximum of 6
members and will be appointed prior to registration for Art 599. Three members of the committee shall be as follows: one from the candidate’s concentration area who shall be the major professor; one from art history, and one from a studio discipline outside the concentration area.

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

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

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

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

Art
GRADUATE COURSES
481 Museology I: Museums, Purpose and Function (3) Development of museums of art, history, natural and applied science. (Same as Anthropology 481.)
482 Museology II: Exhibition Planning and Installation (3) Exhibition concept development and implementation. Exhibition design and installation techniques. Publicity, production, mounting and framing, shipping and storage. Prereq: 481 or consent of instructor. (Same as Anthropology 482.)
484 Museology III: Field Projects (1-12) Special field projects: restoration, preservation, registration, and other related research on off campus. Prereq: 481 and 482. May be repeated. Maximum 12 hrs. (Same as Anthropology 484.)
499 Special Topics (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Determined by department. May be repeated. Maximum 12 hrs.

492 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E
502 Special Topics in Drawing and Painting (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Determined by department. May be repeated. Maximum 12 hrs.
592 Foreign Study (1-15) See College of Arts and Sciences.
593 Independent Study (1-15) See College of Arts and Sciences.
599 Projects in Lieu of Thesis (10) Prereq: All graduate course work and successful second year evaluation by graduate faculty. May be repeated. Maximum 20 hrs. S/NC only. E

Art Ceramics
GRADUATE COURSES
425 Ceramics: History Seminar (3) History of ceramics through lectures and student presentations. May not be used toward art history requirement. Prereq: Ceramics: Portfolio Review.
426 Ceramics: Kiln Design (3) Designing kilns, traditional and modern reduction, construction methods, and kiln operation. Prereq: Ceramics: Portfolio Review.
429 Ceramics: Special Topics (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Determined by department. May be repeated. Maximum 12 hrs.
521 Graduate Ceramics I (2-6) May be repeated. Maximum 10 hrs.
525 Graduate Ceramics II (2-6) May be repeated. Maximum 10 hrs.
593 Independent Study (1-15) See College of Arts and Sciences.
599 Projects in Lieu of Thesis (10) Prereq: All graduate course work and successful second year evaluation by graduate faculty. May be repeated. Maximum 20 hrs. S/NC only. E

Art Drawing
GRADUATE COURSES
411 Drawing IV (6) Individualized pursuit of personal drawing techniques and concepts; supplemented by individual and group critiques; weekly life drawing sessions. Prereq: 411. May be repeated. Maximum 12 hrs.
419 Special Topics in Drawing and Painting (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Determined by department. May be repeated. Maximum 12 hrs.
419 Special Topics (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Determined by department. May be repeated. Maximum 12 hrs.
511 Graduate Drawing I (2-6) May be repeated. Maximum 10 hrs.
512 Graduate Drawing II (2-6) May be repeated. Maximum 10 hrs.

Art History
GRADUATE COURSES
471 History of North American Art (3) Landmarks in painting, architecture, sculpture, and design from prehistory to 1850.
472 History of 20th-Century American Art (3) Development in architecture, painting, and design from 1900.
473 19th-Century American Painting (3) From West and Copley to emergence of "The Eight."

Art Design/Graphic
GRADUATE COURSES
451 Advanced Graphic Design (3) Theory and techniques of visual problem solving as applied to advanced applications of graphic design. Prereq: Intermediate Graphic Design II.
453 Advertising Illustration (3) Media and techniques as applied to advertising illustration. Prereq: Black and White Illustration and successful completion of any portfolio review.
454 Editorial Illustration (3) Media and techniques as applied to editorial illustration for books, magazines, and newspapers. Prereq: Black and White Illustration and permission to register for. Prereq: 451.
456 Graphic Design Practicum (3) Practical work experience in graphic design field. Only by preregistration with department. Prereq: Senior standing and consent of instructor. May be repeated. Maximum 12 hrs.
459 Special Topics in Graphic Design (3) Student- or instructor-initiated course offered at convenience of department. Prereq: Determined by department. May be repeated. Maximum 12 hrs.
550 Studies in Graphic Design/Illustration History (3) Design and illustration ca. 1850 to present. Prereq: M.F.A. candidate or consent of department. May be repeated. Maximum 6 hrs.
551 Graphic Design I (2-6) May be repeated. Maximum 10 hrs.
552 Graphic Design II (2-6) May be repeated. Maximum 10 hrs.
553 Computer Enhanced Design (2-6) Prereq: Consent of instructor. May be repeated. Maximum 10 hrs.
593 Independent Study (1-15) See College of Arts and Sciences.
599 Projects in Lieu of Thesis (10) Prereq: All graduate course work and successful second year evaluation by graduate faculty. May be repeated. Maximum 20 hrs. S/NC only. E

Art


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

485 History of Printmaking (3) Prints from the 15th century to present. 20th century in Europe and the U.S. Prereq: 172 and 173.

486 Art of Indian Asia (3) History of Indian art: Central Asia and South Asia.

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

515 Graduate Watercolor I (2-6) May be repeated. Maximum 10 hrs.

514 Graduate Painting II (2-6) May be repeated. Maximum 10 hrs.

531 Photography I (2-6) May be repeated. Maximum 10 hrs.

521 Photography II (2-6) May be repeated. Maximum 10 hrs.

535 Media Arts I (2-6) May be repeated. Maximum 10 hrs.

536 Media Arts II (2-6) May be repeated. Maximum 10 hrs.

577 Studies in Media as Art (3) Selected topics in theory and history of media as art form. Prereq: Modern Art and Film or consent of instructor. May be repeated. Maximum 9 hrs.

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

595 Visiting Artist Seminar (2) Contemporary art issues by different visiting artists. May not be used toward art history requirement. May be repeated. Maximum 6 hrs.

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

GRADUATE COURSES

Art Painting

413 Painting IV (6) Individual concepts and personal expression with varied media. Prereq: 313. May be repeated. Maximum 12 hrs.


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

513 Graduate Painting I (2-6) May be repeated. Maximum 10 hrs.

514 Graduate Painting II (2-6) May be repeated. Maximum 10 hrs.

515 Graduate Watercolor I (2-6) May be repeated. Maximum 10 hrs.

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

595 Visiting Artist Seminar (2) Contemporary art issues by different visiting artists. May not be used toward art history requirement. May be repeated. Maximum 6 hrs.

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

Art Printmaking

GRADUATE COURSES

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

463 Lithography III (3-6) Exploration of individual projects through advanced lithographic methods in combination with other print media. Prereq: Intermediate Lithography or consent of instructor. May be repeated. Maximum 12 hrs.

454 Screen Printing III (3-6) Individual development of screen printing problems and techniques: development of image and personal concept. Prereq: Intermediate Screen Printing or consent of instructor. May be repeated. Maximum 12 hrs.

Screen Printing or consent of instructor. May be repeated. Maximum 12 hrs.

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

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

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

563 Printmaking III (3-6) Directed exploration of any or all matrix-based imaging: intaglio, relief, lithography, screen printing, photo-print methods and monoprint. Prereq: 561, 562.

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

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

Arrowmont

GRADUATE COURSES

Courses listed below offered periodically only at the Pi Beta Phi Arrowmont School of Crafts, Gatlinburg, Tennessee. Courses may be repeated. Upon admission to the M.F.A. program at UT Knoxville, a student may apply certain graduate courses taken at Arrowmont toward the degree, subject to the approval of the student's graduate committee.

400 Special Topics (2-4) Student- or instructor-initiated course offered at convenience of department. May be repeated.
Astronomy
See Physics and Astronomy

Audiology and Speech Pathology
(College of Arts and Sciences)

MAJORS DEGREES
Audiology.................................................. M.A.
Speech and Hearing Science.......................... Ph.D.
Speech Pathology......................................... M.A.

Patrick J. Carney, Head

Professors:
Asp, Carl W., Ph.D................... Ohio State
Carney, Patrick J. (Liaisson), Ph.D........... Iowa
Luper, Harold L. (Emeritus), Ph.D. .... Ohio State
Nabelek, Igor V. (Emeritus), Sc.D. ...... Prague
Peterson, H. A., Ph.D. ......... Illinois
Silverstein, B., Ph.D. ................... Purdue
Wallace, Glorijean L., Ph.D. .... Northwestern

Associate Professors:
Burchfield, Samuel B., Ph.D. ....... Michigan State
Ferrill, Charles J., M.A. ............ Tennessee
Gordon, Pearl A., Ph.D. .............. Tennessee
Kishnan, Ravil A., Ph.D. .......... Texas
Thelin, J. W., Ph.D. .............. Iowa

Assistant Professor:
Ruark, Jacki L., Ph.D. ................. Pittsburgh
Swanson, Lori A., Ph.D. ........... Purdue

THE MASTER'S PROGRAM

A major is offered in Audiology or in Speech Pathology. A minor is offered in each of the two areas when approved by the department.

The intent of each major program is to provide the student with the scholarly and professional skills necessary for functioning as an independent professional clinician in any clinical environment.

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

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

THE DOCTORAL PROGRAM

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

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

The program will normally consist of three or more calendar years of graduate study beyond the master's degree with the first year being devoted primarily to formal coursework and the last year to full-time research culminating in the doctoral dissertation. The total program is a minimum of 60 semester hours, including a minimum of:

1. 24 semester hours in dissertation 600.
2. 6 semester hours in a research tool.
3. 3 semester hours in a course that is a prerequisite outside the department.
4. 24 semester hours in 600-level coursework within the department of which:
a. a minimum of 6 semester hours in the topic of major interest;
b. a minimum of 6 semester hours in the topic(s) of related interest;
c. 2 semester hours in 611; and
4. 3 semester hours in supervised teaching experience.
5. A comprehensive examination to demonstrate knowledge in the concentration area and an examination of research competence.
6. A final oral examination.

ACADEMIC COMMON MARKET

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

GRADUATE COURSES

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

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

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


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


465 Speech and Language of the Culturally Different Child (3) Speech and language difficulties of children of various minority groups, of different ethnic and class memberships and from different geographic regions.

473 Audiology II (3) Basic principles of clinical audimetry; pure tone, speech, masking and overview of special auditory tests. Prereq: 371.

484 Aural Habilitation/Rehabilitation of the Hearing Impaired (3) Psychosocial aspects, amplification components, characteristics, assistive devices, speech acoustics, speech perception, speech reading, parent-infant, preschool school years of children, communication impairments/handicaps/remediation of adults, effects of aging/remediation on the elderly, and case studies. Prereq: Phonetics and Acoustics of Speech and Hearing, or consent of instructor.

490 Laboratory of Speech and Hearing Research (3) Analysis of research techniques, fundamentals of experimental design, completion of a research project, and the writing of a research report. Prereq: 473.
Prereq: 473 or equivalent or consent of instructor.

514 Practicum in Verbo-Tonal Habilitation (1-4) Prereq: 494, 555, or consent of instructor. May be repeated. Maximum 6 hrs.

515 Practicum in Aural Rehabilitation (1-4) Prereq: 473 and 494. May be repeated. Maximum 6 hrs.

517 Instrumentation in Audiology and Speech Pathology (3) Principles of instrumentation in audiology and speech patholology. Laboratory assignments for familiarization of students with measuring speech and hearing processes.

520 Aphasia (3) Historical review of aphasia literature, theories of brain functioning, aphasic classification and terminology, testing for aphasia, treatment principles, therapy considerations and prognosis for recovery. Prereq: 506 or equivalent or consent of instructor.

522 Seminar: Articulation and Voice Disorders (3) Current research in diagnosis and management of articulation and voice disorders. Prereq: Undergraduate courses in articulation and voice disorders or consent of instructor.

524 Traumatic Brain Injury (3) Advanced neuropsychological and cognitive neuropsychological principles. Medical and speech-language pathology perspectives on traumatic brain injury (TBI) related to adult TBI population. Prereq: 506 and 520, or consent of instructor.

531 Seminar on Stuttering (3) Current research in stuttering. Prereq: 431 or consent of instructor.

532-33-34 Advanced Clinical Practice in Speech-Language Pathology (3) Seminar: Articulation and Voice Disorders (3) Current research in diagnosis and management of articulation and voice disorders. Prereq: 494 or equivalent and consent of instructor, 534 may be repeated. Maximum 6 hrs. Enrolment for less than 2 hrs must have prior departmental approval.

535-36-37 Advanced Clinical Practice in Speech-Language Pathology (3) Seminar: Articulation and Voice Disorders (3) Current research in diagnosis and management of articulation and voice disorders. Prereq: 506 or equivalent and consent of instructor.

539 Motor Speech Disorders (3) Neomotor organization for speech production: types of motor speech disorders and associated neuromuscular symptomatology; diagnosis and management of motor speech disorders. Prereq: 506.

540 Advanced Clinical Practice in Speech-Language Pathology: Public Schools (1-4) May be repeated. Maximum 6 hrs. Enrollment for less than 2 hrs must have prior departmental approval.

542 Hearing Disorders (3) Effects of heredity, development, aging, diseases, and physical agents on hearing. Prereq: 475 or equivalent or consent of instructor.

543 Amplification Technology (3) Description of hearing aid circuits, components and performance characteristics. Electroacoustical and real ear analysis of hearing aids. Coupler material and geometry effects. Practical experience in troubleshooting, repair, and construction of hearing aids. Prereq: 473 and 507 or equivalents or consent of instructor.


545 Sound Measurement Techniques and Hearing Conservation (3) Techniques of measurement and analysis of sound; hearing conservation in schools and industry. Prereq: Consent of instructor.

546 Advanced Audiology (3) Theoretical bases for behavioral audiometry and acoustic immittance measurement. Prereq: 473 or equivalent or consent of instructor.

547 Special Problems in Audiology (1-3) Prereq: 473 or equivalent or consent of instructor. May be repeated. Maximum 6 hrs.

548 Special Study in Audiology (1-3) Special reading, consultation, and research activities in field of audiology. May be repeated. Maximum 6 hrs.

549 Hearing Science (3) Study of psychoacoustic phenomena and how they relate to perception and diagnostic audiology. Prereq: 473, 507, and 546 or equivalents or consent of instructor.

550 Seminar in Audiology (1-3) Significant research in various areas of audiology, presentation of results. Prereq: Consent of instructor. May be repeated. Maximum 10 hrs.

552 Seminar in Speech Pathology (2-3) Current significant research in speech pathology. Topics vary. Prereq: 5 hrs in speech pathology. May be repeated with consent of department. Maximum 9 hrs.

555 Special Problems in Speech-Language Pathology (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

556 Independent Study in Speech-Language Pathology (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

557 Management and Supervision for Speech-Language-Hearing Professionals (3) Management systems, accountability, performance appraisal and clinical supervision for audiologists and speech pathologists involved in private practice, supervisory or administrative positions.

562 Preschool Language Disorders (3) Assessment and remediation strategies for specifically language-impaired children (ages 3-5). Techniques for special populations. Prereq: 461 or consent of instructor.

563 Practical Applications of Language Habilitation Techniques (3) Identification and treatment of communicative disorders in infants and toddlers: family-centered services and family systems. Prereq: 461 or equivalent or consent of instructor.

565 School-Age Language Disorders (3) Review of current literature on assessment and intervention techniques for school-age language learners. Prereq: 461 or consent of instructor.

567 Multidisciplinary Models for Speech and Language (2) Identification and treatment of communicative disorders in infants and toddlers. Family-centered services and family systems. Prereq: 461 or equivalent or consent of instructor.

568 Electrophysiological Assessment of Auditory Function (3) Auditory-evoked potentials and their auditory and otologic origin. Use of various evoked potentials in evaluation of auditory function and determination of site(s) of lesion. Prereq: 473, 507, and 546, or equivalents or consent of instructor.

569 Vestibular Disorders (3) Anatomy, physiology, and pathophysiology of vestibular system and other systems that contribute to balance. Practical in electronystagmography and video-oculography. Prereq: 507, 542, 544, and 576 or equivalents or consent of instructor.

570 Psycholinguistic Concepts in Speech Pathology (3) Psycholinguistic concepts and information theory in understanding the normal acquisition of language and certain disorders of language. Prereq: Consent of instructor.

572 Language and Speech Services in School (3) Organization and implementation of speech and language programs in schools.

573 Practice in College Teaching (1-3) Supervised experience in college teaching. Prereq: Consent of instructor. May be repeated. Maximum 8 hrs.

575 The Verbo-Tonal System: Auditory/Speech Perception (3) Innovative theory, therapy procedures, and SLJAV amplification/processing for diagnosis/evaluation/ remediation of spoken language processing skills of hearing-impaired children/adults: use of rhythms, movements and suprasegmentals; special audiotet measurements; acoustic filters, correcting misarticulations through optimal listening; central auditory treatment; second (foreign) language through listening/spoken language; relationship between categories of individual student research reports. Prereq: Phonetics and Acoustics of Speech, 473 and 494 or equivalents or consent of instructor.

580 Seminar in Speech Science (2) Experimental arena: speech physiology, acoustic analysis, recognition, perception and intelligibility of speech, communication theory, and psycholinguistic measurement of speech and language. Topics vary. Prereq: 601 or consent of instructor. May be repeated. Maximum 6 hrs.

581 Seminar in Hearing Science (2) Advanced study of perception of non-speech acoustic signal, detectability, pitch, loudness, differential threshold, adaptation, and fatigue. Prereq: 602 or consent of instructor. May be repeated. Maximum 6 hrs.


602 Psychoacoustics (3) Auditory perception and reception of non-speech and speech stimuli. Prereq: 517.

603 Language Science (3) Seminar of theories and paradigms of research on acquisition and use of language. Prereq: Consent of instructor.


608 Seminar in Speech Science (2) Advanced study of perception of non-speech acoustic signal, detectability, pitch, loudness, differential threshold, adaptation, and fatigue. Prereq: 602 or consent of instructor. May be repeated. Maximum 6 hrs.

610 Seminar in Hearing Science (2) Advance study of perception of non-speech acoustic signal, detectability, pitch, loudness, differential threshold, adaptation, and fatigue. Prereq: 602 or consent of instructor. May be repeated. Maximum 6 hrs.

611 Experimental Design in Speech and Hearing (3) Analysis of experimental design in theses and related journals. Generation of experimental designs. Prereq: Consent of instructor.

625 Advanced Seminar in Neurologically-based Communication Disorders (3) Topics vary. Prereq: 520, 523, or consent of instructor. May be repeated. Maximum 6 hrs.

650 Advanced Seminar in Audiology (2) Topics vary. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

652 Advanced Seminar in Speech and Language (2) Topics vary: aberrations of voice, articulation, speaking time and rhythm, language development or use, and language symbolism. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

655 Practicum in College Teaching (1-3) Supervised experience in college teaching. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. S/NC only.

656 Directed Research (1-4) Participation in ongoing or non-dissertation research. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

657 Directed Study in Speech Pathology (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

660 Directed Study in Audiology (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

666 Directed Study in Hearing Science (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

661 Advanced Seminar: Language Disorders in Children (3) Topics vary. Prereq: 565 or consent of instructor. May be repeated. Maximum 6 hrs.
Aviation Systems
(UT Space Institute)

MAJOR DEGREE
Aviation Systems.......................... M.S.

R. D. Kimberlin, Program Chair

Professors:
Collins, F. G., Ph.D. ....................... California
Mason, A. A. (Emeritus), Ph.D. .......... Tennessee
Paladin, C. T., Ph.D. ....................... Denver
Wu, J. M., Ph.D. ......................... Cal Tech
Young, R. L. (Emeritus), Ph.D. .... Northwestern

Associate Professors:
Kimberlin, R. D. (Liaison),
Ph.D. ........................................ RWTH (Germany)
Solies, U. P., Ph.D. ......................... Tennessee

The University of Tennessee Space Institute offers a program leading to the Master of Science degree with a major in Aviation Systems. The Aviation Systems program is designed for those who possess a Bachelor's degree in engineering or science and wish to study under a "system philosophy" toward careers in research and development or administration in areas pertinent to aviation. Current emphases include flight testing, aircraft design, aviation meteorology, air traffic control, and airport management.

To qualify for admission to this program, the applicant must possess a Bachelor's degree in engineering or science from an accredited institution, show evidence of ability to pursue and benefit from the program, and fulfill the University of Tennessee Graduate School admission procedures and grade-point standards. It is expected that the student will have a basic knowledge of computer utilization and statistics, an understanding of aerodynamic fundamentals, aircraft propulsion, and performance; and some understanding of economics.

Both thesis and non-thesis programs are available. The thesis program involves a minimum requirement of 30 semester hours credit while the non-thesis program involves a minimum of 33 semester hours credit.

THESIS OPTION

The thesis program involves satisfactory completion of the following requirements:

Research and Development Specialization
1. Twelve hours of 500-level courses in the major field of aviation systems.
2. Six hours in industrial engineering (engineering management).
3. Six hours of electives from the major field, mathematics or engineering.
4. Six hours of Aviation Systems 500 demonstrating the ability to conduct and report on an independent investigation.

Non-Thesis Option
The non-thesis program will be permitted in special circumstances and involves satisfactory completion of the following requirements:

Research and Development Specialization
1. Twelve hours of 500-level courses in the major field of aviation systems.
2. Six hours in industrial engineering (engineering management).
3. Twelve hours of electives in the major field, mathematics or engineering.
4. Three hours of an assigned project under Aviation Systems 550.
5. A comprehensive final written examination on all coursework submitted for the degree and defense of the project course paper.

Administration Specialization
1. Twelve hours of 500-level courses in the major field of aviation systems.
2. Three hours in industrial engineering (engineering management).
3. Three hours in economics or finance.
4. Twelve hours of electives in the major field, mathematics or engineering.
5. Three hours of an assigned project under Aviation Systems 550.
6. A comprehensive final written examination on all coursework submitted for the degree and defense of the project course paper.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The M.S. program in Aviation Systems is available to residents of the states of Arkansas, Florida, Mississippi, or West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

500 Thesis (1-15) P/NP only. E
501 Aviation Systems: An Overview (3) Aviation systems, present and future. Socioeconomic base, aerospace and propulsion technology, meteorology, air traffic control, airport community interface, and technological trends and developments pertinent to present status and future development of air transportation.
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N only. E
503 Air Vehicles (3) Current capabilities and future requirements for civilian and military air vehicles. Parameters significant for air vehicle type selection. Integration of air vehicle into aviation systems. Prereq: 501.
505 Governmental Policies for Aviation (3) Theoretical and legal basis for economic and governmental regulation of aviation. Historical and legislative development of aviation regulatory agencies, organizational structure, administrative and enforcement procedures. Prereq: 501.
506 Aircraft Design (3) Design process, compromise of conflicting requirements, economic, industrial, and legal aspects. Definition of mission requirements, synthesis and optimization techniques, safety and reliability, systems integration, standards and regulations, teamwork and decision-making.
510 Special Topics in Aviation Systems (3) Current problems. Prereq: Consent of instructor. May be repeated with consent.
550 Project in Aviation Systems (3) Enrollment limited to Aviation Systems students in non-thesis program. May be repeated. Maximum 3 hrs allowed toward degree.
588 Measurement Science I (3) Same as Nuclear Engineering 588, Mechanical and Aerospace Engineering 588, Civil Engineering 588.
589 Measurement Science II (3) Same as Nuclear Engineering 589 and Engineering Science and Mechanics 589.

Biochemistry and Cellular and Molecular Biology
(College of Arts and Sciences)

MAJOR DEGREES
Biochemistry .............................. M.S., Ph.D.

John W. Koontz, Head

Professors:
Bagby, R. M., Ph.D. ....................... Illinois
Becker, J. M., Ph.D. ....................... Cincinnati
Carlson, J. G. (Emeritus) (Distinguished Prof.), Ph.D. ................................ Pennsylvania
Chen, T. T., Ph.D. ............................ Florida
Churchich, Jorge E., Ph.D. .............. Sheffield
Handel, Mary Ann (Distinguished Prof.), Ph.D. ............................ Kansas State
Jeon, K. W., Ph.D. ............................ London
Joshi, J. G., Ph.D. ............................ Poona
Joy, D. C. (Distinguished Scientist), Ph.D. ................................ Oxford (UK)
Kennedy, J. R., Ph.D. ....................... Iowa
Liles, J. N. (Emeritus), Ph.D. .......... Ohio State
MacCabe, J. A. (Emeritus), Ph.D. ....... California (Davis)
Monty, Kenneth J., Ph.D. .............. Rochester
Roth, L. Evans, Ph.D. ...................... Chicago
Salo, T. P. (Emeritus), Ph.D. .......... Michigan
REQUIREMENTS FOR ADMISSION

Applicants for graduate study are expected to have a background equivalent to that required of undergraduate majors in this department. This includes a knowledge of the basic principles of biochemistry, cell biology, genetics, and physiology. Requirements for admission are:

1. One year of general biology or the equivalent;
2. A minimum of 8 semester hours of approved biology courses beyond the introductory level and including the subject areas of genetics, cell biology, and physiology;
3. Two years of chemistry including one year of general chemistry and one year of introductory Organic Chemistry with laboratory;
4. At least one semester of biochemistry;
5. One year of calculus;
6. One year of physics;
7. Graduate Record Examination scores; and
8. A minimum grade-point average of 3.0 out of 4.0.

Otherwise superior students, deficient in one or more of the above requirements, may be admitted at the discretion of the department's Graduate Recruiting Committee.

THE MASTER'S PROGRAM

1. Biochemistry and Cellular and Molecular Biology 511-12, 515-16, and 517.
2. Completion of course requirements as determined by the candidate's faculty committee.
3. Achievement of a 3.0 or better GPA in all courses taken for graduate credit.
4. At least 6 hours of advanced seminar courses from the following: 601 through 611.
5. Six hours of master's research and a thesis.
6. A final examination that covers both the thesis endeavor and the subject matter of the course requirements.

THE DOCTORAL PROGRAM

1. Biochemistry and Cellular and Molecular Biology 511-12, 515-16, and 517.
2. At least two approved graduate courses in the life sciences or chemistry, or physics, or other physical science to be determined by consultation with the mentor and the dissertation committee. No survey courses will be accepted.
3. At least 6 hours of topics offered in 615.
4. Participation in 601 and 603 during the entire period of residence. Participation in one other seminar or journal clubs each semester in residence.
5. Comprehensive examination, taken before the end of the third year of study.
6. A dissertation reporting the results of original and significant research carried out during the term of candidacy.
7. A final oral examination which will be concerned primarily with the student's dissertation.

Petitioning for Master's Degree

Students who have passed the comprehensive examination in the Ph.D. program and have completed at least 30 hours of approved coursework for graduate credit, at least two thirds of which must be at or above the 500 level, may petition the department for award of a master's degree. The additional requirements for such a degree are:

1. The preparation of a research manuscript suitable for submission for publication in a major scientific journal and oral defense of that manuscript before an examining committee of three faculty members appointed by the head of the department, at least two of whom shall be members of the department; or
2. Publication of at least one full-length paper in a major scientific journal as senior author.

ACADEMIC COMMON MARKET

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

GRADUATE COURSES

403 General Genetics Laboratory (3) Experiments designed to illustrate basic principles of inheritance; primary organism—Drosophila. Prerequisite: General Genetics 2 lab.
410 Cellular and Comparative Biochemistry (4) Electrophoresis, biochemistry, chemistry and structure of proteins; enzyme structure and biochemical functions; catabolism and energy capture; synthetic metabolism; acidic and basic protein synthesis; and biochemical genetics; regulation of biochemical processes. Prerequisite: Organic Chemistry and General Biology, 3 hrs and 1 discussion. F,Sp
419 Cellular and Comparative Biochemistry Lab (2) Experiments with enzymes, nucleic acids, and membrane and organelles. Chromatography, electrophoresis, hybridization, sequencing, and immunological methods. Prerequisite: Biochemistry 1 or consent of instructor. E,Sp
421 Cell and Tissue Structure and Function (4) Study of animal cells and tissues at light and electron microscope levels. Prerequisite: Cell Biology, 2 hrs and 2 labs.
430 Immunology (3) (Same as Microbiology 430.)
439 Immunology Laboratory (2) (Same as Microbiology 439.)
449 Laboratory in Physiology (2) Prerequisite: coreq: 440 or 445.
465 Human Genetics (3) Genetic and molecular principles and problems of human inheritance. Prerequisite: General Genetics.
471-81 Biophysical Chemistry (3, 3) Physical principles with applications to biological systems. 471--
impact. Prereq: 410, Organic Chemistry or consent of instructor. (Same as Ecology and Evolutionary Biology 561.) F.


564 Introduction to Electron Microscopy—Scanning Electron Microscope (3) Practical introduction to techniques of electron microscopy and to scanning electron microscopy. Use of microscope, introduction to darkroom techniques and digital image processing, preparation of samples for observation, and special project. Prereq: Consent of instructor, 2 hrs and 1 lab. Sp.

570 Advanced Concepts in Cellular/Molecular Biology (3) Concepts related to cellular and molecular biology with information taken from current literature. Predomi- nantly lecture format with student participation. Specific subject area to be announced. Prereq: Consent of instructor. May be repeated.

580 Advanced Concepts in Genetics/Developmental Biology (3) Concepts related to genetics/developmental biology with information taken from current literature. Predominantly lecture format with student participation. Specific subject area to be announced. Prereq: Consent of instructor. May be repeated.

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

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

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

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


603 Graduate Research Colloquium (1) Seminars and lectures dealing with current advances in fields of biochemistry and biophysical methods. Required every semester in residence. S/NC only. F, Sp.

604 Current Topics in Environmental Toxicology (1) Critical reviews of research problems and methods in environmental toxicology, behavioral toxicology, biochemical and biophysical effects, biostatistics and statistics. Presentations by students, faculty, and guest lecturers from academia and industry. May be repeated with consent of department. Maximum 4 hrs. (Same as Ecology and Evolutionary Biology 604.) S/NC only. F, Sp.

605 Journal Club in Neurophysiology/Physiology (1) Readings and discussion based on current literature. May be repeated. Maximum 12 hrs. S/NC only.

606 Journal Club in Structural Biology/Biochemistry (1) Readings and discussion based on current literature. May be repeated. Maximum 12 hrs. S/NC only.

607 Journal Club in Cellular/Molecular Biology (1) Readings and discussion based on current literature. May be repeated. Maximum 12 hrs. S/NC only.


610 Current Topics in Biochemistry, Cellular, and Molecular Biology (1-2) Critical reviews of research problems and methods in biochemistry, cell biology and/ or molecular biology. Oral presentations, written reports, computer simulations by faculty and students. Prereq: Consent of instructor. May be repeated. Maximum 4 hrs.

611 Advanced Topics in Medical Science (Same as Comparative and Experimental Medicine—Graduate School of Medicine 611.)

615 Special Topics in Biochemistry, Cellular, and Molecular Biology (3) Biochemical and biophysical methods, mechanisms of enzyme catalysis, gene expression, membrane structure and function, metabolic regulation, physical biochemistry, molecular genetics, cell ultrastucture and physiology, neurobiology, and related topics. Prereq: 511-12 or consent of instructor. May be repeated. Maximum 9 hrs.

Biomedical Sciences

(Office of the Vice Chancellor for Academic Affairs)

MAJOR

Biomedical Sciences ................. M.S., Ph.D.
Raymond A. Popp, Director

Professor:
Olins, Donald E., Ph.D. ................. Rockefeller Popp, Raymond A., Ph.D. ................. University
Popp, Raymond A., Ph.D. ................. New York
Research Professor:
Olins, Ada L., Ph.D. ..................... New York
Assistant Research Professor:
Hauser, Loren, Ph.D. ..................... California (Irvine)

Shared faculty are drawn from the Oak Ridge National Laboratory.

The University of Tennessee-Oak Ridge Graduate School of Biomedical Sciences, located within the Biology Division of Oak Ridge National Laboratory, offers programs leading to the Master of Science and the Doctor of Philosophy. The National Laboratory is a well-known center of basic research. The school utilizes the staff and facilities of this laboratory and thus brings directly into the mainstream of full-time graduate study in the life sciences the talent and experience of that staff, as well as the most advanced research methods and technology.

The program of study, which incorporates a high faculty-to-student ratio, is based on intensive graduate courses supplemented by tutorial instruction, participation in a wide variety of seminars, and a heavy emphasis on communication skills, research training, and independent study. The program encourages students to pursue graduate studies to the limits of their abilities.

Each student's curriculum is planned to meet individual needs, with the aim of giving: (1) strength in the basic sciences, (2) perception of the biomedical sciences as a whole, and (3) experience and training in a chosen specialty.

The concentration areas available for master's thesis and Ph.D. dissertation work are biochemistry, biophysics, carcinogenesis, genetics, cellular, developmental and mammalian genetics, and radiation biology. Included are such subjects as immunology, protein and enzyme chemistry, nucleic acid chemistry, cytolgy, radiation and environmental biology, virology, developmental biology, experimental pathology, microbial and mammalian genetics, mutagenesis, structural biology, and genomic analyses.

ADMISSION REQUIREMENTS

A Bachelor's degree or its equivalent is required. Students with M.S., D.V.M., or M.D. degrees are also encouraged to apply. Completed applications, Graduate Record Examination scores and letters of reference should be sent to the address below. The student will need preparation in biology, calculus, physics, and organic and physical chemistry. A course in physical chemistry is offered by the school in order to meet the last requirement. It is recommended that deficiencies in preparation, as identified in the admission process, be eliminated prior to entrance.

Requests for application forms, information on admission, financial support, and specialization should be sent to Director, University of Tennessee-Oak Ridge Graduate School of Biomedical Sciences, Biology Division, ORNL, Box 2009, Oak Ridge, Tennessee 37831-8077.

THE DOCTORAL PROGRAM

1. Satisfactory (B grade or better) completion of the following core courses or their equivalent: Biochemistry (511); Biophysical Biochemistry (514); Genetics (515); Cell Biology (518); Computing for the Life Sciences (525); and Statistics for Biologists (574).

2. Three semesters of Biomedical Sciences Laboratory (531-32-33).

3. Participation in at least one of the seminars during each term of residence after the first year is strongly recommended.

4. Satisfactory completion of formal advanced courses in the areas of the student's interests. The number and nature of the required advanced courses will vary depending upon the student's background and area of specialization.

5. Passing both written and oral comprehensive examinations.

6. A dissertation reporting the results of original and significant scientific research. A minimum of 24 semester hours of course 600 is required.

7. A final oral examination on the dissertation.

8. A formal seminar presentation of the dissertation research.

SPECIAL MASTER OF SCIENCE DEGREE PROGRAM

The graduate faculty has designed a Master of Science program in Biomedical Sciences primarily to fill the need for such a degree within the Oak Ridge National Laboratories; however, a limited number of students from other institutions may be accepted if qualified and space is available. The requirements for the degree are:

1. Graduate credit or a proficiency in the following core courses or their equivalents: Biochemistry (511); Biophysical Biochemistry (514); Cell Biology (518); plus any three of the following courses: Genetics (515); Statistics for Biologists (574); or Computing for the Life Sciences (525). Additional credits may be obtained (6 to 15 hours) with electives.

2. Thirty hours of approved graduate courses including 6 hours for thesis.

3. For admission to candidacy: Completion of any required prerequisite courses and one semester of graduate coursework with a B average. Admission to candidacy forms must be filed at least one full semester prior to receipt degree.
**MAJOR REGISTRATION REQUIREMENTS**

The Botany Department requires scores from the general portion of the Graduate Record Examination, at least three letters of recommendation, and a statement of academic or professional persons, a short statement describing reasons for interest in graduate education in botany, and the following academic requirements:

1. Bachelor's degree (from a regionally accredited college or university) and a cumulative grade-point average of at least 2.5. 
2. Educational service in the form of teaching assistantship and/or ancillary services; consult major professor and department head.

**ADMISSION REQUIREMENTS**

The Botany Department requires scores from the general portion of the Graduate Record Examination, at least three letters of recommendation, and a statement of academic or professional persons, a short statement describing reasons for interest in graduate education in botany, and the following academic requirements:

1. Bachelor's degree (from a regionally accredited college or university) and a cumulative grade-point average of at least 2.5.
2. Educational service in the form of teaching assistantship and/or ancillary services; consult major professor and department head.

**THE DOCTORAL PROGRAM**

The Doctor of Philosophy program is patterned to provide training that involves extensive independent research within the student's area of concentration. Although there is no formal program of coursework, the student's committee may require specific courses for the completion of the degree. Most students spend from three to five years working on their Ph.D.
Requirements for successful completion of the Ph.D. are as follows:

1. Satisfactory presentation of a research problem by means of a written proposal and an oral defense to the student's committee. This must be completed before enrollment in Botany 600.

2. Satisfactory performance on a written examination.

3. One of more cognate areas outside of the department totaling 6 hours of graduate credit with at least a B average.

4. Satisfactory performance on an examination in one modern foreign language (see Graduate Coordinator) or an A or B in French 302 or German 332.

5. Satisfactory completion of 6 hours at the 600 level (excluding dissertation).


7. Presentation of a departmental seminar near the end of the doctoral program.

Note: The listed requirements for the M.S. and Ph.D. degrees should be interpreted as minimal requirements. Specific stipulations or requirements such as additional foreign languages or an additional oral comprehensive examination may be required by the student's faculty committee.

GRADUATE COURSES

401-02 Field Studies in Botany (1-3, 1-2) Field experience and taxonomy of special plant groups. Topics vary: Bryology, lichenology, pteridology, agrostology, mycology, phycology, aquatic vascular plants, systematic, ecology, phytogeography, wetlands, and botanical photography. May be repeated under different topic. Maximum 9 hrs.


412 Plant Anatomy (3) Cells, tissues, and organs; development in vegetative and reproductive structures of vascular plants-seeds and plants. Prereq: 110-20 or Biology 110-20.

451 Plant Tissue Culture (3) Methods for culture of cells, tissues, and organs: media preparation and maintenance of cultures. Prereq: 110-20 or Biology 110-20 and Chemistry 125-30 or equivalent. Recommended: 110-20; 312; 412; Microbiology 310 or 319; Ornamental Horticulture and Landscape Design (316), and Plant and Soil Science 331.

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

501 Mycology (4) Intensive survey of fungi, all major classes. Lecture, laboratory, and field information. Occasional field trips. Prereq: 310, 3 hrs and 1 lab. Su.A

502 Registration for Use of Facilities (1-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree requirements are met. May be repeated toward degree requirements. May be repeated. S/NC only. E

503 Non-Thesis Research (2) Library, field, or laboratory research under supervision of staff member. Not for thesis candidates. May be repeated. Maximum 4 hrs. E

506 Phycology (4) Comparative study of major algal phyla, both freshwater and marine: morphological, developmental, ecological, taxonomic and phylogenetic aspects. Field and laboratory studies, identification, classification, experimentation. Prereq: 310 or consent of instructor. 3 hrs and 1 lab. F.A

507 Biological Illustration (3) Principles and applications of photography (B/W and Color) photomicrography, drawing, graphics and video for recording and presentation for research and publication of data in pictorial and graphic form.


530 Advanced Taxonomy of Flowering Plants (3) Evolution and classification of families of angiosperms, local flora. Prereq: 330 or equivalent. 2 hrs and 1 lab. F.A

531-32 Special Problems in Botany (1-4, 1-4) May be repeated. Maximum 12 hrs.

544 Seminar in Botany (1) Readings and discussions of current literature and/or selected topics in botanical research. May be repeated. Maximum 8 hrs. S/NC only.

573 Population Biology (3) (Same as Ecology and Evolutionary Biology 573.)

580 Bryophytes and Pteridophytes (4) Taxonomy, phylogeny, ecology and developmental morphology; field studies and current research. Prereq: 330 or consent of instructor. 2 hrs and 2 labs. F.A

582 Methods and Instrumentation in Laboratory Investigation (1) Project experience and theoretical background in various research methods, introduction to the design, execution, and reporting of research. Prereq: 330-20 or consent of instructor. General genetics with grade of B or better and consent of instructor. 2 hrs and 4 labs.

585 Methods and Instrumentation in Field Investigation (1) Appropriate methods and instrumentation. Topics vary. May be repeated with consent of instructor. Maximum 5 hrs. S/NC only.

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


635 Environmental Assessment and Sustainable Development in Trop World Countries (3) (Same as Ecology and Evolutionary Biology 635 and Planning 663.)

662 Seminar in the History of Botany (2) History of botanical exploration and advances from early civilized to modern periods. May be repeated. Maximum 4 hrs.

Broadcasting

(College of Communications)

MAJOR

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

Barbara Moore, Head

Professors:

Holt, Darrel W. (Emeritus.) Ph.D. ...............Northwestern

Howard, Herbet H., Ph.D. ................ Ohio State

Moore, Barbara A., Ph.D. ......Ohio

Swan, Norman R., Ph.D. .................Missouri

Ziegler, Dhyana, Ph.D. ................. Southern Illinois

Assistant Professors:

Bates, Benjamin J., Ph.D. ...................Michigan

Jackson, Evelyn, Ph.D. ..................Ohio State

Wilkinson, Jeffrey, Ph.D. ................. Georgia

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

GRADUATE COURSES

410 Electronic News Gathering (3) Writing, reporting, producing, and performing news for television. Experience as reporter/producer for television news program. Electronic news gathering equipment and techniques, video editing. Prereq: Radio-TV News 1 hr and 4 labs. E


430 Electronic Field Production (3) Principles of video production on location. Concepts relating to message design, development, and production in field: concept development, script writing, shooting graphics, sound design, lighting, and editing. Prereq: Audio/Video Production or consent of instructor. E

440 Corporate Video (3) Special requirements of business, industrial, educational, and medical uses of video. Management, budgeting, planning, producing, and evaluating projects. Prereq: 430 or consent of instructor.


460 Broadcast News Operations (3) Production of news programs for broadcast on television stations. Electronic news gathering, editing and writing news packages and studio production. Prereq: 410 or consent of instructor.

470 Cable Television and Emerging Technologies (3) History and structure of cable television industry. Cable regulations and programming. Entry of telephone companies in distribution video. Analysis of all relevant technological and broadcast satellite, fiber optics cable, high definition television, and others. Prereq: Introduction to Radio and Television or consent of instructor.


490 Radio & Television Management (3) Business policies and practices of broadcast companies, depart-mental function, cost and income analysis, leadership styles and techniques, mid-level management. Cap-stone course to be taken in student's last semester. Prereq: Senior standing. E

500 International Broadcasting (3) Broadcasting systems in other countries. Analysis of international broad-casting organizations. Intercultural communication and international broadcasting. Development of international broadcasting. Prereq: consent of instructor.

560 Radio & Television Law and Regulations (3) Legal problems faced by broadcast managers. Philoso-phy, technology, policy, legislation. Efforts at self-regula-tion, Socio-political restraints, effects of laws and regula-tions, and public pressure on stations, networks, cable and broadcast technologies. Universal connotations of broadcasting among media in terms of regulations. Prereq: Consent of Instructor or admission to program. F

570 Radio & Television Research (3) Various tech-niques used by stations and consultants in broadcast research. Applied audience research. Deciding which method to use, interpreting results, and applying re-
Business Administration

(Office of Graduate Business Programs, Suite 527, Stokely Management Center, College of Business Administration, The University of Tennessee, Knoxville, TN 37996-0592, Telephone: (423) 974-5033. For the executive program, telephone (423) 974-1660.)

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state basis. The Ph.D. in Business Administration is available to residents of Alabama, Florida, or Kentucky (concentration in logistics and transportation only), or West Virginia; the MBA is available to residents of Louisiana (concentration in forest industries management or logistics and transportation), Alabama, Florida or Texas (concentration in logistics and transportation only), Kentucky (concentration in new venture analysis and entrepreneurship or environmental management), Virginia (concentration in environmental management or logistics and transportation), and West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

ACADEMIC STANDARDS

A student in the College of Business Administration whose grade-point average falls below 3.0 will be placed on probation. A student on probation will be dropped from the program unless his/her cumulative grade-point average is 3.0 or higher at the end of the probationary period. The probationary period is defined as the next semester's coursework as established by the degree program.

THE MBA PROGRAM

The MBA program is designed for students with undergraduate degrees in the social and natural sciences, the humanities, and professional fields such as engineering, business, agriculture, and architecture. The MBA program is a two-year program with students beginning in the fall of each year and graduating in the spring, two years hence. During the summer between the first and second year, students must complete an internship with a company using those skills acquired during the first year of the MBA program.

The MBA program consists of a common first-year core and a wide selection of second year elective courses. The first-year core develops a general management foundation upon which specialization is developed in the second year electives. The objective of the program is to develop leaders able to enhance the success of their organizations.

The program consists of two 15-credit-hour MBA core courses in the first year and 24 credit hours of concentration/elective courses in the second. Elective courses carry 3 or 6 semester hours of graduate credit.

Admission Requirements

Applications are accepted for fall semester only. The application deadline for fall semester is March 1. Applications by U.S. citizens and permanent residents received after March 1 will be considered as space allows.

To be considered for admission, the applicant's file must be complete. A complete file includes the Graduate School Application, transcripts of prior college work, the MBA program application, two completed applicant recommendation forms, and the Graduate Management Admission Test (GMAT) score report. The first items should reach The Graduate School one month before the MBA application deadline to allow for processing. Additional information is required by The Graduate School for international students.

For admission to the MBA program, consideration is given to (1) the applicant's academic record with particular attention to the last two years of undergraduate work and previous graduate studies, (2) scores on the GMAT and the Test of English as a Foreign Language (TOEFL) for those whose native language is not English, (3) work experience and other activities that demonstrate potential for leadership, and (4) recommendations from professors and work supervisors. The admission decision is based on all factors which make up the total application; therefore, there is no automatic cut-off for either grade point averages or GMAT scores. However, admission preference will be given to applicants with full-time work experience after obtaining the undergraduate degree.

Prerequisites

College-level mathematics through at least one course in college-level calculus, taken within the past 5 years, with a grade of B or better, is the only prerequisite requirement for entry into the program. Students whose undergraduate training does not include calculus should arrange to take it at UT Knoxville or at another accredited institution prior to the fall semester of entry into the program. Those electing the management science or statistics concentration must have completed two years of college-level calculus.

MBA Core

The MBA core consists of two 15-hour courses, one taken each semester. The courses are taught by the MBA core faculty in an integrated fashion and through a year-long simulation requiring students to learn the functional fundamentals (accounting, finance, management, marketing) when they need to apply them to solving a specific business problem. The topics introduced within this course follow three major themes: the functional fundamentals (learned within a cross-functional framework); the role of the firm in society (with attention to stakeholder value, economics, and the ethical and legal environment of the firm); and personal and team development. Students will be exposed to the assessment and delivery of customer value, statistical process control, continuous systems improvement, and the role of quality in competitive organizations.

Students in the first-year core undertake active learning within a team-based environment. Many core requirements are experiential exercises in which self-discovery within a team setting is an important element of the learning process. Individualized support is provided for developing both written and oral communication skills.

Concentration and Electives

A concentration area may be indicated on the MBA Program Application or this declaration may be deferred until after matriculation. In any event, selection must be made by the end of the first year. Requests for changes in concentration area must be submitted for approval to the Office of Graduate Business Programs.

Among the 24 credit hours in the concentration/electives block, at least 9 but not more than 12 must be in one of the following concentration areas. For specific courses required in concentration areas, see the appropriate field of instruction.

Economics
Environmental Management
Finance
Forest Industries Management
Global Business
Logistics and Transportation
Management
Management Science
Marketing
New Venture Analysis and Entrepreneurship
Statistics

The remaining elective courses must be in fields outside the concentration area, normally selected from MBA courses offered in other departments of the college. Courses outside the College of Business Administration as well as courses listed in the Graduate Catalog numbered below 500 may be included in this block only with written prior permission via
formal petition to the Office of Graduate Business Programs.

Transfer Credits
Graduate level courses taken at other institutions accredited by the American Assembly of Collegiate Schools of Business that otherwise conform to University policy may be credited toward MBA degree requirements within the following limits:

Concentration Area: 3 hours (provided at least 6 hours of work at this institution are included in the concentration area).

Elective Area: 3 hours

Because of the fully integrated nature of the first-year curriculum, no credit hours are transferred into this core curriculum. The maximum number of hours that may be transferred to elective and concentration areas is 6 semester hours. Transfer credit will be considered upon formal petition to the Director of Graduate Business Programs.

Other Requirements
The Application for Admission to Candidacy must be approved by two faculty members and the department head in the student's area of concentration and the Associate Dean in the College of Business Administration. It should be submitted to the Graduate Office at least one full semester prior to the date the degree is conferred. (Admission to candidacy in the fall semester permits graduation in the following spring semester.)

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, and a B average or higher in the overall program. Each student must write a satisfactory analysis of a comprehensive case administered at the end of the first year.

BUSINESS ADMINISTRATION CONCENTRATIONS
For complete listing of MBA program requirements, see above.


In recognition of the growing globalization of business activity and the importance of the international environment to successful management of every firm, the MBA program offers a concentration in global business. The concentration comprises at least two courses taken from Economics 424, Logistics 507, Management 571, and departmental special topics courses with international content; and at least one but not more than two additional courses from the previous list, or from a list of electives as approved by the Director of Graduate Business Programs. Students pursuing a concentration in global business are strongly encouraged to pursue it as a second concentration in addition to one of the traditional departmental concentrations. Students pursuing this concentration are also strongly encouraged to pursue an international or internationally related internship for the summer between their first and second years in the MBA program. Students are expected to participate in a foreign exchange or field experience if at all possible, especially for those with no previous foreign experience. Language training is advised but not required, and beginning language courses are not typically available for graduate credit.

The concentration in new venture analysis and entrepreneurship is comprised of three specifically designed courses which are interdisciplinary in nature. This concentration strives to build a strong academic foundation for both entrepreneurial and intrapreneural activities. The new venture analysis and entrepreneurship concentration is offered in recognition of the growing trend in American business today towards new product/venture development. The new venture analysis/entrepreneurship concentration courses may be combined with two elective courses in another area (management or marketing) to achieve a dual concentration.

Minimum course requirements are Finance 551, Management 551, and Marketing 550. These course descriptions are listed under their fields of instruction.

PRE-MBA PROGRAM
The College offers a joint BA/MBA program with the College of Arts and Sciences. Students in this program take their first three years of coursework in Arts and Sciences, and their last two years in the College of Business Administration. Within their first three years, students fulfill all general education requirements for the BA degree, both upper and lower division along with a minor offered by one of the Arts and Sciences departments. They may use one Economics course only to fulfill distribution requirements, and they are required to take a year of calculus as the only prerequisite to the MBA.

Admission requirements are higher than those normally expected of MBA applicants. Desired qualitative factors include a minimum 3.4 GPA and a GMAT score of 600 or higher.

Students interested in the program are counseled initially in the Arts and Sciences Advising Center regarding admission standards and Arts and Sciences requirements. At the end of their second year, they have a conference with the Director of Graduate Business Programs and are advised of their prospects for formal admission. Students who are likely candidates are advised to take the Graduate Management Admission Test in October of the third year, and to submit an application to the MBA program. The admission decision is made by January of the third year.

Upon admission, students begin MBA coursework in the fourth year and are awarded a BA degree at the end of that year. Upon successful completion of the fifth year (minimum of 50 semester hours of graduate credit), the student receives the MBA degree.

DUAL J.D.-MBA PROGRAM
The College of Business Administration and the College of Law offer a coordinated dual program leading to the conferral of both the Doctor of Jurisprudence and the Master of Business Administration. The dual program saves the student approximately one semester over the time that would be required to earn both degrees independently.

The establishment of the dual program recognizes the increasingly complex body of knowledge necessary to the creative conduct of business and business-related law practice, the complementary nature of many aspects of the graduate programs of the College of Law and the College of Business Administration, and the intellectual benefits inherent in the concurrent study of both business and business-related law. The program is designed to accommodate the interests of students who (a) contemplate a career in public service and want to acquire the skills and perspective of the lawyer and the business-oriented manager, (b) contemplate a career in business management and want to acquire the skills and perspective of a lawyer, or (c) contemplate a career as a lawyer specializing in business-related law and want to acquire the skills and perspective of the business-oriented manager.

Admission Requirements
Applicants for the J.D.-MBA program must make separate applications, and be competitively and independently accepted by, the College of Law for the J.D., The Graduate School and College of Business Administration for the MBA degree, and by the Dual Program Committee. Students who have been accepted by both colleges may apply for approval to pursue the dual program anytime prior to, or after matriculation in either or both colleges. Such approval will be granted, provided that dual program studies be started prior to entry into the last 28 semester hours of J.D. coursework and prior to entry into the second year of the MBA program. Students interested in entering the dual degree program must submit a letter of application to the Dual Program Committee. Upon receipt of the application, the Dual Program Committee will determine eligibility and assign students to advisors who will be responsible for course approval and supervision of the student's progress through the dual program.

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

The College of Law will award up to 9 semester hours of credit toward the J.D. for acceptable performance in approved graduate-level courses offered by the College of Business Administration. The College of Business Administration will award up to 9 semester hours of credit toward the MBA for acceptable performance in approved courses offered in the College of Law. The approval of courses is the responsibility of the Dual Program Committee and the student's assigned advisor.

Students may begin their studies in either the J.D. or the MBA program, but may not enroll in MBA coursework while completing the first year of the law curriculum and may not enroll in J.D. coursework while completing the first year of the business curriculum. During the first year in the J.D. program, students register through the College of Law. For any term in which students take MBA courses, even though they are also taking law courses, they must register through The Graduate School. The Graduate School registration form must be approved by the Director of Graduate Business Programs.

Awarding of Grades
Grades for graduate business courses accepted by the College of Law and grades for law courses accepted by the College of Business Administration will be converted to
either Satisfactory or No Credit and will not be included in the computation of the student's grade average or class standing in the college in which such grades are so converted. The College of Law will award a grade of Satisfactory for a graduate business course in which the student has earned a B grade or higher and a No Credit for any lower grade. The College of Business Administration will award a grade of Satisfactory for a law course in which the student has earned a 2.3 grade or higher and a No Credit for any lower grade. Grades earned in courses of either college may be used on a regular graded basis for any appropriate purpose in the college offering the course. The official academic record of the student maintained by the Registrar of the University shall show the actual grade assigned by the instructor without conversion.

Approved Dual Credit

MBA courses to be counted toward the J.D. program must include 9 semester hours approved by the College of Law. Law courses to be counted toward the MBA must be selected from those approved by the Director of Graduate Business Programs.

EXECUTIVE MBA PROGRAM

The executive MBA is designed for professionals holding middle and upper level positions in organizations that wish to support their attainment of an MBA degree. The objective of the program is to provide advanced management skills to individuals who play key roles in leading their organizations.

The executive MBA is a three consecutive terms completed in one year. Each term requires two residence periods on campus alternating with a continuous program of reading, study, and on-the-job applications off campus. The off-campus work requires substantial and regular contact with program faculty and other participants and includes scheduled assignments to be carried out.

The program consists of three 12-hour core courses and a 9-hour sequence which is a project of diagnosis and analysis of a significant strategic issue in the sponsoring organization.

Admission Requirements

All participants begin and complete the program together in one twelve-month period. Sessions begin in January of each year. Final deadline for applications is October 10 of the preceding calendar year. For applicants who wish to make plans early in the preceding year, there is an advance reservation deadline of August 1. International students and students whose native language is not English must meet special requirements for admission to The Graduate School at UT Knoxville, and they are advised to make inquiries well in advance of the program application deadline.

To be considered for admission, the applicant must have a bachelor's degree and 10 or more years of work experience. Applicants must submit a complete application file including graduate school transcripts, GMAT scores, official transcripts of prior college work, and a letter of recommendation from their employer. The student must submit a complete application file including a GMAT score report. Transcripts from other institutions often take four to six weeks to arrive, so applicants should request these far in advance of the deadline.

For admission to this program, primary consideration is given to the applicant's work history and the recommendation from the sponsoring organization and the GMAT. There is no cut-off for either grade-point averages or GMAT scores, however, admission to the program is competitive, and applicants will be evaluated on their ability to operate on a par with other high achieving participants.

Curriculum

The program is taught by a core faculty of 10 professors assisted by other faculty on an ancillary basis. The core faculty develops the curriculum and teaches in an integrated, interdisciplinary manner.

The MBA program for executives is completed in three terms and requires registration for 15 hours in each term. The first term is comprised of Executive Core I and Management Project I. It includes two residence sessions. The second term is comprised of Executive Core II and Management Project II; it includes two residence sessions the first of which will be in some international venue. The third term is comprised of Executive Core III and Management Project III. It includes two residence sessions.

The core courses are a full-term curriculum with reading and study, case work and problem solving, as well as analyses and applications within the sponsoring organization during the off-campus periods. The topics introduced within these courses follow five major themes: the functional fundamentals (learned within a cross-functional framework); continuous improvement from a systems-thinking perspective; the role of the firm in the global environment; organizational culture and change management; and personal and team development.

The management project is carried out as an independent project with faculty advisor. It involves the diagnosis and analysis of some significant aspect in the sponsoring organization and is based on applying major themes in the core courses. The written project and presentation to senior management and faculty serves as the comprehensive examination.

The off-campus work requires substantial and regular contact with faculty.

Transfer Credits

Because of the integrated nature of the curriculum, no credit hours for courses already taken may be substituted for those in the executive program of the MBA.

Executive MBA in Taiwan

The executive MBA taught in Taipei, Taiwan is designed for professionals residing in Taiwan and other nearby countries. Its target audience and objectives are the same as those on the Knoxville campus. The sequence of material has been changed to accommodate the schedules of faculty teams traveling to Taiwan. The sequence of the MBA in Taiwan results in the same Master of Business Administration degree as the full-time MBA and executive MBA on the Knoxville campus.

The Taiwan executive MBA is three semesters of 16 credit hours each, including the same core and project courses described for the Knoxville program. Between each semester, there is a term when students are not enrolled. The program begins in the Spring term, continues in Spring semester of the following calendar year and is completed in the Fall semester of that same year. All participants begin and complete the program together.

Each semester is comprised of two periods of concentrated class work followed by a continuous program of reading, study and on-line assignments. The class will meet occasionally during the semesters in which they are not enrolled for purposes of discussing the readings and assignments and for assisting one another. The first five periods will be taught in Taiwan. The sixth class period is a three-week residency on the Knoxville campus.

Admissions Requirements for the Executive MBA in Taiwan

To be considered for admission, the applicant must have the equivalent of a U.S. bachelor's degree and 10 or more years of work experience. Applicants must submit a complete application file including the Graduate School application, official transcripts of prior college work, and the executive MBA program application with a recommendation from their company. Admission to the program is competitive. Primary consideration is given to the applicant's work history and the recommendation from the applicant's manager, and applicants will be evaluated on their ability to operate on a par with other high achieving participants.

Each international participant who has not taken the Test of English as a Foreign Language (TOEFL) within the previous two years must take it with a score of 550 or higher. This test may be taken after enrolling in the program but must be successfully completed prior to the international study period in the U.S. To allow for registration, delivery of scores and receipt of the I-20, participants should arrange to take the TOEFL at least 5 months before the international study period.

THE DOCTORAL PROGRAM

The primary objective of the Ph.D. in Business Administration is to prepare a select number of qualified students for careers in university-level teaching and research and for responsible positions in business and government.

Admission Requirements

Students seeking a Ph.D. degree must be recommended for acceptance by the College of Business Administration to The Graduate School. Actual admission is based on the applicant's overall standing compared with other applicants and with the number of vacancies in each department. The Graduate School requires the Graduate School Application, transcripts from all previous college work, and additional information from international students. The college requires the Ph.D. application, scores from the GMAT, and four written recommendations. All materials should be received by the College of Business Administration not later than March 1. Late applications are considered only if space is available.

Under exceptional circumstances, a student may be considered for acceptance into the Ph.D. program without having a master's degree. An applicant in this situation should have an outstanding undergraduate background and should represent a deep and sincere commitment to the pursuit of a career in research and instruction.
Program of Study
The Ph.D. normally requires at least three years of intensive study and research beyond the master’s degree. Typically, the first two years of a student’s program consist of coursework, writing, and research. The third year usually focuses on completion of the dissertation research and writing. It is emphasized that the Ph.D. program of study is structured for full-time students only. Upon acceptance of a student by a particular departmental faculty, the student is expected to remain in residence until the dissertation has been completed and all requirements are met for completion of the Ph.D.

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

The Ph.D. program is highly flexible, offering a wide array of concentrations and cognates. Moreover, heavy emphasis is placed on individualized instruction and close student-faculty interaction. Instruction takes the form of regular classes, doctoral seminars, and independent study and research. Students are also encouraged to attend lectures and discussions by visiting scholars throughout the year.

There are six concentrations offered in the Ph.D. program:

- Accounting
- Finance
- Logistics and Transportation Management (Operations Management and Strategic Management)
- Marketing
- Statistics
- More detailed information concerning these specific areas is available by writing directly to the business department chairperson in a student’s intended area of concentration, subject to the Graduate Council’s policies and procedures. Following are specific degree requirements.

Degree Requirements
Doctoral students must file a program of study that has been approved by their doctoral committee within one year of completing their first year of doctoral studies. This committee is nominated by the department chairperson in a student’s intended area of concentration, subject to the Graduate Council’s policies and procedures. Following are specific degree requirements:

1. Students must complete at least three years of full-time coursework beyond the baccalaureate degree, with two years of residence on the Knoxville campus.
2. Students are required to have a sound and broad base on which to build their Ph.D. coursework. The departmental doctoral advisor will work with the student to determine what, if any, courses need to be completed. All such work is subject to approval by the temporary doctoral advisory committee and the Director of Graduate Business Programs. Specific concentrations may have prerequisites.
3. Research Tools: A minimum of 9 semester hours of coursework is required. At least 3 seminar hours in statistics courses beyond Statistics 531 are required. The remaining 3 semester hours may be completed in additional statistics courses (not to include Statistics 531) or in other areas such as research methodology, management science, computer science, econometrics, and psychometrics.
4. Concentrations: The concentration is the focal point of the Ph.D. program. Students are expected to master the literature and research techniques in the concentration area and to do quality research as evidenced by the preparation of an acceptable dissertation. A minimum of 12 semester hours of coursework is required, including at least 9 hours of doctoral seminars. Graduate work taken in the concentration at other institutions is considered by the temporary doctoral advisory committee in approving the specific coursework required. Available concentrations are: accounting, finance, logistics/transportation, management (operations management and strategic management), marketing, and statistics. See the appropriate fields of instruction for specific course requirements.
5. A minimum of 9 semester hours of graduate coursework is required in an area outside, but complementary to, the concentration. The student may choose the cognate from one of the following: one of the six concentration business areas listed above, economics, or a related area in another school or college of the University.

Comprehensive Examinations
Comprehensive written examinations over the concentration area are required of each person seeking candidacy for the Ph.D. degree. This examination is administered in two one-week sessions of approximately four hours each. Students qualify in the cognate area by completing a one-week, four-hour examination or an equivalent jointly approved by the student’s major professor and the student’s advisor in the cognate area. Comprehensive examinations are generally offered during the fall and spring terms. Comprehensive examinations must be taken within five years of matriculation.

When either the concentration or cognate area examination is passed, the remaining examination must be passed within the next 12 months.

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

Admission to Candidacy
Students may apply for admission to candidacy for the Ph.D. after maintaining at least a “B” average in coursework, successful completion of comprehensive examinations, and acceptance of a research proposal for the dissertation submitted to the student’s doctoral committee. Admission to candidacy must be approved at least one full semester prior to the date the degree is conferred. (Admission in the fall permits graduation in the following spring semester.)

Application for admission to candidacy must include a listing of all courses taken in each of the fields required for the degree (business functional areas, basic disciplines, concentration and cognate area). Graduate courses accepted from other institutions must be included. Under "Other Requirements," the date of acceptance of the research proposal by the doctoral committee should be indicated. The application must be approved by the student’s doctoral committee and the Associate Dean before submission to the Graduate School.

Dissertation
Minimum of 24 semester hours: The student must complete a dissertation embodying the results of original research demonstrating the ability to do scholarly writing. The dissertation is examined by the student’s doctoral committee, which must certify its completion and acceptability after oral defense of the candidate’s research effort.

The dissertation normally must be completed within three years of the student’s advancement to candidacy.

GRADUATE COURSES

504 Core I (15) Development of roles and responsibilities of business manager. Functional fundamentals (accounting, finance, marketing, operations, human resource management) through year-long case in which knowledge is applied to solution of simulated real-world enterprise. Continuous improvement and delivery of customer value: role of firm in society (with attention to stakeholder value, economics, and the ethical and legal environment of firm). Personal leadership skills: team-building, written and oral communication, and assessment of students’ leadership abilities. Pre-req: 504 or consent of Director of Graduate Business Programs.

505 Core II (15) Continuation of 504. Functional fundamentals through year-long case. Case-study work on organizational structure, strategy, technology, ethics and social responsibility, and strategic planning. Capstone integrated business simulation. Pre-req: 504 or consent of Director of Graduate Business Programs.

506 Information Engineering and Management (3) Design and management of information necessary to accomplish organizational objectives using activity blueprints, entity-relationship diagrams, data base design principles, view diagrams and ICASE (Computer-Aided Software Engineering) tools.

510 Management of Innovative Service Organizations (3) Management of organizations which respond to customer requests rather than to produce inventory. Non-economic functions, service management, relationship building and management methods built on enabling, empowering, monitoring and mentoring employees to diagnose and respond to individual customer needs.

551 Executive Core I (12) Integrated semester course: two 11-day periods in residence with substantial reading, study and analyses during off-site periods. Integration of major business functions through strategic perspective, application of functional knowledge to tactical and strategic issues. Role of firm in society as it relates to economic/legal environment and development of purpose of firm as delivering value to customers and other stakeholders. Pre-req: 504 or consent of Director of Graduate Business Programs.


553 Executive Core III (12) Course designed for executive continuing education for mid-level and upper management. Pre-req: 551. One 11-day period and one two-week period of residence at...
Graduate programs lead to the degrees of Master of Science and Doctor of Philosophy in Chemical Engineering with concentrations in chemical engineering, chemical bioengineering, advanced control systems, and polymer science and engineering.

THE MASTER'S PROGRAM

Thesis Option: The standard master's program includes a thesis and leads to the Master of Science. Minimum departmental requirements are as follows:

1. A total of at least 21 hours in graduate coursework in chemical engineering and related areas excluding the thesis. The minimum requirements are 15 hours in chemical engineering; 3 hours in other engineering, scientific, or business areas (as approved by the departmental faculty); and 3 hours chosen from either of these two categories.
3. Active participation in graduate seminars in the department. Resident students must register for Che 501 every semester it is offered.
4. A final oral examination covering the thesis, related fields and graduate coursework.

Non-Thesis Option: Under certain conditions, a candidate may apply for a non-thesis program. To be eligible, a candidate must show evidence of significant professional experience after the baccalaureate degree; at least five years of industrial experience or research publications would be examples of such evidence. The departmental faculty will consider each application individually. Upon acceptance, the requirements for completion of the non-thesis option are as follows:

1. A total of at least 33 hours in graduate courses in chemical engineering and related areas. The minimum requirements are 18 hours in chemical engineering; 6 hours in other engineering, scientific, or business areas (as approved by the departmental faculty); and 9 hours chosen from either of these two categories.
2. Completion of a critical review of the literature and other sources in an area related to chemical engineering (CHE 580).
3. A written comprehensive examination covering the major field and an oral examination covering the review paper and related areas.

THE DOCTORAL PROGRAM

Students applying for entrance into the doctoral program must submit evidence of ability to perform and report independent research to the satisfaction of the department. The master's thesis may be offered as such evidence.

Department requirements consist of the satisfaction of the following:

1. Graduate courses in chemical engineering, amounting to approximately 24 semester hours, at least 9 of which must be in 600 series courses.
2. Supporting courses in related scientific and engineering fields amounting to approximately 24 semester hours, subject to approval by the student's faculty committee. These related fields will normally include chemistry, mathematics, physics, and engineering.
3. The comprehensive examination, consisting of a written part and an oral part. The written part covers thermodynamics, reactor analysis, and transport phenomena and separations.
4. Active participation in graduate seminars conducted by the department. Resident students must register for CHE 501 every semester it is offered.

GRADUATE COURSES

403 Introduction to Optimization (3) Principles and applications of optimization techniques to chemical process design; unconstrained and equality constrained optimizations, linear programming, dynamic programming, and geometric programming. Prereq: Mathematics 241.
447 Honors: Transport Phenomena (3) Momentum, heat and mass transfer processes, analogies, differential and macroscopic balances, applications involving molecular diffusion, simultaneous mass, heat and chemical reaction. Prereq: Mass Transfer and Separation Processes and consent of instructor. F
461 Advanced Process Dynamics and Control (3) Process and control system simulation and advanced industrial system design. Cascade, feedback, multi-variable, deadtime, and nonlinear control system design. Both computer and laboratory. Lab. Prereq: Che 360.
500 Thesis (1-15) P/NP only. E
501 Graduate Seminar (1) Prereq: Admission to graduate program. May be repeated. S/NP only. F, Sp
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester. The student uses University facilities according to his/her faculty before degree is completed. May not be used toward degree requirements. May be repeated. S/NP only. E
505 Engineering Analysis (3) Formulation and solution of problems in chemical engineering and materials areas, ordinary and partial differential equations; types of ODE, PDE and solution techniques; transform methods; conformal mapping; variational methods; introduction to numerical methods. (Same as Materials Science and Engineering 505.)
507 Application of Numeric Linear Algebra in Systems and Control Engineering (3) Fundamental concepts of linear algebra to problems in systems and control areas. Geometric and physical interpretations of relevant concepts; least square problems, LU, QR, and SVD decompositions of matrices, eigenvalue problems and similarity transformations in solving difference and differential equations. Numerical computational aspects of various algorithms. Application of linear algebra concepts in optimization studies. Introduction to linear programming. Computer projects. Prereq: Graduate standing or consent of instructor. (Same as Electrical Engineering 507 and Mechanical Engineering 507.)
531 Advanced Chemical Engineering Thermodynamics (3) Phase equilibria in ideal and nonideal solution; composition relationship between phases, solution behavior and applications to macromolecules; introduction to microscopic approach to thermodynamics.
Chemistry

(College of Arts and Sciences)

MAJOR
Chemistry.......................................................... M.S., Ph.D.

William Bull, Acting Head

Professors:

Adcock, J. L., Ph.D. ........................................ Texas
Aldrich, T. W., Ph.D. ....................................... Colorado
Alexandratos, S. D., Ph.D. .................................. California
Baker, D. C., Ph.D. ............................................ Ohio State
Barth, J. E., Ph.D. ............................................. Northwestern
Bloor, J. E. (Emeritus), Ph.D. ................................. Illinois
Bull, W. E., Ph.D. ............................................... Kansas
Chambers, J. Q., Ph.D. ......................................... Illinois
Compton, R. N., Ph.D. ......................................... Illinois
Dean, J. A. (Emeritus), Ph.D. ................................. Michigan
Eastham, J. F. (Emeritus), Ph.D. .............................. Minnesota
Fleming, F. A., Ph.D. ........................................... Cornell
Globoch, G. (Distinguished Scientist), Ph.D. ............ Illinois
Kabalka, G. W. (Distinguished Prof.), Ph.D. ............... Purdue
Kleinfeilder, D. C., Ph.D. ...................................... Princeton
Kovac, J. D., Ph.D. .............................................. Illinois
Lietzke, M. H. (Emeritus), Ph.D. ............................. Wisconsin
Magli, L. J., Ph.D. .............................................. Illinois
Magli, R. M., Ph.D. .............................................. Illinois
Pagni, R. M., Ph.D. .............................................. Illinois
Palsner, R. J., Ph.D. ............................................. California
Schwartz, G. K. (Distinguished Prof.), Ph.D. .......... Illinois
Sepaniak, M. J., Ph.D. .......................................... Iowa State
Smith, W. T. (Emeritus), Ph.D. ................................. Ohio State
Vanhook, W. A., Ph.D. ....................................... Illinois
Wehr, E. L. (Emeritus), Ph.D. ................................. California
Williams, T. F. (Distinguished Prof.), Ph.D. ................ Washington
Wood, C. Ph.D. ..................................................... Illinois
Wumberger, D. (Distinguished Scientist), Ph.D. ....... Northwestern

Associate Professors:

Barnes, C. E., Ph.D. ............................................ Stanford
Feigler, C. S. (Liaison), Ph.D. ................................. Colorado
Lane, C. A., Ph.D. .................................................. California
Schell, F. M., Ph.D. ............................................. Indiana

Assistant Professor:

Dadmun, M. D., Ph.D. ........................................ Massachusetts
Hinde, Robert J., Ph.D. ......................................... Chicago
Xue, Z. B., Ph.D. .................................................. California

THE MASTER'S PROGRAM

The department offers concentrations in six areas for the M.S.: analytical chemistry, environmental chemistry, organic chemistry, polymer chemistry, and physical chemistry.

The requirements for the M.S. in Chemistry consist of the satisfactory completion of:

1. Research and a thesis to give 6 to 12 hours of graduate credit in Chemistry 675.

2. Participation in seminar (Chemistry 501) during the entire period of graduate study, including the presentation of at least one seminar. (No more than 2 hours may be applied to the course requirements.)

3. Prescribed remedial courses based on performance on entrance examinations.

4. Sufficient graduate coursework in chemistry (at the 400 level or above) and/or a related field to make an overall total of 30 hours, including one of the following sequences: 530-51-52, 570-72-73, 590-84-95, or three courses from 510-11-12-20. At least 14 hours of this graduate coursework must be at the 500 level or above.

5. A final oral examination.

THE DOCTORAL PROGRAM

The department offers concentrations in eight areas for the Ph.D.: analytical chemistry, chemical physics, inorganic chemistry, organic chemistry, polymer chemistry, and theoretical chemistry.

The requirements for the Ph.D. in Chemistry (except for the chemical physics concentration) consist of the satisfactory completion of:

1. Research and a dissertation to give at least 24 hours of graduate credit in Chemistry 600. Registration must be continuous from the beginning of the research.

2. Participation in seminar (Chemistry 501) during the entire period of graduate study, including the presentation of at least one seminar.

3. Prescribed remedial courses based on performance on entrance examinations.

4. Completion of the comprehensive examination series and defense of an original research proposal to give 2 hours of credit in Chemistry 601.

5. Eighteen additional hours in courses at the 500 level or above including at least one course above 601 and one of the following sequences: 510-11-12, 530-31-32, 550-51-52-53-54, 570-71-72-73, and 590-64-95.

6. A final oral examination.

The Ph.D. program with concentration in chemical physics is conducted jointly with the Department of Physics. Requirements depend on the choice of the major department.

Chemical departmental requirements include the following: 601-62-63-64-65-66-67-68, 690-90-91-92-93-94-95. At least 24 hours of graduate credit in Chemistry 600. Registration must be continuous from the beginning of the research.

7. Eighteen additional hours in courses at the 500 level or above including at least one course above 601 and one of the following sequences: 510-11-12, 530-31-32, 550-51-52-53-54, 570-71-72-73, and 590-64-95.

8. A final oral examination.

The Ph.D. program with concentration in chemical physics is conducted jointly with the Department of Physics. Requirements depend on the choice of the major department.

Chemical departmental requirements include the following: 601-62-63-64-65-66-67-68, 690-90-91-92-93-94-95. At least 24 hours of graduate credit in Chemistry 600. Registration must be continuous from the beginning of the research.

9. Eighteen additional hours in courses at the 500 level or above including at least one course above 601 and one of the following sequences: 510-11-12, 530-31-32, 550-51-52-53-54, 570-71-72-73, and 590-64-95.

10. A final oral examination.

The Ph.D. program with concentration in chemical physics is conducted jointly with the Department of Physics. Requirements depend on the choice of the major department.

Chemical departmental requirements include the following: 601-62-63-64-65-66-67-68, 690-90-91-92-93-94-95. At least 24 hours of graduate credit in Chemistry 600. Registration must be continuous from the beginning of the research.

11. Eighteen additional hours in courses at the 500 level or above including at least one course above 601 and one of the following sequences: 510-11-12, 530-31-32, 550-51-52-53-54, 570-71-72-73, and 590-64-95.

12. A final oral examination.

The Ph.D. program with concentration in chemical physics is conducted jointly with the Department of Physics. Requirements depend on the choice of the major department.

Chemical departmental requirements include the following: 601-62-63-64-65-66-67-68, 690-90-91-92-93-94-95. At least 24 hours of graduate credit in Chemistry 600. Registration must be continuous from the beginning of the research.

13. Eighteen additional hours in courses at the 500 level or above including at least one course above 601 and one of the following sequences: 510-11-12, 530-31-32, 550-51-52-53-54, 570-71-72-73, and 590-64-95.

The M.S. with a concentration in child development offers two tracks. Track 1 is designed to meet the needs of professionals who work in programs encompassing a variety of early childhood settings. Specializations in Track 1 consist of early childhood education, early childhood special education, early childhood administration and child development. Track 2 is designed for students seeking initial teacher licensure in early childhood education (pre-K through grade 2). Thesis and non-thesis options are available for both tracks.

Track 1 - All students in the child development concentration must enroll in CFS 510, 540, and 571. At least 6 hours in a cognate area outside the department must be completed. Thesis students are required to take: 3 hours of 500-level research methods; 3 hours of 500-level statistics; 6 hours of CFS courses in the area of concentration; 6 hours of thesis credit; and an oral comprehensive examination. Non-thesis students are required to take 3 hours of 500-level research methods, statistical methods, or interpretation of methods and statistics; CFS 564, 565; 9 hours of CFS courses in the area of concentration; and a written comprehensive examination.

Track 2 - All students in the early childhood education licensure program must enroll in Human Ecology 534, 575, 591, and Holistic Teaching/Leaning 505 (or equivalent CFS course). Thesis students are required to take: CFS 510 or 512; 3 hours of 500-level statistics; 3 hours of 500-level research methods; two courses selected from CFS 520, 521, 522, 530, 540, 525, 590; 6 hours of thesis credit; and an oral comprehensive examination (45 hours). Non-thesis students are required to take: CFS 510 or 512; three courses selected from CFS 520, 521, 522, 530, 540, 525, 590; 3 hours of 500-level statistical methods or interpretation of statistics and research methods; and a written comprehensive examination (39 hours).

Students in the early childhood education licensure program may choose to complete their M.S. degree requirements with a major in Child and Family Studies or Human Ecology.

The family studies concentration consists of specialized training in family life intervention and family science. Thesis and non-thesis options are available in both concentrations. Students should also consider an interdisciplinary minor in gerontology to provide a life span perspective to human development or family studies.

Students in the family studies concentration must enroll in CFS 550, 571, and 540 or 560. At least 6 hours in a cognate area outside the department are required. Thesis students are required to take: 3 hours of 500-level research methods; 3 hours of 500-level statistics; 6 hours of CFS courses in an area of concentration; 6 hours of thesis credit; and an oral comprehensive examination. Non-thesis students are required to take: 3 hours of 500-level research methods, statistical methods, or interpretation of methods and statistics; CFS 564, 565; 9 hours of CFS courses in the area of concentration; and a written comprehensive examination.

Students Matriculating with a major in Child and Family Studies are required to file a plan of study with the department head after 15 hours of graduate credit have been completed.

THE PH.D. CONCENTRATION

The doctoral program in Human Ecology prepares scholars in the concentration areas of child development and of family studies. The strength of the doctoral program is based on three major components: the integration of child development and family studies within the context of human ecology and related areas, concentration in child development or family studies, and an emphasis on becoming proficient producers and consumers of research. A doctoral program that is concurrently specialized and integrative in nature reflects the complexity of the disciplinary subject matter, provides a broader context to formulate theoretical questions, and broadens the empirical literature for addressing those questions.

Requirements include:
1. Minimum 10-13 credits in child and family studies required foundation courses: 510, 550, 570, 571 and 630 (child development area) or 534 (family studies area).
2. Minimum 12 credits in 500- and 600-level courses in child development or family studies, with at least 3 credits in 600-level courses (in addition to the required courses described in #1).
3. Minimum 6 credits in a cognate area.
4. Minimum 9 credits in graduate-level statistics; with at least 3 of those credits in a more specialized area than a sequence of survey courses.
5. Minimum 3 credits of specialized research methods.
6. Pre-doctoral research project approved by student's committee.
8. Minimum 8 credits of electives.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state basis. The M.S. in Child and Family Studies (concentration in family studies only) is available to residents of Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

500 Thesis (1-15) P/NP only. E
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student 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
505 Development of Interpersonal and Supervision Skills (2) Refinement of interpersonal skills needed to work with families and other professionals. Supervisory training in others' skill development, active listening, self-disclosure, relationship building, and negotiation. Prereq: CFS 510, 563.)
510 Survey of Theory and Research in Child Development (3) Theoretical models and research literature in child development (conception through adolescence); application to research intervention and education. Prereq: 9 hrs of either upper division undergraduate or graduate social science or consent of instructor. F
512 Survey of Research in Early Childhood Education (3) Current literature and issues in early childhood education. Prereq: 510 or equivalent or consent of instructor.
515 Children in Contemporary Society (3) Theory and research in environmental and developmental issues in contemporary family situations and educational environments for children from infancy through middle childhood. Implications for programs and policy.
Civil and Environmental Engineering

(Majors in Engineering)

DEGREES

Civil Engineering
Environmental Engineering
M.S., Ph.D.
M.S.
(Ph.D. through Civil Engineering)

Gregory D. Reed, Head

Professors:

Bennett, R. M., Ph.D., Illinois
Burdette, E. G. (Fred N. Peabody Prof.), Ph.D., Illinois
Chatterjee, A., Ph.D., NC State
Davis, W. T., Ph.D., Tennessee
Deatherage, J. H., Ph.D., Tennessee
Drumm, E. C., Ph.D., Arizona
Ghosh, M. (Goodrich Chair of Excellence), Ph.D., Illinois
Goodpasture, D. W., Ph.D., Illinois
Greco, W. L. (Emeritus), Ph.D., Michigan State
Heathington, K. W. (Emeritus), Ph.D., Northwestern
Humphreys, J. B. (Emeritus), Ph.D., Texas A&M
Johnson, H. L. (Emeritus), M.S., Tennessee
Miller, W. A. (Granger Prof.), Ph.D., Georgia Tech
Reed, G. D. (Liaison), Ph.D., Arkansas
Robinson, R. B. (Fisher Prof.), Ph.D., Iowa State
Smoot, J. L., Ph.D., VPI
Tschantz, B. A. (Condra Prof.), Ph.D.
St. D., New Mexico State
Walker, C. R. (Emeritus), M.S., MIT
Wegmann, F. J., Ph.D., Northwestern

Associate Professors:

Chou, K. G., Ph.D., Northwestern
Hansen, J. H. (UTSI), Ph.D., Missouri
Miller, T. L., Ph.D., Tennessee
Moore, A. B., M.S., Tennessee
Richards, S. H., Ph.D., Tennessee
Robinson, K. G., Ph.D., VPI
Tiry, R. F. (Emeritus), B.S., Marquette

Assistant Professors:

Cox, C. D., Ph.D., Pennsylvania State
Han, L. D., Ph.D., California
Mauldon, M., Ph.D., California

The Department of Civil and Environmental Engineering offers degrees leading to the Master of Science and Doctor of Philosophy with a major in Civil Engineering and Environmental Engineering in construction, environmental engineering, geotechnical and materials engineering, public works engineering, structural and transportation engineering; to the Master of Science in Environmental Engineering with concentrations in water quality, air quality, waste management, and environmental engineering.

The Masters' Program

The Master of Science programs in Civil Engineering and Environmental Engineering are offered to graduates of recognized undergraduate curricula.

Departmental requirements provide for a major in Civil Engineering, the Bachelor's degree must be in civil engineering, and certain undergraduate prerequisite courses must be taken before admission to candidacy for the Master of Science in Civil Engineering.

Civil Engineering

The Department of Civil and Environmental Engineering offers three options for the Master of Science degree in Civil Engineering:

Thesis Option: A minimum of 30 semester hours, including 6 hours of thesis, is required.
Non-Thesis Option: A minimum of 33 semester hours, including a 4-hour special problems course, is required.

Environmental Engineering

For a student with a major in Environmental Engineering, a Bachelor's degree in a field of environmental engineering is required. For a student who does not have an environmental engineering background, the following minimum prerequisite courses will be required:

Basic Engineering and Computer Science 101; Basic Engineering 121, 131, 201; Mechanical Engineering 231; Statistics 251; Civil Engineering 308, 390, 391, 392; Mathematics 141, 142, 213; Chemistry 120, 130. In general, these must be completed with a B average before courses for graduate credit can be taken.

The Department of Civil and Environmental Engineering offers both thesis and non-thesis options for work toward the Master of Science degree in Environmental Engineering. The Thesis Option: The student must present a minimum of 30 semester hours of approved graduate courses. The major shall include a minimum of 12 semester hours of approved environmental engineering coursework. A minor may be selected but is not necessarily required.

Non-Thesis Option: The student must present a minimum of 33 semester hours of approved graduate courses. The major shall include a minimum of 18 semester hours of approved environmental engineering coursework. A minor may be selected but is not necessarily required.

Either option must be approved by the student's major professor. A student's program must include a minimum of 9 semester hours of advanced engineering design courses selected from a list provided by the student's committee.

The Doctoral Program

A graduate program leading to the Doctor of Philosophy is offered in Civil Engineering. Specific departmental requirements for the Ph.D. degree include the following:

1. A minimum of 72 semester hours beyond the Bachelor's degree, exclusive of credit for the M.S. thesis. Of this number, a minimum of 24 semester hours in 600 Doctoral Research and Dissertation will be required.
2. A minimum of 24 semester hours of graduate courses in civil engineering, exclusive of dissertation credit, at least 6 hours of which must be 600-level courses.
3. Supporting courses in related scientific and engineering fields, amounting to approximately 24 semester hours, subject to approval by the student's faculty committee. These related fields will normally include such disciplines as mechanics, chemistry, mathematics, microbiology, physics, and other engineering fields. A minimum of 9 semester hours of mathematics will be required beyond the civil engineering undergraduate requirements.

4. One foreign language if the student’s faculty committee feels that a reading knowledge of a foreign language is crucial to the student's research efforts.

5. Upon completion of at least one-half of all coursework, each student must pass a comprehensive examination.

6. After completion of the dissertation, prior to graduation, each student must pass a comprehensive examination administered by a faculty committee.

MINOR IN ENVIRONMENTAL POLICY

The department participates in a program designed to give master's level graduate students an opportunity to develop an interdisciplinary specialization in environmental policy. See Economics for program description.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The M.S. program in Environmental Engineering (concentration in in air quality or waste management) is available to residents of the state of Alabama. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

Civil Engineering

GRADUATE COURSES

406 Legal and Ethical Aspects of Engineering (2) Legal principles underlying engineering work; laws of contracts, torts, real property; problems of professional registration and ethics; conflict of interest.

421 Portland Cement and Asphallic Concrete (3) Aggregate properties and tests, tests of portland cement concrete, mix design methods for concrete and asphalt, concrete admixtures, tests of asphalt and asphalt mixes, and nondestructive testing. Prereq: 321. 2 hrs and 1 lab.

451 Highway Engineering (3) Design, construction, operation, and maintenance of highway facilities; application of various engineering principles and techniques to process of planning, locating and design of highway facilities; both geometric and pavement design. Prereq: 210, 252, 352.

452 Traffic Engineering (3) Characteristics of driver, vehicle, and roadway and their interrelationship; traffic studies; basic considerations of traffic circulation and control; lighting, capacity analysis, roadway safety analysis and design. Prereq: 210, 251, 352.

453 Airport/Railroad Planning and Design (3) Airport master planning and railroad engineering. Runway configuration, airfield capacity, geometry and terminal layout and design. Railroad capacity, geometrics and systems layout and design. Prereq: 210, 251, 352.

461 Analysis of Framed Structures (3) Maximum stress due to moving loads; use of influence lines; lateral forces due to earthquake; analysis of portals, building frames, and frame structures; matrix methods; use of computer in structural analysis. Prereq: Structural Analysis II.

472 Steel Design (3) Design of plate girders and composite beams; consideration of members subjected to combined stresses; design of typical framed building connections. Prereq: 271.

474 Reinforced Concrete Design (3) Reinforced concrete continuous beams and floor slabs, columns with combined axial loads and bending, footings and retaining walls. Prereq: 471.

485 Principles of Hydrogeology (3) Same as Geology Sciences 465.

490 Water Resources Project Design (3) Coherent development of multipurpose study, including dam project data acquisition; spillways and outlet works design; analysis and gravity dam stability analysis; drains and filters; maintenance and control of reservoirs; and safety concepts; dam break analyses. Prereq: 390, 395.

494 Urban Drainage Engineering (3) Design and management ofstormwater conveyance and control structures. Application of hydrologic and hydraulic principles to design of drainage system for urban, strip mining, and highway development; design of inlet structures, ditches, culverts, and detention/retention basins; application of commonly used computer runoff models; evaluation of use on streamflow quantity and quality. Prereq: 390, 395.

495 Water Resources Development and Management (3) Principles of water resources project development planning and structural framework; water law, evaluation procedures for selecting and among water resources development alternatives, multi-objective planning, principles of engineering economics, cost-benefit analysis, and cost allocation methods; environmental impact assessment procedures; decisions using risk-based methods; case studies. Prereq: Senior standing.

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

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

510 Urban Systems: Engineering and Management (3) Various urban systems usually under responsibility of city manager and/or city engineer: streets, lighting, water, sewerage, refuse collection. Personnel management, finance, planning and public relations. Prereq: Graduate standing or consent of instructor.


531 Soil Stabilization (3) Mechanical stabilization of soils by compaction, drainage, and blending; chemical stabilization of soils with admixtures, waterproofing and modifying soils and improving drainage. Reinforced earth and stabilization with geosynthetics. Prereq: Introduction to Soil Behavior.

532 Rock Mechanics and Rock Engineering (3) Engineering principles of rock mechanics and rock masses. Discontinuity analysis, stress and strain, keyblock theory. Applications to rock slopes, underground excavations, foundations and groundwater flow. Prereq: Introduction to Soil Behavior or consent of instructor.


537 Issues in Geotechnical Engineering (1-3) Special readings, problems, discussions, and presentations in geotechnical engineering. Prereq: Graduate standing or consent of instructor. May be repeated.

538 Finite Element Applications in Geotechnical Engineering (3) Applications of finite element method to problems in geotechnical engineering. Constrained and unconstrained flow through porous media; stresses and strains in elastic halfspace; representation of nonlinear soil behavior with elastic and elastic-plastic models; soil structure interaction effects. Prereq: Introduction to Soil Behavior and 561.

539 Geotechnology Seminar (1) Seminar topics in geotechnical and geological engineering. Research contributions and case histories by graduate students and engineering faculty. Prereq: Graduate standing and consent of advisor. May not apply toward degree. May be repeated. S/NC only.

540 Construction Management I (3) Management and organization of heavy and building construction projects. Prereq: Construction Methods and Equipment.

541 Construction Management II (3) Management and organization of heavy and building construction projects. Prereq: Construction Methods and Equipment.

543 Construction Estimating (3) Project costs, estimating and takeoff techniques, market cost conditions, and feasibility of design to cost. Prereq: Construction Methods and Equipment.

551 Traffic Engineering-Characteristics (3) Driver-vehicle-traffic systems; traffic flow modeling; elements of transportation/hairstream flows; pavement design. Prereq: Graduate standing.

552 Traffic Engineering-Operations (3) Signs, signals and operations; short-term operations; controllers; signal timing and phasing; one-way reversible flow; system operations; identification and correction of high-accident locations and system deficiencies. Prereq: 551 or 542.

553 Geometric Design and Layout of Roadways and Communities (3) Functional and geometric design and rural and urban roads of all classes; subdivision layout; configuration of urban roads of all classes;tecchniques for access control; freeway interchanges and street intersections; and parking. Prereq: 451 or consent of instructor.

554 Urban Transportation Planning (3) Transportation problems in urban areas; systematic planning for identifying existing and future problems; travel surveys and demand models; evaluation of alternatives; implementation tools; special topic: urban goods movement transportation system management. Prereq: 352 or graduate standing.

555 Public Transit Planning (3) Characteristics of transit modes—conventional and paratransit; operational design of transit services; route planning and scheduling; demand analysis; mode choice; analysis of transit usage; transit surveys; organization and financing. Prereq: 554 or graduate standing.

556 Traffic Accident Reconstruction (3) Data collection and analysis as basis for accident prevention on control programs; roadway hardware design and crash testing. Prereq: 452 or graduate standing.

557 Transportation Planning and Operations with Micro-Computer Applications (3) Transportation system management techniques and application of micro-computer in analysis of transportation actions. Prereq: 551 and 556.

558 Planning and Transportation (3) Preparation of transportation as elements of comprehensive development plans. Analysis of relationship between various transportation modes and their interaction with other community features. Use of planning process to establish existing travel patterns, modeling of demand, proposing alternatives and evaluation. Prereq: Graduate standing. (Same as Planning 537.)

561 Computer-Aided Structural Analysis (3) Fundamental concepts of computational methods used in structural analysis; matrix and finite element methods; practical applications of computer-aided structural analysis. Prereq: Structural Analysis and Matrix Computation or equivalent.

562 Statistically Indeterminate Structures (3) Deflections of beams and trusses, force methods; moment distribution and other displacement methods; secondary stresses. Prereq: 361.
565 Structural Dynamics (3) Analysis of free and forced vibrations, and transient response of structures having many degrees of freedom; elastoplastic behavior considered for structural and earthquake design and response of structures. Prereq: 561.

567 Structural Systems (3) Structural system analysis and design; dead, live, wind, and earthquake loads on buildings; vertical and lateral load resisting systems; use of computers in analysis and design. Prereq: Introduction to Structural Design.

571 Behavior of Steel Structures (3) Behavior of structural steel members due to static and fatigue loading; relation between research results and current specifications for design. Prereq: 572.

572 Connections for Structural Steel Frames (3) Design, analysis, and behavior of connections for structural steel frames. Simple, rigid and semi-rigid connections; column bases and column splices. Prereq: 472.

573 Prestressed Concrete (3) Properties of prestressing materials; methods of prestressing and posttensioning; analysis and design of simple and continuous beams and slabs. Prereq: 471.

574 Behavior of Reinforced Concrete Members (3) Moment-curvature and load-deflection relationships for reinforced concrete beams; bending and axial load; shear and torsion; relation between research results and specifications for design. Prereq: 471.

575 Repair and Retrofitting of Structures (3) Techniques, methods, and materials for repair and retrofitting of deteriorated or overstressed structures, foundation underpinning, retrofitting of steel failure. Prereq: 472.

576 Masonry Design (3) Clay and concrete masonry materials; reinforced masonry design; reinforced masonry design; seismic behavior of masonry structures. Prereq: Introduction to Structural Design.

580 Risk Analysis in Civil and Environmental Engineering (3) Applications of probability theory and statistics in civil engineering disciplines; structures, geotechnical, water resources, erosion and sedimentation, and environmental engineering. Prereq: Calculus II or consent of instructor.

588 Measurement Science I (3) Same as Nuclear Engineering 588, Mechanical and Aerospace Engineering 588, and Aviation Systems 586.

590 Special Problems in Civil Engineering (1-6) Enrollment limited to civil engineering students in nonthesis programs. May be repeated. Maximum 8 hrs. S/NC only.

595 Special Topics (1-4) Problems and topics related to current developments in field. May be repeated. Prereq: Consent of instructor.

596 Special Readings (1-4) Readings related to current development in field. May be repeated.

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

651 Analysis Techniques for Transportation Systems I (3) Analysis of trip generation, trip distribution, modal split and traffic assignment, employing mathematical, statistical, and computer science techniques. State of the art and new modeling techniques. Prereq: 654 or 558.

652 Analysis Techniques for Transportation Systems II (3) Advanced topics of application of mathematical, statistical, and computer science techniques in modeling and analysis of transportation systems. Prereq: 651.

656 Reliability of Constructed Systems (3) Development of reliability-based design codes; Monte Carlo methods; constructed system reliability; evaluation of existing infrastructures. Prereq: 580. Introduction to Structural Design or consent of instructor.

671 Behavior of Steel Bridges and Buildings (3) Behavior, analysis and design of plate girders, columns, and composite members subjected to static and dynamic loading. Prereq: 567.

674 Behavior of Reinforced Concrete Beams and Slabs (3) Strength and behavior of statically indeterminate reinforced concrete beams and slabs; limit analysis; behavior, analysis, and design of reinforced concrete slabs; yield-line theory, finite element solutions, and ACI Code Method. Prereq: 574.

691 Special Topics in Civil Engineering (3) Selected advanced problems of current interest. Consent of instructor. May be repeated.

Environmental Engineering

GRADUATE COURSES

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

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

508 Seminar (1) Reports on current research in environmental engineering at UTK. Prereq: Graduate standing.

510 Environmental Protection (3) Managing of water resources, wastewaters, air quality, solid wastes, and hazardous materials; promotion of efficiency and comfort and to safeguard human beings and natural ecosystems. Prereq: Consent of instructor.

520 Open Channel Hydraulics (3) Open channel flow principles, properties, and classifications; uniform and gradually varied flow theory and applications; spillway design; steady/unsteady flow theory and analysis; dynamic routing; spatially varied flow; linear alignment; microcomputer applications, featuring HEC-2 model. Prereq: Civil Engineering 390.

522 Floodplain and Urban Flood Management (3) Review of national, regional, and local flood problems; state of the art flood damage reduction techniques; structural and non-structural institutional responses: policies, programs, regulations, issues, legal aspects; floodplain hydrology and hydrology, HEC-1, HEC-2: floodway encroachment, flood hazard zone and damage potential determinations; case studies. Prereq: Civil Engineering 390 or consent of instructor for non-majors.

524 Sediment Transport (3) Sediment properties and measurements; principles of dynamics of suspended and bed load sediment transport in rivers; water and sediment yield from disturbed land; methods and computer models for estimating sediment yield. Erosion and sediment control and management practices. Local and state regulations. Prereq: Civil Engineering 390. (Same as Agricultural Engineering 525.)


535 Ground Water Hydrology (3) Dynamics of flow and storage of groundwater; recharge, evaporation, recharge of river streams; methods for estimating yield of impounded reservoirs; analytical and numerical models of flow and transport. Prereq: Civil Engineering 395.

540 Remote Sensing for Transportation and Facilities Fabrication (3) Analysis of remote sensing; sources of data and data acquisition systems; photo interpretation; analog and digital techniques for analysis of aerial and terrestrial photos, radar and thermal imagery with applications to transportation facilities planning, construction, and operations. Prereq: Consent of instructor.

551 Remote Sensing Data Acquisition and Analysis (3) Active and passive sensors; automated analog and digital analysis and interpretation systems; image enhancement and classification techniques for color aerial photo and thermal imagery applications to environmental pollution and stress assessment. Prereq: Consent of instructor.

543 Instrumentation and Measurement (3) (Same as Agricultural Engineering 543.)

545 Monitoring Hydrologic Phenomena (3) (Same as Agricultural Engineering 545.)

551 Physicochemical Unit Processes (3) Theory and design application in water and wastewater treatment. Prereq: Civil Engineering 380, and Civil Engineering 390.

562 Biological Treatment Theory (3) Theory and design applications of biological processes to treatment of wastewater and solid wastes. Prereq: Civil Engineering 380. 2 hrs and 1 lab. (Same as Agricultural Engineering 552.)

553 Aquatic Chemistry (3) Theoretical, applied and analytical chemistry related to generation, measurement and treatment of environmental contaminants. Prereq: Chemistry 130, 2 hrs and 1 lab.

554 Environmental Engineering Chemistry (3) Application of chemical principles in analyzing physical, chemical, or biological interactions of chemical contaminants in various environmental compartments: atmosphere, hydrosphere, and biosphere. Prereq: One year chemistry and consent of instructor.

555 Solid Waste Management (3) Magnitude and characteristics of solid waste problems; collection systems; design of disposal systems: landfill, incineration, and composting, design of resource recovery systems: current and future regulations. Prereq: Consent of instructor.

556 Hazardous Waste Management (3) Analysis and design of operations and processes for hazardous waste disposal and processing; regulations, analysis, industrial applications. Prereq: Graduate standing or consent of instructor.

557 Hazardous Waste Site Remediation (3) Advanced study of processes for hazardous waste site remediation: soil vapor extraction, liquid waste washing, chemical destruction, thermal destruction, bioremediation. Prereq: 556 or consent of instructor.

570 Air Quality Management/Pollution Control (3) Introductory course on concepts of air pollution, analysis of relationships, sources, meteorology, effects; stack sampling; emission control systems. Prereq: Consent of instructor.

571 Design of Air Pollution Control Systems (3) Design and evaluation of systems used to control emission of gaseous and particulate air pollutants. Comprehensive design of specific devices and systems. Prereq: 570.

572 Air Quality Dispersion Modeling (3) Diffusion in atmosphere; application of atmospheric dispersion models and evaluation of meteorological and air quality data. Prereq: 570.

573 Sampling of Air Pollutants (3) Standard sampling methods for particulate and gaseous air pollutant emissions from industrial processes; ambient air monitoring instrumentation/techniques. Prereq: 570.

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

581 Industrial Pollution Prevention (3) (Same as Chemical Engineering 581 and Engineering Science and Agricultural Engineering 575.)

590 Special Problems in Environmental Engineering (1-6) Enrollment limited to environmental engineering students in nonthesis programs. May be repeated. Maximum 8 hrs. S/NC only.

595 Special Topics (1-4) Problems and topics related to current developments in field. May be repeated. Prereq: Consent of instructor.

596 Special Readings (1-4) Readings related to current developments in field. May be repeated.

600 Advanced Surface Water Hydraulics (3) Advanced topics in surface water hydraulic, solutions in St. Venant equations of unsteady flow for complex channel situations; dam breach modeling. Prereq: 520.

630 Advanced Stormwater Modeling (3) Advanced topics in stormwater modeling; stormwater quality modeling; advanced applications of available stormwater computer models. Prereq: 530.
Communications

(College of Communications)

MAJOR

DEGREES

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

The College of Communications offers the Master of Science and the Doctor of Philosophy degrees with a major in Communications. For application forms and other information about the M.S. and Ph.D. programs in Communications, write to: Associate Dean for Graduate Studies, College of Communications, 426 Communications Building, The University of Tennessee, Knoxville, TN 37996-0347.

ADMISSION REQUIREMENTS

Applicants must meet admission requirements of The Graduate School. In addition, they must complete the Graduate Record Examination, rating forms, and application forms as required by the College of Communications. Minimum requirements for admission to full potential candidate status normally include a 3.0 (4.0 system) grade-point average in undergraduate studies and scores at or above the fiftieth percentile in verbal and quantitative aptitude on the Graduate Record Examination. All application materials are screened by an admissions committee authorized by the faculty of the College of Communications.

New students normally are admitted to the programs only at the beginning of fall semester. However, under special circumstances, a student may be admitted at the beginning of spring semester in a temporary non-degree status. Applications for fall admission must be received by May 1. Applications for financial aid are due by March 1.

A baccalaureate degree in communications or a related field is recommended. Admission is possible with other baccalaureate degrees. However, all applicants without the appropriate background are required to take up to 18 semester hours of prerequisite and course work as determined by the department in which the student is enrolled. Students may take a proficiency test on any prerequisite course, subject to review by the master’s or doctoral committee of the College of Communications.

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

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of those states to enroll in certain programs at UT Knoxville at an in-state tuition basis. The M.S. program in Communications is available to residents of Arkansas, Kentucky, Louisiana (in-state course work), and Tennessee. The Ph.D. program is available to residents of the states of Alabama, Arkansas, Kentucky, Louisiana, Maryland, Virginia, or West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

ACADEMIC STANDARDS

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

THE MASTER’S PROGRAM

The Master of Science with a major in Communications is intended for students who desire a career in the mass media with an emphasis on communications management and a deeper understanding of the communication process and social role of the mass media. The program follows a broad-based multi-media approach while allowing the student to concentrate in one of the following areas: advertising, broadcasting, journalism or public relations. Both thesis and non-thesis options are available.

The prospective student who is interested in acquiring basic skills in one of the areas listed above is advised to enroll for a second baccalaureate rather than an advanced degree.

Degree Requirements

The M.S. program emphasizes communications management in the areas of advertising, broadcasting, journalism (publications), and public relations. For the thesis option, a minimum of 31 hours of approved graduate work is required. The non-thesis option requires 34 hours.

1. Ten hours of core courses—Communications 510, 512, 540, and 550 or 560, the first three of which must be taken during the first two semesters of the student’s program, except with written approval of the Associate Dean for Graduate Studies for the College.

2. Twelve hours within one department of the college, at least 6 hours at the 500 level or above. An internship, if needed, is included.

3. Three hours for the thesis option and 9 hours for the non-thesis option of electives from a list provided by the department in area of concentration.

4. Six hours of thesis work (Communications 590), including a thesis seminar, or a 3-hour project (Communications 590).

Additional hours may be required for those who do not have academic prerequisites, and an
internship may be required for those who do not have professional experience in the field they wish to study. A course in communications law is a prerequisite.

A student's internship experience requires approval by his/her advisor. Credit will be given through Advertising 598, Broadcasting 599, or Journalism 598. The student must pass an oral examination conducted by his/her graduate committee. The non-thesis option requires a written comprehensive examination and an oral defense of the project.

THE DOCTORAL PROGRAM

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

The program is interdisciplinary, consisting of a required core curriculum and recommended courses outside the College in the related social and behavioral sciences. The program is flexible and will accommodate a wide variety of career goals in communications. New students may be admitted to the program at any time; however, core courses begin only in the fall semester.

The master's degree is required for entry into the doctoral program. Students lacking academic or professional experience in communications will be required to take prerequisite courses. In general, however, the program may be completed within three academic years of full-time study beyond the master's degree.

The following are normally minimal requirements for admission to full potential candidate status:

1. a 3.0 (4.0 system) grade-point average in undergraduate studies, or 3.5 for graduate work in a master's degree
2. at or above the fiftieth percentile in verbal and quantitative aptitude on the Graduate Record Examination
3. endorsement by at least three former teachers or professional colleagues; and
4. a statement of the applicant's goals and reasons for pursuing the doctorate. Personal interviews with members of the Ph.D. Admissions Committee are recommended and may be required. Professional experience in some field of communications is a highly desirable criterion for admission.

A minimum of 88 hours of approved graduate work is required for the Ph.D.

1. Twenty-eight hours of core courses--Communications 610, 612, 620, 640, 641; 6 hours of statistics; and three of the following courses: Communications 622, 632, 642, and 652.
2. Fifteen hours in a primary concentration (advertising, broadcasting, information sciences, journalism, public relations, or speech communication) supplementing the core. Courses may be taken in one or more of the Departments of Advertising, Broadcasting, Speech Communication, and/or the Schools of Information Sciences and Journalism.

3. Twelve hours in a secondary concentration (outside the College of Communications).
5. Twenty-four hours of dissertation.

All courses require the approval of the student's advising committee.

Admission to candidacy must be attained at least two semesters prior to graduation and requires successful completion of a written comprehensive examination.

Each doctoral student's progress will be reviewed annually by the Doctoral Committee of the College of Communications. Results will be reported to the student by his/her program advisor, who will convey the committee's recommendation concerning the student's remaining in the program (non-binding) and suggestions for improvement in performance.

Candidates without prior teaching experience must register for Communications 521, Tutorial in Communications Teaching.

Planned course offerings in the College of Communications for a full calendar year are available the preceding November. This information is available from the Graduate Studies Office, 426 Communications Building, 974-6651. See also courses listed under Advertising, Broadcasting, Information Sciences, Journalism, and Speech Communication.

GRADUATE COURSES

400 Mass Communications Law and Ethics (3) Legal issues directly affecting the mass media: libel, privacy, free press-fair trial, judicial controls, governmental regulations. Ethical standards and practices of mass media in America. Prereq: Writing for Mass Communication or consent of instructor. E

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

502 Registration for Use of Facilities (3-15) Required before taking classes. Prereq: Consent of instructor.

510 Orientation to Master's Studies (1) Degree and program overview. Overview of research methods and information sources. Prereq: Consent of instructor or admission to program. S/N only. F

512 Fundamentals of Media Research (3) Applications of communications research techniques for management. Gathering and analysis of data for assessing media audiences and message impacts. Prereq: Consent of instructor or admission to program. S/N only. F

521 Tutorial in Communications Teaching (1) Experience as teacher under guidance of faculty member. Prereq: Consent of instructor. S/N only. E

540 Theory for Media Management (3) Selected research hypotheses and theories in literature of mass communications, managerial decision-making. Prereq: Consent of instructor or admission to program. F

550 Seminar in Media Economics and New Technology (3) Electronic and print media ownership, finance and corporate structure. Roles of new technologies and marketing techniques in changing media content and function in future. Prereq: Consent of instructor or admission to program. Sp

551 Seminar in Science, Society, and the Mass Media (3) Investigation of interplay between scientific community and mass media; how scientific information reaches public and impact of journalism on scientific practice. Prereq: Consent of instructor.

552 Seminar in Health Communications (3) Methods, problems, and issues of communication in health field. Media's reporting of health issues. Setting of media's "health agenda"; strategic uses of media in social marketing efforts; public communication of complex social/medical issues. Prereq: Consent of instructor.

553 Seminar in Risk Communications (3) Interaction of scientific, journalistic, and policy communities; technological, legal, and medical risks; analysis of methods for enhancing public understanding. Prereq: Consent of instructor.


590 Project (3) Capstone project under guidance of faculty. Application of principles from previous coursework. S/N only.

593 Seminar in Mass Communications Issues (3) Contemporary topics in communications. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

597 Independent Study (1-3) Reading, research or projects on special topics in communication. On individual basis, under faculty direction, with consent. May be repeated. Maximum 6 hrs. E

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

610 Orientation to Doctoral Research (1) Degree and dissertation requirements. Committee formation and program overview. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

612 Fundamentals of Communications Research (3) Universal research process from defining ideas and problems to reporting results. Causal inference and relative strengths of various research designs. Fundamentals and specific applications of most common data-gathering and measurement techniques in communications research: experimental, survey, content analysis, historical and qualitative. Prereq: Consent of instructor or admission to program. Sp

620 Seminar in Mass Communications Education (3) Role and scope of mass communications teaching unit, historical perspectives of curricular trends. Teaching methods and instructional objectives; classroom testing and measurement; design of professional curricula, research and extension; program evaluation; grants and contracts in research. Prereq: Consent of instructor or admission to program. Su

622 Quantitative Research (3) Techniques for evaluation of research design and measurement. Survey, content analysis, and experimental techniques. Assessment of reliability and validity. Data analysis, hypotheses testing, and inference strategies. Prereq: 612. F

632 Mass Communications History and Historiography (3) Origins and development of mass media in America, Philosophies of history. Historical sources and their verifications. Synthesis and interpretation of data. Prereq: 612 or consent of instructor.

640 Mass Communications Theory I (3) Selected research hypotheses, and theories in literature of mass communication theory. Prereq: Consent of instructor or admission to program. F

641 Mass Communications Theory II (3) Selected topics in theory. Critical evaluation of extant theory, derivation of new hypotheses and advanced theory construction. Prereq: 640. Sp

642 Qualitative Research (3) Theory and application of qualitative research methods to social science and communications research. Theoretical considerations underlying specific approaches; techniques translated into research strategies of participant observation, life history, interviewing, archival analysis, and case studies. Prereq: 612 or consent of instructor.

652 Mass Communications Law and Legal Research (3) Legal restrictions under which mass media operate. Finding, interpreting and analyzing sources of legal information. Prereq: 612 or consent of instructor. Sp

692 Advanced Topics in Communications Theory and Methodology (3) Advanced study of communication issues, theories and methods. May use qualitative, quantitative, historical or legal approaches. May be repeated. Prereq: 622, 632, 642 or 652 or consent of instructor.
Comparative and Experimental Medicine

(Major of the Vice Chancellor for Academic Affairs)

MAJOR

Comparative and Experimental Medicine .............. M.S., Ph.D.

L. N. D. Potgieter, Director

Joint Graduate Coordinating Committee:

Fuhr, J. E., Ph.D., Medical Biology
Lawler, J. E., Ph. D., Psychology
Lozzo, C., M.D., Medical Biology
Potgieter, L. N. D. (Liaison), B.V.Sc., Ph.D., Veterinary Teaching Hospital
Slauson, D. O., D.V.M., Ph.D., Veterinary Teaching Hospital

The Comparative and Experimental Medicine degree program (M.S. and Ph.D.) is a jointly-administered graduate program intended to prepare students for teaching and/or research careers in the health sciences. This program emphasizes the comparative approach to the study of experimental pathology, infectious diseases, immunopathology, hematology, aberrant metabolism, oncology, and genetic disorders. The Ph.D. program is open to approved graduate students seeking to train in this area and is especially useful for individuals with professional degrees. For the student with an undergraduate biological science background, the Comparative and Experimental Medicine program provides an unusual opportunity to study disease processes common in humans and animals from a multidisciplinary perspective. The scope of this intercollegiate program, which pools faculty resources from both veterinary and human medicine, is broadened by faculty members representing animal science and numerous areas of the life sciences. The interdisciplinary training environment includes such diverse support as facilities and personnel at the Veterinary Teaching Hospital, UT Medical Center at Knoxville, the Oak Ridge National Laboratory, Knoxville Zoological Park, Hemophilia Clinic, Developmental and Genetic Center, Hematology and Oncology services, and departments of life sciences.

For additional information, write to the Office of Research and Graduate Programs, P.O. Box 1071, Knoxville, TN 37901-1071.

ADMISSION REQUIREMENTS

Admission requirements of The Graduate School of UT Knoxville apply. In addition, all applicants must furnish three letters of recommendation from individuals who are familiar with their scholastic or professional records.

Master of Science Degree Program

Applicants must have a baccalaureate degree with coursework in chemistry through organic, mathematics through calculus, physics, and basic biology. More advanced study in biology such as biochemistry, mammalian anatomy, histology, cell biology, or other appropriate biomedical courses from an accredited university is recommended.

Applicants for admission to the Master of Science degree program whose background include no formal training in the biomedical field beyond the baccalaureate degree will be required to score at least 1,000 on the quantitative and verbal portions of the Graduate Record Examination.

Doctor of Philosophy Degree Program

Applicants generally will be expected to have a master's degree in one of the biological sciences and a Graduate Record Examination score of at least 1000 for the quantitative and verbal sections, or a professional degree in one of the medical sciences, (e.g., M.D., D.D.S., D.V.M.).

An individual having a baccalaureate degree with a strong background in the physical and biological sciences may be admitted upon presenting evidence of exemplary performance on the Graduate Record Examination.

Exceptional veterinary students at UT Knoxville may be admitted to the Comparative and Experimental Medicine graduate program but will be enrolled officially as veterinary students. During summers such students may take advantage of registering for graduate courses to be counted as elective courses in the veterinary program.

THE MASTER'S PROGRAM

All students must take at least 4 credit hours in 500- or 600-level courses in basic mechanisms of disease and at least 7 credit hours of 500-level biochemistry or cell biology. See listings under Biochemistry and Cellular and Molecular Biology program for information on these courses. In addition, students must complete a minimum of 8 hours of coursework in a specified discipline, 5 or more hours of electives, and 6 hours of Thesis 500.

The graduate committee (at least 3 members) is chosen after the first term and must include at least one member from the College of Veterinary Medicine and at least one member from the Graduate School of Medicine. If a minor is declared, one member must be from the minor discipline.

A final oral examination is given at the end of the program.

THE DOCTORAL PROGRAM

All students must take at least 4 credit hours in 500- or 600-level courses in basic mechanisms of disease and at least 7 credit hours of 500-level biochemistry or cell biology. See listings under Biochemistry and Cellular and Molecular Biology program for information on these courses. In addition, students must complete a minimum of 8 hours of coursework in a specified discipline. Areas of emphasis may include hematopathology, oncology, comparative pathology, comparative pharmacology, toxicology, immunology, genetics, infectious diseases, or biochemistry of disease. At least 24 hours of coursework, including a minimum of 6 hours at the 600 level, and 24 hours of Dissertation 600 are required for a total of 48 hours. For students with professional degrees, a minimum of 18 hours of coursework beyond the professional degree is required for a total of 42 hours.

The doctoral committee (at least 4 members) is chosen during the first year. Three of the four members, including the chair, must be approved by the Graduate Council to direct doctoral research. At least one member must be from the College of Veterinary Medicine and at least one member from the Graduate School of Medicine. A comprehensive examination is given at the completion of coursework. A seminar and final oral defense of the dissertation culminate the program.

Comparative and Experimental Medicine--Graduate School of Medicine

GRADUATE COURSES

Participating departments include: Anesthesiology, Medicine, Medical Biology, Obstetrics and Gynecology, Pathology, Pediatrics, Radiology, and Surgery.

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

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

508 Graduate Research Participation (3) Advanced research techniques while conducting individual biomedical research projects under supervision of faculty. Open to all graduate students. Prereq: Consent of instructor. May be repeated with consent of instructor. Maximum 9 hrs. S/NC only. E

521 Principles of Oncology (3) Lectures, classroom discussion, and case reports examining major topics of oncology. Prereq: Biology 220-30 or consent of instructor. E

541 Molecular Basis for Metabolic Disease (4) Disease at molecular level. Changes in molecular events in cells that lead to disease and occur as result of disease. Correlation with clinical and pathological states. Prereq: Biochemistry and Cellular and Molecular Biology 410-419 or equivalent. F,Sp

545 Clinical Genetics (3) Human genetic disorders: new developments in cytogenetics, molecular genetics, clinical diagnoses and prevention. Prereq: Biology and Genetics background or consent of instructor. F,Sp

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

610 Medical Biology Seminar (1) Invited speakers. Topics posted in advance. May be repeated. S/NC only. E

611 Advanced Topics in Medical Science (1-3) New developments in biological research applicable to clinical medicine. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. (Same as Biochemistry and Cellular and Molecular Biology 611.) F,Sp

652 Special Topics in Pathology (1-3) Pathologic anatomy, biochemical pathology, and related areas. Prereq: for doctoral candidates in Comparative and Experimental Medicine. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. F,Sp
Comparative and Experimental Medicine—Veterinary Medicine

GRADUATE COURSES

Participating departments include: Animal Science, Comparative Medicine, Microbiology, Pathology, Large Animal Clinical Sciences and Small Animal Clinical Sciences. Several faculty in the Department of Microbiology hold joint appointments in the College of Veterinary Medicine. See Microbiology under Fields of Instruction for additional courses.

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

501 Special Topics In Comparative and Experimental Medicine (1-4) Specialized experience in comparative and experimental medicine. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

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

503 Predictive Toxicology (3) Principles and techniques of predictive toxicology: structure-activity relationships, expert systems, neural nets and molecular similarity. Sp, A

505 Laboratory Animal Care and Use (2) Review of basic laboratory animal care and use as prerequisite to conducting research using animal subjects. Compliance issues and techniques. F

506 Experimental Animal Surgery (3) Competence in performing humane surgical modifications of experimental animals. Techniques of anesthesia, drug administration and postoperative care. Prereq: Embryology, parasitology, microbiology, and/or consent of instructor. 1 hr and 2 labs. F

521 Advanced Mammalian Physiology I (4) Mammalian physiology: structure and function of the body systems. Prereq: consent of instructor. 3 hrs and 2 labs. F

522 Advanced Mammalian Physiology II (4) Mammalian physiology: structure and function of the body systems. Prereq: consent of instructor. 3 hrs and 2 labs. Sp

530 Wildlife Diseases (2) (Same as Wildlife and Fisheries Science 530.)

536 Toxicology (2) (Same as Veterinary Medicine 536.)

537 Multispecies Medicine (4) (Same as Veterinary Medicine 537.)

538 Nutritional Aspects of Companion Animal Health (2) (Same as Animal Science 538.)

545 Principles of Medical Science (2) (Same as Veterinary Medicine 545.)

551 Mammalian Organology (3) (Same as Animal Science 551.)

552 Anatomy of Domestic Carnivores (4) (Same as Animal Science 552.)

554 Comparative Hematology (3) (Same as Animal Science 554.)

561 Pharmacology (4) Principles of pharmacokinetics and pharmacodynamics properties of drugs: mode of action, pharmacokinetic effects, chemical and physical properties, metabolism, toxicology, important idiosyncrasies, and clinical applications. Prereq: Consent of instructor. F

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

602 Surgical Pathology (1-2) Examination of biopsy specimens and interpretation of observations. Preparation of specimens for sectioning. Prereq: Consent of instructor. May be repeated. Maximum 3 hrs. E

603 Correlative Post-Mortem Pathology (1-3) Gross and microscopic post-mortem examination of animals. Correlative interpretation of clinical diseases and lesions. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

604 Veterinary Pathology Seminar (1) Microscopic slides and transparencies of lesions from cases examined by pathologists, residents, and graduate students. Interpretation of observations. Prereq: Consent of instructor. May be repeated. Maximum 4 hrs. E

605 Pathobiology Seminar (1) Subjects of current interest in biomedicine. Students present one seminar per term enrolled. Prereq: Consent of instructor. May be repeated. Maximum 4 hrs. Class meets once monthly.

606 Clinical Epidemiology (3) Theory and principles of design implementation and analysis of clinical research. Lab: analysis of biostatistical and design and design of proposal for clinical research project. Prereq: Consent of instructor. Sp

607 Diagnosis and Pathogenesis of Virus Diseases of Domestic Animals (3) Advanced study of virus diseases important to domestic animals: virus biology, pathogenesis, pathology, and diagnosis. Prereq: Cellular and Comparative Biochemistry, and Advanced Topics in Biochemistry. 2 hrs and 1 lab. Sp

608 Descriptive and Applied Epidemiology (2) Principles of epidemiology and historic and modern application to diseases of animals. Host-agent relationships, population dynamics, environmental factors, infection and disease monitoring and control, field investigations. Prereq: Consent of instructor. F

609 Mechanisms of Disease (4) Advanced topics in pathobiology and mechanisms of disease: pathophysiology, cellular degeneration, inflammation, immunopathology, necrosis. Principal biochemical and morphologic responses of cells, tissues, and organs to injury and other metabolic derangements. Selected contemporary topics from current literature and textbooks. Prereq: Consent of instructor. Sp

610 Advanced Topics in Comparative and Experimental Medicine (1-3) Specialized in-depth experience in selected topics. Prereq: consent of instructor. Maximum 6 hrs. E

615 Advanced Topics in Animal Anatomy (1-4) (Same as Animal Science 615.)

652 Disorders of the Endocrine System (2) (Same as Animal Science 652.)

Comparative Medicine

See College of Veterinary Medicine and Comparative and Experimental Medicine

Computer Science

See College of Arts and Sciences

MAJOR

DEGREES

Computer Science ........................................ M.S., Ph.D.

Robert C. Ward, Head

Professors:

Dongirra, Jack, Ph.D. ......................... New Mexico

Langston, Michael A., Ph.D. .............. Texas A&M

Poore, J. H., Ph.D. ......................... Georgia Tech

Sherman, Gordon R. (Emeritus), Ph.D. .. Purdue

Thomson, Michael G., Ph.D. ............. Duke

Ward, Robert C., Ph.D. ..................... Virginia

Associate Professor:

MacLennan, Bruce J., Ph.D. ............... Purdue

Vose, Michael D., Ph.D. ................. Texas

Assistant Professors:

Beck, Micael, Ph.D. ....................... Cornell

Barry, Michael W., Ph.D. ................. Illinois

Gregor, Jens, Ph.D. ....................... Aalborg (Denmark)

Jones, Mark T., Ph.D. ....................... Duke

Plank, James S., Ph.D. ..................... Princeton

Raghavan, Padma, Ph.D. ............... Penn State

Straight, David W., Ph.D. ................. Texas

Vander Zanden, Bradley, Ph.D. .......... Cornell

Instructor:

Mayo, J. Wallace (Liaison), M.S. ...... Tennessee

M.I.T.

THE MASTER'S PROGRAM

Two semesters of calculus plus two additional semesters of college mathematics (e.g., linear algebra, differential equations, probability) and a course in Discrete Structures and in Systems Programming are required for admission. For the master's degree, 30 semester hours of graduate credit are required, 24 of which must be 500 level or above. Computer Science 530, 550 and 580 are required for the degree. Graduate courses taken outside the department are sometimes allowed but must be approved by the Graduate Committee before enrollment.

Thesis Option

The student must reach agreement on a thesis topic with a faculty advisor and must take 6 hours of 500 Thesis. Six hours of 500 Thesis may count in the 24-hour requirement at the 500 level or above.

Non-Thesis Option

The student must take coursework in an area to prepare for the non-thesis master's examination. The student's advisor must verify that an acceptable set of courses has been taken before the student may schedule the examination. Information concerning the examination is available in the departmental office.

Master's Minor in Computer Science

The graduate minor consists of any two of the three core courses (530, 550, 580) plus an additional 3 hours of graded computer science graduate-level courses at or above the 400 level.

THE DOCTORAL PROGRAM

A student seeking admission to the Ph.D. program is expected to meet the following requirements:

1. The student should have three letters of recommendation sent directly to the department head from individuals capable of assessing the student's potential for advanced work in computer science (for example, college teachers or employers for whom the student has worked after earning a Bachelor's degree). The department reserves the right to contact these individuals or other knowledgeable people if additional information is deemed necessary or desirable.

2. The student is expected to have taken the GRE verbal and quantitative general test within the past three years and to have these scores sent to The Graduate School.
3. The student should satisfy the same background requirements as for the master's program. See the departmental brochure for details.

Original research reported in a dissertation of high quality is emphasized. The minimum hour requirements are 24 hours of course 600 Doctoral Research and Dissertation and 24 hours of graduate courses beyond the equivalent of a master's degree (i.e., beyond 30 graduate credit hours) graded A-F. Computer Science 530, 560 and 580 are required for the degree. At least six hours of 600-level graded courses must be taken in computer science at UTK. The student's advisor and committee will establish the specific course requirements. The comprehensive examination consists of a departmental written examination and a subsequent oral examination conducted by the student's committee.

GRADUATE COURSES

420 Advanced Topics in Machine Intelligence (3) Search, learning, expert systems, neural networks, pattern recognition and natural language processing. Faculty research. Prereq: Completion of core curriculum or consent of instructor. May be repeated. Maximum 9 hrs.

430 Advanced Topics in Hardware Systems (3) Architecture, parallel processors, microprogramming, networks and communications. Faculty research. Prereq: Completion of core curriculum or consent of instructor. May be repeated. Maximum 9 hrs.

480 Advanced Topics in Software Systems (3) Operating systems, compilers, parallel computation, software engineering, database systems and programming languages. Faculty research. Prereq: Completion of core curriculum or consent of instructor. May be repeated. Maximum 9 hrs.

470 Advanced Topics in Scientific Computation (3) Numerical methods, supercomputers and computer modeling and simulation of physical systems. Faculty research. Prereq: Completion of core curriculum or consent of instructor. May be repeated. Maximum 9 hrs.

471 Numerical Analysis (3) (Same as Mathematics 471.)

472 Numerical Algebra (3) (Same as Mathematics 472.)

480 Advanced Topics in Theoretical Computer Science (3) Theory of computation, complexity theory, formal languages and graph theory and its applications. Faculty research. Prereq: Completion of core curriculum or consent of instructor. May be repeated. Maximum 9 hrs.

484 Special Topics in Computer Science (1-3) May be repeated. Maximum 9 hrs.

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

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

521 Artificial Intelligence (3) Heuristic search, automatic theorem proving, symbolic methods, semantic information processing and representation theory. Prereq: Discrete Structures and Problem Solving.

522 Cybernetics (3) Various functions in living systems and their actual or potential realization in computers. Prereq: Discrete Structures.

523 Machine Learning (3) Algorithms whereby computers exhibit aspects of learning or inference about their environment. Supervised and unsupervised methods; data-driven pattern analysis; explicit and implicit structures. Prereq: 521.

525 Software Engineering (3) Survey of key ideas in software engineering; formal methods, tools, testing, reliability, structured design and development, metrics, management and history of the field.


532 Boolean Algebra, Logic Design and Microprocessors (3) Boolean algebra, combinational and sequential logic design, microprocessors, hardware lab. Prereq: One year of college mathematics beyond algebra and trigonometry.


538 Computer Networks (3) Design and operation of networks. Hardware and software systems; communications subsystems. Prereq: System Programming and 532.


551 Pattern Analysis (3) Decision-theoretic and structural pattern analysis. Deterministic and statistical decision rules, feature extraction and representation, syntactic and semantic methods, relational methods. Prereq: Digital design and probability or statistics.

552 Image Analysis (3) Techniques of computer image processing and understanding. Prereq: 551.

560 Language Design and Implementation (3) Compilers, lexical analysis, parsing, code generation and optimization, and run-time storage administration. Language design ideas; description, structure, and design philosophies of high-level languages. Prereq: System Programming.

563 Operating Systems (3) Operating system design, alternative strategies for memory allocation, device, and processor allocation and management. Protection, time sharing, real-time systems, memory management, interrupts, design project. Prereq: System Programming.

571-72 Numerical Mathematics (3) (Same as Mathematics 571-72.)

573 Finite Difference Methods for Partial Differential Equations (3) (Same as Mathematics 573.)

574 Finite Element Methods for Partial Differential Equations (3) (Same as Mathematics 574.)

575 Matrix Theory and Techniques in Numerical Analysis (3) (Same as Mathematics 575.)

576 Sparse Matrix Computations (3) Solution of large sparse linear systems, graph models, reordering techniques, symbolic factorization, data structures, numerical algorithms, complexity analysis, parallel algorithms. Prereq: Numerical linear algebra.

580 Foundations (3) Formal automata and regular sets, push-down automata and context-free languages, Turing Machines, recursively enumerable sets, undecidability, Cook's theorem and NP-completeness. Prereq: Discrete Structures.

581 Design and Analysis of Algorithms (3) Analysis of algorithms and relevance of analysis to design of efficient computer algorithms. Sorting, searching, graph algorithms, pattern matching, dynamic programming, efficient approximation algorithms.


593 Independent Study (1-15) May be repeated. Maximum 9 hrs.

594 Special Topics in Computer Science (1-3) May be repeated. Maximum 9 hrs.

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

620 Advanced Topics in Intelligent Systems (1-6) Prereq: Consent of instructor. May be repeated with consent of department.

630 Advanced Topics in Computer Systems (1-5) Prereq: Consent of instructor. May be repeated with consent of department.

640 Advanced Topics in Databases/Information Retrieval (1-6) Prereq: Consent of instructor. May be repeated with consent of department.

650 Advanced Topics in Pattern/Image Analysis (1-6) Prereq: Consent of instructor. May be repeated with consent of department.

660 Advanced Topics in Software Systems (1-6) Prereq: Consent of instructor. May be repeated with consent of department.

670 Advanced Topics in Numerical Mathematics (1-6) Prereq: Consent of instructor. May be repeated with consent of department.

680 Advanced Topics in Theory and Foundations (1-6) Prereq: Consent of instructor. May be repeated with consent of department.

690 Advanced Topics in Computer Science (1-6) Prereq: Consent of instructor. May be repeated with consent of department.

Counselor Education and Counseling Psychology (College of Education)

MAJORS

DEGREES

Education ................................. Ph.D. ................................. M.S., Ed.D.
Educational Psychology ................. M.S., Ed.D.
Educational Psychology and Guidance ................................. Ed.S.
Guidance ................................................. M.S.

M. A. Hector, Leader

Professors:

Davis, Kathleen L., Ed.D. ......................... Georgia
DeRidder, Lawerence M. (Emeritus), Ph.D. ................................................. Michigan
Dietz, Siegfried C. (Emeritus), Ed.D. ......................... Arizona State
Hector, M. A. (Liaison), Ph.D. .......... Michigan State
Huck, Schuyler W., Ph.D. ......................... Northwestern
McClain, Ed W. (Emeritus), Ph.D. .......... Texas
Peterson, M. P., Ph.D. ......................... Ohio State
Popen, William A., Ph.D. ......................... Ohio State
Thompson, C. L., Ph.D. ......................... Georgia

Associate Professor:

Hutchens, Teresa A., Ph.D. ......................... Georgia

The Counselor Education and Counseling Psychology unit offers graduate programs leading to the following: Master of Science with a major in Educational Psychology, concentration in community counseling; Master of Science with a major in Guidance, concentrations in elementary guidance, secondary guidance, and school counseling; Educational Specialist with a major in Educational Psychology and Guidance, concentration in school counseling; and Doctor of Education with a major in Educational Psychology, concentration in counselor education. The unit also participates in the college-wide Ph.D. program with a major in Education. The concentration area is theories and practices of educational and personal adjustment with specializations in counselor...
education, counseling psychology, and educational psychology. See Education under Fields of Instruction for full description of all degree requirements.

Several programs in the unit are accredited. The Ed.D. counselor education concentration and the Ph.D. specialization in counselor education are accredited by the Council for Accreditation of Counseling and Related Educational Programs; counseling psychology by the American Psychological Association. Also, the school counseling program has the approval of the National Council for Accreditation of Teacher Education. The community counseling and school counseling programs are accredited by the Council for Accreditation of Counseling and Related Educational Programs. The program in Educational Psychology has been recognized as a "Designated Program" by the American Association of State Psychology Boards and the Council for the National Register of Health Service Providers in Psychology.

For information about the various programs of study, write to the unit admissions secretary.

ADMISSION REQUIREMENTS

Admission requirements include up-to-date scores from the GRE, the unit admissions application form and letters of recommendation. For this doctoral program, a personal interview is also required. The application deadline for admission is February 1 for all programs. Some programs also review applications November 1.

GRADUATE COURSES

410 Sex Role Development: Implications for Education and Counseling (3) Theories and research concerning development of sex role and its relevance in educational and counseling settings. F,Su

431 Personality and Mental Health (3) Various perspectives of mental health with application to education and other social institutions. E

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

502 Registration for Use of Facilities (1-15) Required for the student not otherwise registered during any semester when student uses university facilities and for faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E


504 Special Topics (1-3) Instructor-initiated course offered at convenience of academic unit on topics of current interest. May be repeated. Maximum 16 hrs. S/NC or letter grade. E

510 Educational Specialist Research and Thesis (3) May be repeated. P/NP only. E

520 Statistics and Research Design: Conceptual (3) Consumption of treatment of statistics, research design, and quantitative basis of testing. E

521 Statistics and Research Design: Application (3) Data collection and analysis. Descriptive techniques, estimation, logic of hypothesis testing and selected parametric and nonparametric tests. F, Su

525 Formal Measurement in Education and Counseling (3) Principles of test construction and item analysis. Survey of standardized tests of intelligence, achievement, aptitude, vocational interest, attitudes and personality. Prereq: 520 or equivalent. F, Su

550 Introduction to Pupil Personnel Programs (3) History, philosophy, professional standards, counselor roles in relation to school staff and mental health professionals, and ethics of profession. F

551 Theory and Practice of Counseling (3) Philosophical bases of helping relationships; development of counselor and client self awareness; counseling theory/techniques. F, Su

552 Career Development: Vocational Theory, Research and Practice (3) Relationship of vocational theory, career development research and societal factors to life career roles. F, Su

553 Career and Educational Information Systems and Resources (3) Use of print and non-print materials: computer-based systems, for career and educational planning. Prereq: 552 or consent of instructor and Internet access account. F, Su

554 Group Dynamics and Methods (3) Theory and types of groups, descriptions of group practices, methods, dynamics, and facilitative skills, supervision of leadership skills. E

555 Practicum in Counseling (3) Practicum and application of counseling skills with individual clients. Prereq: Admission to program, 431, 525, 551 and consent of instructor. May be repeated. Maximum 9 hrs. S/NC only. E

556 Seminar in Community Agency Counseling (1) Orientation to professional organizations, code of ethics, certification requirements, and role identity of community agency counselors. May be repeated. Maximum 2 hrs. S/NC only. F, Sp

558 Internship in School Counseling (1-6) Supervised postpracticum employment at academic unit approved site. Prereq: 555 and consent of instructor. May be repeated. Maximum 12 hrs. S/NC only. E

559 Internship in Community Agency Counseling (1-6) Supervised postpracticum employment at academic unit approved site and supervised employment as community agency counselor. Prereq: Admission to community agency program, 555 and consent of instructor. May be repeated. Maximum 12 hrs. S/NC only. E

561 Development and Operation of School Counseling Programs (3) Management of comprehensive school counseling programs to include needs assessment, program goals, resource identification, evaluation, and use of computer-based management software. Prereq: 550. Sp, Su

566 Approaches to Family Intervention and Counseling (3) (Same as Child and Family Studies 566) Prereq: 550. Sp

570 Cross-Cultural Counseling: Theory and Research (3) Theory and research on issues and problems in counseling of clients from different cultural backgrounds in U.S. and abroad. Sp

585 Seminar in Gerontology (1) (Same as Human Development 585, Health 585, Psychology 585, Sociology 585.) Prereq: 550 or letter grade. E

593 Independent Study (1-3) May be repeated. S/NC or letter grade. E

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

602 Directed Research (1-3) Instructor-initiated research with master's level student in specific area of counseling psychology. Prereq: 431 or equivalent. F

604 Special Topics (1-3) Instructor-initiated course offered at convenience of academic unit on topics of current interest. May be repeated. Maximum 15 hrs. S/NC or letter grade. E

625 Advanced Study in Personality (3) Theory, research and conceptual analysis of research with application to education and counseling. May be repeated. Maximum 12 hrs. S/NC only. E

635 Ethical, Legal, and Professional Issues in Psychology (3) (Same as Psychology 635 and Psychoeducational Studies 635.) Prereq: 520 or equivalent. F

650 Seminar in Counselor Education (1) Professional issues related to role and function of counselor educator. Prereq: Admission to doctoral program in counselor education. May be repeated. Maximum 2 hrs. S/NC only. F

655 Practicum in Counselor Education (3) Supervised practice and application of counseling skills with clients. Prereq: Admission to counselor education program and consent of instructor. May be repeated. Maximum 6 hrs. Sp

Culture Studies in Education

(College of Education)

MAJOR

DEGREES

Curriculum and Instruction: M.S., Ed.D.
Education: Ph.D.
Human Performance and Sport Studies: M.S., Ed.D.

J. Paul, Leader

Professors:

Allison, C. B., Ph.D.......................................Oklahoma
Beitel, Patricia A., Ed.D.............................. North Carolina (Greensboro)
Howard, Robert (Emeritus), Ph.D..............Ohio State
Beitel, J., Ph.D.........................................North Carolina (Greensboro)
Malik, Anand, Ed.D.................................Columbia
Mead, B. J., Ph.D.................................Purdue
Morgan, W. J., Ph.D.................................Minnesota
Paul, Joan (Liaison), Ed.D.......................Alabama
Phillips, Magda (Emeritus), Ph.D..............Iowa State
Wisniewski, Richard, Ph.D........................Wayne State
Wiseberg, C. A., Ph.D...............................Michigan

659 Internship in Counselor Education (1-6) Supervised employment in academic unit approved internship sites in counselor education program. May be repeated. Maximum 12 hrs. S/NC only. E

661 Education Implications of Neuropsychology (3) Theory and assessment. Common syndromes and their behavioral and cognitive manifestations. Prereq: 516; and 541 or equivalent individual assessment course; consent of instructor. Sp


670 Foundations of Counseling Psychology (3) (History, theory, research and practice of counseling psychology. Prereq: Admission to counseling psychology doctoral program. May be repeated. Maximum 6 hrs. F, Sp

671 Personality and Vocational Assessment (3) Use and interpretation of personality and vocational measures in assessment of clients. Prereq: 525, 552 or consent of instructor. A

672 Psychological Dysfunction (3) Classification methods, dynamics and treatment of dysfunctional individuals in counseling. Prereq: 625 and course in abnormal psychology, or consent of instructor. A

673 Advanced Theory and Practice in Group Counseling (3) Theories and supervised practice. Prereq: 554, 555, and consent of instructor. F

674 Practicum in Counseling Psychology (3) Supervised practice of individual counseling. Minimum 1 5 clock hrs required each semester. Prereq: Admission to counseling psychology doctoral program, 555, and consent of instructor. May be repeated. Maximum 6 hrs. E

678 Theory and Practice of Counseling Supervision (3) Theory and practice of supervision in counseling. Prereq: 655, or 674, or consent of instructor, S/NC only. Sp

679 Internship in Counseling Psychology (1-6) Supervised employment in departmentally approved counseling psychology internship sites. Prereq: Admission to counseling psychology doctoral program and consent of instructor. May be repeated. Maximum 12 hrs. S/NC only. E

693 Independent Study (1-3) May be repeated. S/NC or letter grade. E
533 Psychology of Sport (3) Social psychological factors influencing human behavior in sport context; discussion of contemporary theory, research, and methodology. Prereq: General psychology course or consent of instructor.

534 Motor Behavior and Skill Acquisition (3) Topical explanation and application of principles of human movement behavior to acquisition and performance of skills; discussion of current research and methodology.

540 Foundations of Educational Policy (3) Relationship between theory, policy, and practice; educational policies that arise from philosophical and practical considerations relative to human nature, to educational purpose, to content of curriculum and to methods and techniques for conducting educational enterprise.

541 Special Topics (1-3) Advanced study in selected disciplinary or professional areas of physical education and/or sport. May be repeated.

542 Sociological Aspects of Sport (3) Social and cultural factors influencing sport and physical education. Pertinent issues and research applications. Prereq: Consent of instructor. (Same as Sociology 542.)

543 Human Motor Development (3) Changes in selected motor performance and related attributes areas during critical developmental periods within context of perceptual-motor development theories and explanations of factors influencing motor behavior.

545 Educational Sociology (3) Sociological analysis of American educational system. Controversial social issues that affect educational system and potential solutions offered by various programs. Open to juniors, seniors, and graduate students.

546 Topics in History of Education (3) May be repeated.

547 Topics in Philosophy of Education (3) May be repeated. F.Su

549 Topics in International Education (3) Historical, philosophical, and sociological foundations; selected nations and their cultures. May be repeated.

560 Introduction to Qualitative Research in Education (3) Fundamental of qualitative research methods and development of skills needed for qualitative research proposals. Overview of qualitative research methods: ethnography, case study, historiography, biography, oral and life history. Critical reading and evaluation of qualitative research studies.

593 Independent Study (1-3) May be repeated. S/NC or letter grade.

594 Supervised Reading (1-3) May be repeated. S/NC or letter grade.

595 Special Topics (1-3) Advanced study in selected aspects of cultural studies. May be repeated. Maximum 9 hrs. S/NC or letter grade.

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

604 Seminar in Curriculum and Instruction (1-3) Repeated. S/NC or letter grade.


514 Advanced Philosophy of Sport (3) Major philosophical theories of sport. Various conceptual, moral, aesthetic, and political issues. (Same as Sociology 594.)

526 Philosophy of Education (3) Truth, knowledge, and valuation in relation to work of schools.

539 Development of Education Thought (3) Historical and philosophical approach to lives and writings of influential educators: Plato, Quintilian, Comenius, Rousseau, Pestalozzi, Froebel, Dewey. Prereq: Graduate status and consent of instructor. Sp.
ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The Ph.D. program in Ecology is available to residents of the states of Alabama or Texas. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

NOTE: The departmental graduate program is currently undergoing revision. During this transition, questions regarding the program should be addressed to your advisor or the department head.

GRADUATE COURSES

411-412 Minicourse in Ecology and Evolutionary Biology (2) Selected advances topics in ecology, behavior, and evolutionary biology, concentrated in time and subject matter. Credit should be based on student work. Credit may be repeated. Maximum 4 hrs may apply toward departmental major.

431 Plant Ecology (3) Interactions between individuals, species, communities, and their environments. Circulation of energy and matter in ecosystems. Weekly field trips or laboratory periods, and at least two weekend field trips. Preq: Field Botany or equivalent. Su

450 Comparative Animal Behavior (3) Principles and methods of ethology, ecological, developmental, physiological and evolutionary aspects. (Same as Psychology 450.)

459 Comparative Animal Behavior Laboratory (3) Introduction to observational and experimental research in ethology. Coreq: 450. (Same as Psychology 459.)


470 Aquatic Ecology (3) Introduction to the physicochemical nature of inland waters with description of biotic communities and their interrelationships. Preq: General Chemistry and General Ecology, 2 hrs and 1 lab.

471 Field Limnology (3) Lab and field investigations of the physicochemical nature of inland waters, focusing on individual and interrelationships within biotic communities. Preq: One year of introductory chemistry, General Ecology of major orders of insects, with practical experience in identification of insects at family level. Preq. Consent of instructor. Lab, field, and independent project.

472 Arachnology (3) Biology of spiders, mites, scorpions and relatives. Preq: Comparative Invertebrate Biology or General Entomology, 2 hrs and 1 lab.


475 Ornithology (3) Behavior, ecology, populations, evolution and field identification of birds. Preq: General Ecology. 2 hrs and 1 lab.

476 Mammalogy (3) Evolution, classification, biogeography, ecology, behavior and functional anatomy of mammals. Preq: General Ecology or equivalent. 2 hrs and 1 lab.

484 Conservation Biology (3) Application of principles and techniques of ecological research to conservation of biodiversity at genetic, population, community, and ecosystem levels. Preq: General Genetics and General Ecology.

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

501 Graduate Research Participation (3) Advanced research techniques studied under supervision of staff research director. Open to all graduate students in good standing. Preq: Consent of department and research director. S/NC only.

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

503 Ecology and Evolutionary Biology Seminar (1) Advanced topics in ecology, behavior, and evolutionary biology. Senior departmental majors encouraged. Required of all first- and second-year graduate students. May be repeated. Maximum 4 hrs. S/NP only.

504 Special Topics (1-2) Selected directed readings or special course in topics of current interest. Consult departmental listing for offerings. May be repeated with consent of instructor. Maximum 9 hrs.

510 Special Problems in Ecology (1-3) Individual investigations in ecology. May be repeated with consent of instructor. Maximum 6 hrs.

516 Colloquium in Ethology (1) (Same as Psychology 516.)

520 Ecology for Planners and Engineers (3) Ecological considerations in design, construction and maintenance of buildings and other human structures. Preq: Consent of instructor. 3 hrs lecture, 1 hr discussion.

521 Environmental Planning (3) (Same as Planning 552.)

524 Physiological Ecology of Animals (3) Adaptive physiological response of animals to natural changes in their environment. Terrestrial and aquatic environments. Prereq: General Biology and General Physics. 4 hrs lecture, 2 hrs lab.

525 Advanced Animal Behavior (3) Second-level course in ethology, stressing evolution, genetics, physiology, ecology, and human behavior. Prereq: 450 or equivalent. (Same as Psychology 545.)

544 Fresh Water Invertebrate Zoology (3) Ecology and taxonomy of fresh water invertebrates exclusive of insects. Preq: Comparative Invertebrate Biology. 3 hrs lab and field study.

545 Advanced Animal Behavior (3) Second-level course in ethology, stressing evolution, genetics, physiology, ecology and human behavior. Prereq: 450 or equivalent. (Same as Psychology 545.)

547 Conceptual Foundations of Evolution and Behavior (3) (Same as Psychology 547.)

552 Development Planning in the Third World (3) (Same as Planning 552.)

555 Environmental Planning (3) (Same as Planning 555.)

560 Biometry (3) Statistical methods in analysis of quantitative biological data. Preq: Statistics course or consent of instructor.

561 Environmental Toxicology (3) (Same as Biochemistry and Cellular and Molecular Biology 561.)

573 Population Biology (3) Genetics and ecology of natural populations of plants and animals and aspects of behavior in determining population structure. Preq: Introductory courses in ecology and genetics. (Same as Botany 573.)

574 Communities and Ecosystems (3) Patterns underlying principles behind short and long term community and ecosystem organization, dynamics, energetics and nutrient cycling.

575 Ecological Genetics (3) Genetics of natural populations, using both single-locus and quantitative genetic approaches. Preq: 573 and statistics course.
Economics

(College of Business Administration)

MAJORS

Economics ......................................... M.A., Ph.D.
Business Administration .......................... MBA

William F. Fox, Head

Professors:
Bohm, Robert A. (Liaison), Ph.D. ............ Washington (St. Louis)
Bowley, Roger L. (Emeritus), Ph.D. .......... Texas
Carroll, Sidney L., Ph.D. ...................... Harvard
Chang, Hui S., Ph.D. ............................. Vanderbilt
Clark, Don P., Ph.D. .............................. Michigan State
Cole, William E. (Emeritus), Ph.D. ............ Texas
Davidson, Paul J. (Fred Holly Chair of Excellence), Ph.D. ........ Pennsylvania
Fox, William F., Ph.D. ........................... Ohio State
Garrison, Charles B., Ph.D. ................... Kentucky
Herzog, Henry W., Ph.D. ....................... Maryland
Jensen, Hans E. (Emeritus), Ph.D. ............ Texas
Lee, Fong-Yao, Ph.D. ............................. Michigan State
Mayhew, Anne P., Ph.D. ........................ Texas
Moore, John R. (Distinguished Prof.) (Emeritus), Ph.D. .......... Oklahoma

Schlottman, Alan M., Ph.D. ..................... Washington (St. Louis)
Spiva, George A. (Emeritus), Ph.D. ........... Texas

Associate Professors:
Gauger, Jean A., Ph.D. ........................... Iowa State
Glustoff, Errol, Ph.D. .............................. Stanford
Kahn, James R., Ph.D. ............................. Maryland
Mayo, John W., Ph.D. .............................. Washington (St. Louis)
Murray, M. N., Ph.D. .............................. Syracuse
Phillips, Keith E., Ph.D. .......................... Washington

Assistant Professors:
Brose, Peter M., Ph.D. ............................. Virginia
Farmer, Amy L., Ph.D. ............................. Duke
Rubin, Jonathan D., Ph.D. ........................ California (Davis)

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

ACADEMIC STANDARDS

A graduate student whose grade-point average falls below 3.0 will be placed on probation. A student on probation will be required to take a full load and must maintain a minimum grade-point average of 3.0. A student failing a qualifying examination will be dropped from the program unless his/her cumulative grade-point average is 3.0 or higher at the end of the probationary period. The probationary period is defined as the next semester's coursework established by the degree program for full-time students and the next two semesters' coursework established by the degree program for part-time students.

STUDENT'S RIGHT TO PETITION

Graduate students in good academic standing have the right to petition the department for modification of departmental degree requirements and redress of grievances. Petitions must be in writing and addressed to the Director of Graduate Studies.

THE MASTER'S PROGRAM

Admission to the M.A. program is based on undergraduate academic performance and on scores of the General Test of the GRE. The student may choose either the thesis or non-thesis option.

The non-thesis option requires 30 hours of coursework at the 400 level or above. Of these, at least 24 hours (at least 18 hours of which are in economics) must be at the 500 level or above. Of the minimum of 18 hours in economics at the 500 level or above, 12 hours must consist of 511, 512 and 513, 514, and the remaining 6 hours must be in one field of economics. Of the 30 hours, a maximum of 9 hours in courses approved by the department may be taken in fields other than economics. Students electing the non-thesis option are required to pass a final comprehensive examination.

The thesis option requires 30 hours of coursework at the 400 level or above, including at least 24 hours at the 500 level or above, 6 hours of which may be thesis hours. Of the remaining 18 hours at the 500 level or above, at least 15 hours must be in economics and must include 511, 512, 513, and 514. A maximum of 6 hours may be in an area other than economics.

THE DOCTORAL PROGRAM

Admission to the Ph.D. program is based on the recommendation of the Economics Department, the recommendation by the faculty of the Economics Department, and the recommendation by the department chair. Applicants should have a strong background in both natural and social sciences.

MINOR IN ENVIRONMENTAL POLICY

The program is designed to give master's degree students an opportunity to develop an interdisciplinary specialization in environmental policy. While administered under the Economics Department, the program is coordinated by representatives from the following participating departments: Agricultural Economics and Rural Sociology; Civil and Environmental Engineering; Ecology and Evolutionary Biology; Economics; Forest, Wildlife and Fisheries; Geography; Management; Political Science; and Sociology. Students may request admission to the minor following admission to the master's program in one of the participating departments. Students in good standing in one of these programs may apply for admission to the minor in environmental policy. The coordinating committee will consider the admission of interested students. Applicants should have a background in both natural and social sciences.
evidenced by prior coursework or experience. One course in environmental studies from the student’s major’s discipline and one course in quantitative methods are required. These requirements may be fulfilled before or after admission to the minor. All students admitted to the minor will be required to register for at least three hours of Economics 579, Environmental Policy Research Workshop, and to complete successfully the following:

1. Ecology and Evolutionary Biology 520 or Plant and Soil Sciences 414 or Geography 433 or an equivalent course approved by the coordinating committee.

2. Six hours of coursework outside the master’s discipline approved by the coordinating committee.

**BUSINESS ADMINISTRATION CONCENTRATION**

For complete listing of MBA program requirements, see Business Administration.

**MBA Concentration: Economics.**

Minimum course requirements are as approved by the area MBA faculty advisor.

**GRADUATE COURSES**

400 Special Topics (3) Topics vary. Prereq: Determined by department. May be repeated.

413 Macroeconomic Fluctuations (3) Analysis of historical data, methods of analyzing macro-economic fluctuations, theoretical explanations of cycles, and role of monetary and fiscal policies in aggregate economy. Major writing requirement. Prereq: Intermediate Macroeconomics or consent of instructor.

415 History of Economics (3) (Same as History 415.)

424 Political Economy of World Development (3) Topics vary: Latin America, Asia, Soviet Union and Eastern Europe. Analysis of major economic strategies, policies, and problems. Prereq: 201. This course includes a major writing requirement. May be repeated when topic varies. Maximum 9 hrs.


452 Economics of Resources and Environmental Policy (3) Economic analysis of environmental policy and allocation of resources. Benefits and costs of development of natural resources and impact on the environment. Major writing requirement. Prereq: 201.

471 Public Finance: Optimal Government Functions and Expenditure Analysis (3) Problems of collective consumption, external effects, public investment, social decision making. Major writing requirement. Prereq: 201.

472 Public Finance: Taxation and Intergovernmental Relations (3) Analysis of individual taxes and of tax systems, non-tax sources of revenue, fiscal federalism. Major writing requirement. Prereq: 201.

482 Introduction to Mathematical Economics (3) Application of basic mathematical tools: calculus, matrix algebra, etc. to major topics of economic theory. Prereq: Intermediate Microeconomics with B or better and Calculus.

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

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

511-12 Microeconomic Theory (3, 3) Theory of consumer behavior, theory of supply and demand, theory of revealed preference, attributes of goods and implicit prices, market demand, labor supply, individual behavior under uncertainty, theory of firm, theory of production and cost, market structures, derived demand and factor pricing, introduction to welfare economics, market failure and theory of second best, pure exchange.

513-14 Macroeconomic Theory (3, 3) Determination of national income, prices, and employment. Results using Keynesian, monetarist, and rational expectations paradigm.

515 History of Economics (3) Purpose and methods of history of economics. Background for and origins, concerns, methods, development, and conclusions of classical political economy from Adam Smith through J.S. Mill and K. Marx. Prereqs: 201 and H.H. Gossen.

525 Economic History of Europe (3) Nature and functioning of economic systems and policies in history of Western civilization. Major issues of methods and interpretation. Prereqs: Graduate standing in economics or consent of instructor.

526 Economic History of the U.S. (3) Interpretation of American economic structure and policies from colonial times. Prereqs: Graduate standing in economics or consent of instructor.

537 Managing in a Regulated Economy (3) Economic effects of antitrust and public utility, international and environmental regulation on business. Development of decision-making skills in area of governmental-business relations.

552 Labor Relations and Collective Bargaining (3) (Same as Management 552.)

577 Environmental Economics and Policy Management (3) Interdisciplinary perspective on goals of sustainable economic development and environmental quality. Development of decision-making tools and conflict resolution.


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

613 Advanced Macroeconomic Theory (3) Prereq: 514 or equivalent.


623 Economic Development: Theories and Policies (3) Principal theories explaining economic behavior in developing countries and policies and strategies used to promote development. Prereq: Undergraduate degree in economics or consent of instructor.

624 Economic Development: Western Impact on Asia and Africa (3) Studies of consequences of contact between developed world and developing countries of Asia and Africa. Prereq: 21 hrs of upper division undergraduate social science or consent of instructor.


642 Labor History and Legislation (3) Development of organized labor as important economic and political force in U.S. over past 100 years. History of labor legislation. Evolution of legal status of labor unions and of individual workers within their employers.

651 Monetary Theory (3) Study of money, credit, and liquidity as related to real output determination, interest rates, employment, and prices. Prereq: 513.


661 Regional and Urban Location and Development Theory (3) Theory of industrial and agricultural location and human migration. Economic basis for land use patterns, central places, and urban form. Spatial inequalities and urban problems. National policies for regional and urban assistance.

662 Methods of Regional and Urban Analysis (3) Theory of regional/urban economic structure and growth. Regional income and product accounts, shift and share analysis, economic base studies, and regional input-output models. Theory and problem solution.


672 Public Finance: Taxation and Intergovernmental Relations (3) Theory of taxation; tax incidence and tax efficiency, policy analysis of U.S. tax structure at federal, state, and local levels. Theory of fiscal federalism and intergovernmental relations.

677 Environmental and Natural Resource Economics (3) Alternative paradigms for allocating and valuing environmental resources. Exploration of issues related to market failure and differences between renewable and nonrenewable resources.

678 Economics of Environmental Policy (3) Topics in environmental policy analysis. Consideration of alternative policy instruments, defining policy objectives and role of risk in decision-making process.

681-82 Econometric Methods (3, 3) Theory and techniques of statistical testing of economic hypotheses and construction and estimation of econometric models. Review of classical least squares regression model, and approaches to simultaneous equation models with applications to current econometric research. Prereq: 582 or equivalent.

690 Workshop (3) Advanced topics in economics. Student participation. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

**Education**

(College of Education)

**MAJORS**

| DEGREES |
|-----------------|---|
| College Student Personnel .................................. M.S. |
| Curriculum and Instruction .................................. M.S., Ed.D. |
| Education Administration ...................................... M.S., Ph.D. |
| Educational Psychology ....................................... M.S., Ed.D. |
| Educational Psychology and Guidance ...................... Ed.S., Guidance ................................ M.S. |

**DEGREES**

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<td>Leadership Studies in ....... M.S., Ed.D.</td>
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<td>Education ...................... M.S., Ed.D., Ed.S.</td>
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<td>Rehabilitation Counseling .... M.S.</td>
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The College of Education offers the Master of Science, Educational Specialist, Doctor of Education, and Doctor of Philosophy degrees in cooperation with eleven individual units.
and non-thesis options are available for both disciplinary areas or those who are seeking a master's degree in Curriculum and Instruction. The program features a professional year internship with accompanying coursework.

**TEACHER LICENSURE**

For teacher licensure, a student must complete the 24 hours associated with the professional year as follows:

**Fall Semester**
- 575 Internship 4 hrs
- 574 Analysis of Teaching for Professional Development 2 hrs

**Spring Semester**
- 575 Internship 8 hrs
- 591 Clinical Studies 4 hrs

**TOTAL** 24 hrs

To receive graduate credit, a student must be admitted to The Graduate School prior to the first semester of internship and register as a graduate student. A major in either Curriculum and Instruction or Special Education is required, and a student must be admitted to the program prior to completion of the first semester of internship. See the individual Track 2 program descriptions below for complete details.

**THE MASTER’S PROGRAMS**

**College Student Personnel**

This program under the unit of Leadership Studies is designed for individuals interested in entering the field of student personnel administration in colleges and universities and in community or junior colleges. The program has both a thesis and non-thesis option. A minimum of 36 hours, which includes 6 hours of practicum experience, is required in either option, with a minimum of 12 hours in Higher Education courses.

**Curriculum and Instruction**

Two tracks for the master's degree with a major in Curriculum and Instruction are offered. Track 1 is for students who are already certified to teach in a curriculum and instruction disciplinary area or those students who are seeking a master's degree without certification. Track 2 is for students seeking initial licensure. Thesis and non-thesis options are available for both tracks.

**Track 1** - Concentrations are available in social foundations and cultural studies in education under Cultural Studies in Education; curriculum, elementary education, instructional media and technology, mathematics education, and science education under Education in the Sciences, Mathematics, Research, and Technology; leadership education, reading education, and social science education under Holistic Teaching/Learning; elementary education under Inclusive Early Childhood Education; and art education, English education, foreign language education, and reading education under Language, Communication, and Humanities Education.

For both tracks, a comprehensive written examination is required. An oral exam is given over the thesis.

**Educational Psychology**

Admission requirements include up-to-date scores from the GRE, one admission application form and letters of recommendation. All programs include thesis and non-thesis options. Under Counselor Education and Counseling Psychology, a major in Educational Psychology, concentration in community counseling, requires 60 hours plus supervised practicum and internship experiences working with clients. Under Psychoeducational Studies, the major in Educational Psychology, concentration in adult education, educational psychology, and individual and collaborative learning, requires 36 hours. The concentration in adult education requires a minimum of 12 hours in Adult Education courses.

A final examination is required of all master's degree students.

**Guidance**

Admission requirements include up-to-date scores from the GRE, the unit admissions application form and letters of recommendation. The program includes thesis and non-thesis options. Under Counselor Education and Counseling Psychology, a major in Guidance, concentrations in elementary guidance, school counseling, and secondary guidance, requires 18 hours and supervised practicum and internship experiences working with clients. A final examination is required.

**Human Performance and Sport Studies**

Concentrations are available in motor behavior and sociocultural foundations under Cultural Studies in Education; exercise science under Exercise Science; and sport administration under Sport and Physical Activity. Both thesis and non-thesis options are available. The non-thesis option requires 30 hours, including a project, a course in research design, and research methods. The thesis option requires the completion of 36 hours, including 6 hours of Thesis 500. Both options require a minimum of 12 hours of Sport Studies, Exercise Science, or Sport Management courses.

**Leadership Studies in Education**

The master’s degree program under Leadership Studies in Education offers a concentration in educational administration and supervision, requiring a minimum of 33 credit hours including 8 hours of Thesis 500 for the thesis option and 36 hours for the non-thesis option.

**Rehabilitation Counseling**

The program under Rehabilitation and Deafness prepares professional counselors for successful practice in public and private rehabilitation programs. Rehabilitation counselors assist individuals with disabilities to achieve their optimal level of functioning in living, learning, and working environments. Rehabilitation counselors work primarily with adult and elderly clients who have congenital or acquired physical, intellectual, or emotional disabilities. Clinical practice offers students an opportunity to emphasize skill development for specific or general disability caseloads. The program is fully accredited through the Council on Rehabilitation Education, Inc. and requires 54 semester hours, including internship. A minimum of 12 hours of Rehabilitation and Deafness courses is required. Thesis and non-thesis options are available. Graduates are employed by federal and state governments, hospitals, private industry, and a variety of community agencies.

**Special Education**

Two tracks are offered for the master’s degree in Special Education. Track 1 is for students who are already licensed to teach in special education or a related field. Track 2 is for students seeking initial licensure. Thesis and non-thesis options are available for both tracks.
Concentrations for both tracks are offered in general special education under Holistic Teaching/Learning, early childhood special education under Inclusive Early Childhood Education; and hearing impaired under Rehabilitation and Deafness Education.

**Track 1 - Coursework** may apply toward State of Tennessee endorsements (add-on certification in specific licensure areas). The non-thesis option requires 36 hours, including a minimum of 18 in the specific discipline, and a final written and oral comprehensive examination. The thesis option requires 39 hours, including 6 hours of Thesis 500, and a minimum of 12 hours in the discipline.

**Track 2 - The requirements are the same as those for Teacher Licensure plus 12 hours in the academic discipline as approved by the student’s committee, for a total of 36 hours. The thesis option requires 6 additional hours of Thesis 500 for a total of 42 hours.**

Students completing a program of study in the general special education concentration area are qualified and/or consultants in a variety of special education programs providing services to people certified as mentally retarded, learning disabled, emotionally disturbed, gifted, physical-health disabled, multiply disabled, and socially or emotionally disturbed.

**General Special Education Majors,** in conjunction with their committees, select one or more specializations for their program of study. Six to nine hours of coursework in the designated area should be taken. Approved specializations include affective/motivational approaches, assessment/diagnosis, cognitive education, early childhood, gifted education, rehabilitation, and technology. Students also may select a cognate of three to six hours of coursework taken outside the unit.

Students completing a program of study in the education of the hearing impaired concentration area are qualified to teach in public or residential schools for the hearing impaired. Graduates are eligible for both Council on Education of the Deaf (CED) certification and Tennessee state certification. Internships (student teaching) may be completed at the Tennessee State, or in mainstream programs in the state or in programs for the hearing impaired in North Carolina, Kentucky, Georgia, Virginia and the District of Columbia.

**THE SPECIALIST IN EDUCATION PROGRAMS**

**Curriculum and instruction**

The Educational Specialist degree program with a major in Curriculum and Instruction encompasses concentrations in curriculum, elementary education, instructional media and technology, mathematics education, and science education under Education in the Sciences, Mathematics, Research, and Technology; in elementary education, reading education, second language education, and teaching and learning under Holistic Teaching/Learning; in elementary education under Inclusive Early Childhood Education; and in English education, foreign language education, and reading education under Language, Communication, and Humanities Education. Refer to Degree Requirements under The Graduate School for complete program requirements.

**Educational Psychology and Guidance**

Under Counselor Education and Counseling Psychology, the minimum number of hours required for the concentration in counselor education is 79. Under Psychoeducational Studies, the minimum number of hours required is 89. Students may take two consecutive semesters. A concentration in adult education and in collaborative learning is also available with a major in Educational Psychology under the Psychoeducational Studies unit.

The concentration in counselor education requires a year-long practicum sequence and the equivalent of a year’s full-time work as an intern in an appropriate counseling setting. It also requires supervised practicum experience in classroom teaching. Coursework in statistics and research design is a requirement for all concentrations/programs. All doctoral students take written comprehensive examinations in the program concentration, supporting specialization and cognate areas. The guidelines for each program concentration may be consulted for further requirements.

**Leadership Studies in Education**

For the Ed.D. program under Leadership Studies, with concentrations in educational administration and supervision and in higher education, the minimum hours are determined by the student’s doctoral committee. Six to 9 hours must be in a cognate area within the college and 6-9 hours outside the college unless the student has a master’s degree in a field outside the College of Education. Two consecutive semesters of 604 must be taken during residence. An internship is highly recommended but not required. A foreign language requirement is at the discretion of the committee. A written comprehensive examination is given as well as an oral exam over the dissertation.

The Leadership Studies unit offers an alternative approach to residence for the Doctor of Education degree. This alternative residence involves, among other requirements, a two-year, on-campus, continuous enrollment in Leadership Studies 606, Leadership Forum. Interested students should contact the unit for further information.

The Leadership Studies unit also offers an Ed.D. concentration for practicing school administrators. Please contact the unit for further information.

**Human Performance and Sport Studies**

The Doctor of Education with a major in Human Performance and Sport Studies is available under Cultural Studies in Education with concentrations in motor behavior and sociocultural foundations (history, philosophy, sociology); under Exercise Science with a concentration in exercise science (exercise physiology/fitness, kinesiology/sports medicine). Please contact the appropriate unit for further information.

**THE DOCTOR OF PHILOSOPHY PROGRAM**

The intercollegiate Ph.D. program with a major in Education provides seventeen concentrations. The units participating in the Ph.D. program are Counselor Education and Counseling Psychology; Cultural Studies in Education; Education in the Sciences, Mathematics, Research, and Technology; Exercise Science; Holistic Teaching/Learning; Inclusive Early Childhood Education; Language, Communication, and Humanities Education; Leadership Studies in Education; Psychoeducational Studies; and Rehabilitation, Deafness, and Human Services.

The program requirements are:

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<tr>
<th>Requirements</th>
<th>Minimum Hours</th>
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<tbody>
<tr>
<td>Research Area</td>
<td>15</td>
</tr>
<tr>
<td>Foreign or Computer Language (demonstrate proficiency)</td>
<td>6</td>
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<tr>
<td>General Core Requirements</td>
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<tr>
<td>Option A</td>
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<tr>
<td>—History and philosophy of education, (both areas must be represented)</td>
<td>4</td>
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<tr>
<td>—Learning theory and curriculum (both areas must be represented)</td>
<td>4</td>
</tr>
<tr>
<td>—Administrative/Leadership theory</td>
<td>2</td>
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</table>
The unit that specifies which specialization is for the Ph.D. in Education program and one for Dissertation Concentrations.

Proficiency. Coursework in statistics and well as either foreign language or computer Psychology, the following minimum number of hours is required in each program: educational psychology, 92; school psychology, 97. The guidelines for each program may be consulted for further requirements.

MINOR IN GERONTOLOGY

Graduate students in the units of Counselor Education and Counseling Psychology, Exercise Science, or Psychoeducational Studies, may pursue a specialized minor in gerontology. This interunit/interdisciplinary minor gives the student an opportunity for combining the knowledge about aging in American society with his/her major concentration. Please refer to Human Ecology for specific requirements.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The M.S. program in Curriculum and Instruction (concentration in foreign language education-Track 1 only) is available to residents of the state of Louisiana. The Ph.D. program in Education is available to residents of the state of Arkansas (concentration in administrative theory and practice or in theories and practice of educational and personal adjustment only). The M.S. program in Human Performance and Sport Studies is available to residents of Arkansas, Georgia (concentration in motor behavior only). The M.S. in Rehabilitation Counseling is available to residents of Alabama. The M.S. program in Special Education is available to residents of the state of Kentucky (concentration in learning impaired or early childhood special education), South Carolina or Virginia (concentration in hearing impaired only), or West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

510 Advanced Educational and Clinical Procedures (3-4) Integration of advanced educational and clinical procedures; skills and knowledge for implementing instruction and for consulting with other persons in treatment of exceptional individuals. May be repeated. Maximum 6 hrs.

517 Seminar (1-3) Curriculum, instructional technology, elementary education, secondary education, or social foundations as related to goals of students' programs. May be repeated. Maximum 6 hrs. S/N only.

532 Instructional Research: Analysis and Application (3) Analysis of research on instruction. Translation and application of research findings into instructional performance. Prereq: Consent of Instructor.

540 Topics in Improvement of Instruction (1-3) Special conferences, workshops, and in-service programs. May be repeated. Maximum 6 hrs. S/N only.

562 Direction and Supervision of Student Teaching (3) Roles and responsibilities of cooperating teachers and student teaching; elements of effective teaching program; elements of clinical supervision; overview of research. F, Su

568 Teacher-Parent-Community Relations (3) Techniques for effective relations between parents and teachers; examination of roles and expectations; parental involvement; volunteer programs; influence of community on educational process. Prereq: Consent of Instructor. Ed.D.

574 Analysis of Teaching for Professional Development (2) Strategies to document and analyze effective teaching based on research and professional development. Study and application of various approaches. Coreq: 575.

575 Professional Internship in Teaching (1-8) Intensive teaching and teaching-related experiences in professional settings in public schools. Enrollment limited to post-baccalaureate students in professional year program. Prereq: Admission to Teacher Education program. May be repeated. Maximum 12 hrs. S/N only.

576 Practicum in Classroom Teaching (1-8) Teaching and teaching-related experiences in elementary and secondary school settings. Specific hours and school level assignment determined by licensure or certification requirements. May not be used for probationary licensure year. May not be used toward degree requirements. May be repeated. Maximum 12 hrs. S/N only.

589 Field Experience (1-3) Application of curricular and instructional principles, methods, and materials in schools. Prereq: Program prerequisites and consent of instructor. May be repeated. Maximum 9 hrs. S/N only.

591 Clinical Studies (4) Group and individual seminar activities during full-time internship. Application and evaluation of professional core competencies. Completion and presentation of portfolio and analysis of teaching project. Coreq: 575.

601 Trans-College Seminar (1) Introduction to Ph.D. program in Education: research requirements, meaning of scholarship in academic and issues/problems in education. Minimum of two consecutive semesters preceded or followed by summer term required of all Ph.D. students. Prereq: Admission to Ph.D. program or consent of Ph.D. program coordinator. May be repeated. Maximum 3 hrs. May not be used to meet 600 requirement. S/N only.

618 Interpretation and Application Curriculum and Instruction Research (3) Analysis of research in curriculum and instruction, newer methodologies and strategies. Utilization of research to improve curriculum and instruction practice, research of application of research principles in context of specific professional assignments. Prereq: Consent of instructor.

635 Teacher Education in America (3) For students preparing to enter teacher education. Brief historical development, program analysis and evaluation, current issues, and future directions.

Education in the Sciences, Mathematics, Research, and Technology

(1) College of Education)

MAJOR

DEGREES

Curriculum and Instruction M.S., Ed.S., Ed.D. Education

M. Everett Myer, Leader

Professors:

Butefish, William L. (Emeritus), Ed.D. Texas Tech

Dessart, Donald J., Ph.D. Maryland

Doak, E. Dale, Ed.D. Colorado

McIntyre, Lonnie D., Ed.D. Indiana

Myer, M. E., Ph.D. Florida
GRADUATE COURSES

475 Utilization of Instructional Media (3) Basic concepts of communication and instructional development for improving instruction through use of media. (Same as Information Sciences 475.) E

485 Teaching Mathematics, Grades 7-12 (3) Preparation of teaching plans, evaluation, materials for teaching mathematics; teaching simulation and directed observation in schools. Prereq: Admission to Teacher Education Program.

486 Introduction to Computational (3) Classroom use of computers, applications for teachers, overview of computer operation and software for teachers of all grades. F, Sp.


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

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student is enrolled in classroom courses. May not be used toward degree requirements. May be repeated. S/NC only. E


518 Educational Specialist Research and Thesis (3) May be repeated. P/NP only. E

520 Techniques of Research in Education (3) Study and applications.

522 Programs and Materials in Elementary School Mathematics (3) Examination, development and use of materials for creating an active learning environment for teaching mathematics in elementary and middle schools. Prereq: 530, 643, or equivalent.

530 Teaching Mathematics to Young Children: K-4 (3) Unit planning, daily planning, grouping and other strategies of teaching mathematics. For those with little or no preparation in teaching elementary school mathematics.

531 Teaching Science in Elementary and Middle Schools (3) Recent trends in methods, materials and content in teaching elementary school science. Prereq:

Course in teaching elementary school science or consent of instructor. F

535 Curriculum Evaluation and Program Improvement (3) Historical background and importance of educational evaluation in relation to curriculum development. Understanding systematic curriculum evaluation approach and applying it to improve program development and implementation. Prereq: Consent of instructor. E

541 The High School Curriculum (3) Identification of problems associated with curriculum study, Tennessee curriculum framework, assessment of trends in programs of local, regional and national significance. E

543 Teaching Mathematics in Middle Schools: K-6 (3) Unit planning, daily planning, grouping and other strategies of teaching mathematics. For those with little preparation in teaching middle school mathematics.

557 The Junior High and Middle School Curriculum (3) Curriculum and instructional design for junior high and middle school. Characteristics of students, curriculum designs, instructional patterns, and organization and structure of junior high and middle school. Sp, Su.

558 Curriculum Planning and Development (3) Fundamentals and principles of curriculum planning and development. Historical analysis of curriculum theory, principles of planning and development, and classroom applications for improved learning. E


561 Educational Statistics (3) Applications of descriptive and inferential statistics to educational and instructional problems. Use of computer calculators in educational research. Prereq: One year of college mathematics, an elementary course in statistics, or consent of instructor. F, Su.

566 Administrative Instructional Media Programs (3) Leadership roles and responsibilities of professional media administrator in variety of organizational settings.

569 Advanced Production of Audiovisual Software (3) Hand and mechanical lettering, flat picture mounting, laminating, filmstrips, audiovisual, audio production, TV studio orientation, sync-taping, multi-screen presentations, and printing techniques. (Same as Information Science 569.) Sp, Su.

577 Introduction To Data Processing in Curriculum and Instruction (3) Analysis of current trends and issues in the field of data processing in curriculum and instruction. Instructional, instructional, and classroom management applications from microcomputers to super computers. Prereq: Consent of instructor. F, Su.


582 Teaching Enrichment Mathematics in Middle and Junior High Schools (3) Topics to enrich middle school and/or junior high mathematics. Geometric, laboratory, and problem solving activities. Special attention to metric system. Opportunities for individual projects. Prereq: 561. Su.


586 Teaching Probability & Statistics (3) Teaching of probability and statistics in schools, elementary through college. Prerequisites and statistical experiments, demonstrations, and applications. Prereq: 581. F.

596 Instructional Theory and Design (3) Relationship of curriculum to instruction; examination of instructional and related learning theories; instructional models and teaching styles. E

593 Independent Study (1-3) May be repeated. S/NC or letter grade. E

594 Supervised Readings (1-3) May be repeated. S/NC or letter grade. E

595 Special Topics (1-3) May be repeated. S/NC or letter grade. E

596 Curricular Trends and Issues in Science Education (3) Analysis of elementary and secondary curricular frameworks, instructional, physical, and environmental sciences. Impact of current learning theories on future curriculum development projects. Prereq: 496, 422, or equivalent. Prereq or coreq: 555 or consent of instructor.

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


669 Instructional Media Research (3) Identification, location, and analysis of development and experimental research on instructional media. Application of research. F, Sp.

671 Advanced Educational Statistics (3) Applications of parametric and non-parametric statistical inference to educational and instructional problems. Use of microcomputers in educational research. Prereq: 561, Sp, Su.

672 Interpretation and Application of Curriculum and Instruction Research (3) Analysis of research in curriculum and instruction, newer methodologies and strategies. Utilization of research to improve curriculum and instruction practice, application of research principles in context of specific professional assignments. Prereq: Consent of instructor. Sp.


676 Curriculum Theory (3) Influential curriculum theories and approaches, implications for structure and design of educational programs. Nature and function of theory, theory building activities. Prereq: Consent of instructor. E

683 Advanced Studies in Elementary School Mathematics (2) Research in elementary school mathematics. Prereq: Graduate course in mathematics education or consent of instructor. Sp.

689 Internship (1-3) Experiences in application of principles and practices of curriculum development and instructional improvement. Prerequisites and applications. Program prerequisites and consent of instructor. May be repeated. Maximum 9 hrs. S/NC only. E

693 Independent Study (1-3) May be repeated. S/NC or letter grade. E

694 Supervised Reading (1-3) May be repeated. S/NC or letter grade. E

695 Special Topics (1-3) May be repeated. S/NC or letter grade. E

Research Assistantships are available at each location. Further information about this program is available from the department.

**THE MASTER'S PROGRAM**

Graduate work leading to the Master of Science with a major in Electrical Engineering may be completed during one academic year of full-time study, or the degree may be obtained in two or three years of study in the evening.

**Admission Requirements**

Students applying for admission to the Master of Science program and who hold a B.S. in Electrical Engineering are considered for admission on an individual basis. The minimum expectation is an undergraduate cumulative grade-point average of 3.0 out of 4.0 and a GPA of 3.0 for the senior year. All applicants whose native language is not English, including those who have earned degrees at U.S. institutions, must score at least 550 on the TOEFL exam to be considered for admission to the program.

Students who hold the B.S. or B.A. in a field other than electrical engineering are also expected to have a minimum cumulative grade-point average of 3.0 and a minimum senior year average of 3.0 in that field. These students should also have a background equivalent to that obtained by earning credit with a minimum 3.0 grade-point average in the Electrical Engineering courses normally taken at the 200 and 300 levels in the Bachelor's program in this department, and two senior Electrical Engineering courses in their area of interest. Students from other fields than electrical engineering who have met the admission standards except for this background will be admitted only as non-degree students until they have completed coursework to provide this background.

**Master's Degree Requirements**

Specific degree requirements which must be met include:

1. Electrical Engineering 503 and 504.
2. Six semester hours of graduate credit in mathematics consisting of mathematics courses of 400 level or higher which have been approved by the E.E. Graduate Committee.
3. An additional 12 semester hours of 500 level work in electrical engineering courses or 6 semester hours of 500-level work in one area of electrical engineering courses and 6 semester hours of 500-level work in another area. The 500-level work in electrical engineering courses must include at least 6 hours in the student's major area.
5. A final oral examination covering the thesis and related coursework.

**THE DOCTORAL PROGRAM**

The Ph.D. with a major in Electrical Engineering may be pursued in the concentration areas of circuit theory, computers, electronics, communication theory, electromagnetic theory, plasma engineering, power systems, solid-state electronics, and control systems. Applicants must submit scores on the General Graduate Record Exam. A TOEFL score of 550 is required for non-native speakers of English, including those who have earned degrees at U.S. institutions. Specific departmental requirements for the Ph.D. include the following:

1. A Master of Science or Master of Engineering degree.
2. A minimum of 48 semester hours of coursework beyond the B.S. excluding thesis, research, and dissertation work.
   a. A minimum of 24 semester hours of work in electrical engineering courses at the 500 and 600 levels.
   b. A minimum of 9 semester hours of 600-level coursework. At least 3 semester hours of this work must be in an area other than the student's major area.
   c. A minimum of 12 hours of mathematics courses approved by the Electrical Engineering Graduate Committee. All 12 hours must be 400-level or above, and at least 6 hours must be at 500-level or above.
3. One foreign language if the student's faculty committee feels that a reading knowledge of a foreign language is crucial to the student's research efforts.
4. Satisfactory performance on both a qualifying and comprehensive examination. The qualifying examination is prepared by the Electrical Engineering faculty and consists of a 3-hour written examination in each of four areas. Areas (1) mathematics and transform methods, and (2) basic electrical network analysis, are required of all Ph.D. students. Areas (3) and (4) are usually chosen from two of the graduate course divisions in the department and cover material from undergraduate courses and first year graduate courses. A student who fails the qualifying examination must take and pass the examination the next time it is offered in the Ph.D. program. The qualifying examination is normally taken after the completion of 24 hours of graduate coursework or immediately after completion of a master's degree. A minimum of 18 hours of graduate coursework must be completed after the student has taken the qualifying examination the first time.
5. A comprehensive examination is required by The Graduate School. In this department the comprehensive exam is administered by the student's committee; the exam results are reported to the graduate committee for approval, and the exam is filed in the department. The comprehensive exam is given when the student is ready to apply for admission to candidacy.

The exam consists of both written and oral parts. The written part consists of at least two sections: a complete review of the literature in the student's dissertation topic and a review of the major tools to be used in the dissertation work. The student's committee may require additional written sections. The student must demonstrate a mastery of the dissertation area, ability to think analytically and creatively, skill in using academic resources, and ability to complete the dissertation satisfactorily.

The oral part consists primarily of a professional presentation of a proposal for dissertation work and its defense. The committee may cover additional topics in the oral part.
6. Participation in departmental seminars.

Many of the electrical engineering courses are offered in the evening. Engineers working in industry are encouraged to participate in the department's graduate program. Departmental graduate programs are also available at the Space Institute, Tullahoma.
522 Power Systems Analysis II (3) Operation and control of interconnected power systems, transient and dynamic stability. Formulating and solving problems in matrix-vector form with application to large scale power systems. Prereq: 521.

523 Power Electronics and Drives (3) Forced commutated inverter circuits; current inverters, drive system modeling, vector and scalar control of induction machines, parameter variations, control principles of synchronous machine.


525 Advanced Electrical Machines I (3) Fundamental processes of electromechanical energy conversion; application in conventional devices. Differential equations for rotating machinery. Prereq: 422 or equivalent.

531 Analog Electronics I (3) Physical operation of modern electronic devices: semiconductor devices; diodes, bipolar transistors, J-FETs, and MOS-FETs. Small-signal equivalent circuits and noise models of active devices. Project laboratory. Prereq: 431, 432, 433, or consent of instructor.


559 Graduate Seminar I (1) Topics of interest discussed in weekly seminar. May be repeated. Maximum 6 hrs. S/NC or letter grade.

599 Special Topics I (1-3) May be repeated. Maximum 9 hrs.

600 Doctoral Research and Dissertation (3-15) Pr/NP hrs.


617 Special Topics in Systems Theory I (3) Topics of current interest to students and faculty: large scale models, model order reduction, algebraic and geometric system theories, and advanced design methods. Prereq: 503 and consent of instructor.

618 Special Topics in Systems Theory II (3) Topics of current interest to students and faculty: large scale models, model order reduction, algebraic and geometric system theories, and advanced design methods. Prereq: 503 and consent of instructor.


631 Advanced Topics in Electronic Instrumentation I (3) Based on particular interests of students. Fundamental physical processes in instrumentation transducers: thermoelectric, magnetoelectric, electromagnetic and optical devices. Prereq: 531-32 and consent of instructor.


643 Detection and Estimation Theory I (3) Detection theory; coding theory; system identification. Signals with unknown parameters; optimal filter and adaptive systems; sequential detection; suboptimal detection. Prereq: 504 or consent of instructor.


651 Computer-Aided Design of VLSI Systems I (3) Prereq: Consent of instructor. Review of basic digital electronics; computer architecture; algorithmic state machines; partitioning; structured design methodology. Prereq: 551-2 or consent of instructor.

652 Computer-Aided Design of VLSI Systems II (3) Computer-aided design tools; design and implementation of full custom very large scale integrated (VLSI) circuits. Design for testability; testing of fabricated chips. Prereq: 651.

653 Advanced Plasma Physics I (3) Basic concepts of high temperature plasma physics. Magneto-hydrodynamics and kinetic and diagnostic techniques of plasma, plasma transport, plasma waves, equilibrium, and stability. Prereq: Physics 541-2, 461-2 or 563-4, or consent of instructor. (Same as Physics 663.)

654 Advanced Plasma Physics II (3) Plasma heating and radiation phenomena, Advanced topics of current interest. Must be taken in sequence. Prereq: 663.

671 Image Processing and Robotics I (3) Three-dimensional scene modeling and information integration, multi-sensor systems. Prereq: 572 or 573 or consent of instructor.

672 Image Processing and Robotics II (3) Stereo vision, shape theory. Prereq: 671.

673 Image Processing and Robotics III (3) Time-varying imagery, path planning and navigation. Prereq: 672.

681-82 Quantum Electronics (3,3) Prereq: Consent of instructor.

691 Advanced Graduate Seminar (1) Research in department. May be repeated. S/NC or letter grade.

692 Special Topics I (1-3) Advanced topics of current interest to Ph.D. students in Electrical Engineering. May be repeated. Maximum 9 hrs.

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**Engineering Science**

See Mechanical and Aerospace Engineering and Engineering Science

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**English**

(Majors in Engineering Science)

MAJOR DEGREES

English..................................................M.A., Ph.D.

D. Allen Carroll, Head
Professors:
Adams, Percy G. (Emeritus), Ph.D. ........................................ Texas
Bratton, Edward W., Ph.D. .................................................. Illinois
Carroll, D. Allen, Ph.D. ................................................ North Carolina
Cowen, Don R., Ph.D. ....................................................... Missouri
Curry, Kenneth (Emeritus), Ph.D. .......................................... Yale
Drake, Robert Y., Jr., Ph.D. ................................................. Yale
Ensrud, Allen R., Ph.D. ....................................................... Indiana
Finneran, Richard J. (Hodges Chair of Excellence), Ph.D. ........ North Carolina
Fisher, John H. (Emeritus), Ph.D., Pennsylvania
Goslee, David F., Ph.D. ....................................................... Yale
Goslee, Nancy M. (Distinguished Prof.), Ph.D. ......................... Yale
Heffernan, Thomas J., Ph.D. ................................................. Cambridge
Kallet, Marilyn, Ph.D. ....................................................... Rutgers
Keene, Michael, Ph.D. ....................................................... Texas
Kelly, Richard M. (Lindsay Young Prof.), Ph.D. ....................... Texas

Assistant Professors:
Atwill, Janet, Ph.D. .......................................................... Purdue
Bensel-Myers, Linda D., Ph.D. .......................................... Oregon
Dumas, Bethany K., Ph.D. .................................................. Arkansas
Dunn, Allen, Ph.D. ............................................................ Washington
Gamer, Stanton B., Jr., Ph.D. ............................................. Princeton
Gill, J. E., Ph.D. ................................................................. North Carolina
Hutchinson, George, Ph.D. ....................................................... Duke
Jennings, LaVina, Ph.D. ..................................................... North Carolina
Papke, Mary E., Ph.D. ....................................................... Texas
Robinson, Frank K., Ph.D. ......................................................... Texas
Smith, Arthur, Ph.D. ............................................................ Houston
Stillman, Robert, Ph.D. ......................................................... Pennsylvania
Zemochick, John (Liaison), Ph.D. ......................................... Columbia

Associate Professors:
Bhatt, Rakesh, Ph.D. ........................................................... Illinois
Hammond, Patay, G., M.A. ................................................ Tennessee
Hirst, Russel, Ph.D. ............................................................. Rensselaer
Howes, Laura L., Ph.D. ........................................................ Columbia
Mostern, Kenneth, Ph.D. .................................................. Berkeley
Voss, Randi G., Ph.D. .......................................................... Texas

The Department of English offers the Master of Arts and the Doctor of Philosophy degrees with a major in English. Thesis and non-thesis options are available for the M.A. as well as a special concentration in writing. Detailed information about the master's and doctoral programs, and about individual graduate courses, may be obtained by writing the Director of Graduate Studies in English, 306 McClung Tower. A prospective student must contact the department to receive the proper information and forms with which to apply. The Department of English does not accept students in non-degree or provisional status. A student who wishes to enter the department must apply in degree-seeking status for her/his application to receive consideration for admission to any graduate program in English.

THE MASTER'S PROGRAM

Requirements
Coursework: A minimum of 24 semester hours in English beyond the B.A., to include 6 hours at the 600 level; 12 additional hours at the 500-600 level (Only 3 hours of 593 Independent Study may be applied toward the M.A.); and 6 hours for graduate credit at any level, including the 400 level. In this coursework, students must maintain at least a 3.0 GPA.

Thesis Option: Written under the direction of a faculty member of the department and approved by a committee of two other faculty members. Six semester hours of credit will be given.

Non-Thesis Option: Six hours of additional courses at the 500-600 level, making a total of 30 hours of required coursework.

Language Requirement: Evidence of proficiency in one foreign language, to be fulfilled in one of the following ways:
1. Completion of the second year of a language at college level with a grade of C or better.
2. Completion of French 302 or German 332 at UT Knoxville with a grade of B or better.
3. Passing of the regular Ph.D. foreign language examination as currently administered at UT Knoxville.

Final Examination: A candidate presenting a thesis must pass a one-hour oral examination; a candidate presenting a creative project must pass a ninety-minute oral examination. The examination consists of a short thesis defense, but chiefly of questions covering the general history of English and American literature, not merely the coursework taken. A reading list of primary works designed to help the student prepare for these questions is available in the office of the Director of Graduate Studies in English.

A non-thesis student must pass a written examination, followed by a one-hour oral examination, both consisting of the same sort of questions as the examination taken by the thesis student.

Residence Requirement: There is no residence requirement for the M.A., but students should attempt to pursue a full-time program whenever possible.

WRITING CONCENTRATION

The master's program with writing concentration is intended for those students who plan to do free-lance writing, specialize in teaching writing courses at the college level, or work as professional writers in business or industry.

Requirements
The requirements for the writing concentration are the same as those for the thesis option above with the following exceptions:

Coursework: Writing students may substitute two 400-level writing courses for two 500-level courses. Students must take at least 9 hours in writing and 6 in literature, the remaining 6 to be selected from any English courses at the proper level. Of the courses in writing, at least 3 hours must be taken at the 500 level; additional 500-level hours are strongly recommended.

Writing Projects: One of the following writing projects for six hours of credit:
1. A thesis, using research to analyze some aspect of writing or rhetorical theory.
2. A creative project, such as a collection of poems or short stories, a short novel, a play, or a creative work of non-fiction prose.

The nature and length of each project will be determined by the Director of Graduate Studies after consulting with the student and the project director. In addition to the director, two other English Department faculty members will supervise and approve the project; at least one should be from the literature faculty.

Final Examination: The reading list may be modified by the M.A. examining committee, meeting as a body with the student, to reflect the candidate's particular writing emphasis. However, most of the oral examination should focus upon the literature outlined in the original reading list.

THE DOCTORAL PROGRAM

Requirements
A student must successfully complete a program of study, normally 5 full semesters as outlined below, approved by the candidate's committees and the Director of Graduate Studies in English.

Coursework: At least 51 semester hours beyond the B.A. to include at least 21 semester hours at the 600 level; at least 15 semester hours at the 500 level or above (only 3 hours of 593 Independent Study may be applied toward the M.A. and 3 after the M.A.); a special three-hour course in teaching composition; and 12 additional hours at any level, including the 400 level. Up to 6 of these additional hours may be taken in some cognate field or fields such as history, philosophy, French. These courses must be drawn from those approved for graduate credit. All other coursework must be in the English department. In this coursework, students must normally maintain a 3.5 GPA.

Dissertation: Twenty-four semester hours of dissertation. These represent the research and writing of the dissertation. The research and dissertation will be directed by a faculty member of the department and approved by a doctoral committee of three or four other faculty members.

Language Requirement: A language requirement is met in one of the following ways:
1. Two languages approved by the Director of Graduate Studies in English. The requirement for each language may be fulfilled by (a) completion of French 302 or German 332 with a grade of B or better; (b) completion at UT Knoxville of any two courses on the 300 level or above in the foreign language or literature with at least a grade of B in each course; (c) passing of the regular Ph.D. foreign language examination as currently administered at UT Knoxville.
2. One modern language approved by the Director of Graduate Studies in English. This requirement must be fulfilled by a passing grade on the language examination given by UT Knoxville and completion of two courses given in the foreign language at the 400 level or above, at least one course to be at the 500 or
Examinations: (1) A 4-hour qualifying examination taken before the end of the first year of Ph.D. coursework; this examination is given three times a year, with the M.A. written examination. (2) A comprehensive written examination which may be divided as the department directs; see the English Department graduate brochure. The comprehensive examination is given twice a year, normally in March and September. Before a student may take it, he/she must have completed all coursework required. A student must also have met all requirements for foreign languages before taking the first part of the examination.

Dissertation Defense: A one-hour examination on the dissertation and other related areas.

Residence Requirement: Two consecutive semesters as a full-time student. For students not on teaching assistantships, full-time consists of 9 or more hours of coursework and/or dissertation hours each semester. For students on assistantships, full-time consists of at least 6 hours of courses and/or dissertation hours and 3 hours of teaching each semester.

GRADUATE COURSES

Note: Students enrolling in English graduate courses must first register in the office of the Director of Graduate Studies in 306 McClung Tower.

401 Medieval Literature: Reading and analysis of selected medieval literary masterpieces in modern English.

402 Chaucer: Reading and analysis of Canterbury Tales and Troilus and Criseyde in Middle English.

404 Shakespeare I: Early Plays: Shakespeare's dramatic achievement before 1600. Reading and discussion of selected plays from romantic comedies, including Twelfth Night; English histories, including Henry IV, and early tragedy, including Hamlet.

405 Shakespeare II: Later Plays: Shakespeare's dramatic achievement between 1601 and 1613. Reading and discussion of selected plays from romantic comedies, including Troilus and Cressida, and tragicomedies, including Othello; problem plays, including Measure for Measure, and dramatic romances, including The Tempest.

406 Renaissance Drama: English theatre between 1550 and 1640 through reading of representative plays by Shakespeare's contemporaries: Marlowe, Webster, Jonson.

409 Spenser and his Contemporaries: Principal achievements in prose and poetry of sixteenth century authors: Spenser, Wyatt, Marlowe, More, Sidney, and Bacon.


412 Literature of the Later Eighteenth Century: Johnson to Burns: Survey of English literature and culture from 1750 to 1800.

413 Restoration and Eighteenth-Century Genres and Modes: A major genre or literary mode: romance, novel, poetry, non-fiction prose, satire, or epic, written between 1660 and 1800. May be repeated.


415 Romantic Poetry and Prose II: Keats, Shelley, and Byron: readings from Hazlitt, Peacock, and other prose writers.


419 Victorian Poetry and Prose: Browning, Arnold, Hopkins, Hardy, Ruskin, Darwin, and Wilde.

420 The Nineteenth-Century British Novel: Scott to Hardy.

421 Modern British Novel: Lawrence, Joyce, and Woolf.

422 Women Writers in Britain: Literary consciousness and works of women writers in Britain. Topics vary: Jane Austen, George Eliot, George Bernard Shaw, Woolf.

429 Twentieth-Century British Novel: Joyce, Beckett, and other writers of the century.

430 American Novels: Readings in American fiction and non-fiction prose, satire, and poetry.

431 Colonial, Federal, and Early National American Literature: From Columbus to Washington Irving.

432 American Romanticism and Transcendentalism.

433 American Realism and Naturalism.

434 Modern American Literature: World War I to present.

435 American Novel before 1900: From earliest sentimental novels through Brown and Cooper, and major figures to 1900: Hawthorne, Melville, Stowe, Clemens, and James.


440 Modern American Drama: Readings in modern American dramatic literature.

442 American Humor: Readings in American humor, including Twentieth-Century American humorists.

443 American Humor: Readings in American humor, including Twentieth-Century American humorists.

460 Technical Editing: Editing technical material for publication. Principles of style, format, graphics, layout, and production management. Prereq: 456 and 459, or consent of instructor.

461 Advanced Technical and Professional Writing: For students planning careers in industry, education, and government who need technical writing skills. Writing of proposals, process descriptions, set of instructions, descriptions of mechanisms, recommendation reports, abstracts, proposals, and major reports. Prereq: Junior standing in student's major or consent of instructor.

462 Writing for Publication: Principles and practices of writing for publication. Dissertation, theses, articles, and reports in science and technology. Prereq: 459 or consent of instructor.

463 Advanced Poetry Writing: Further development of skills acquired in basic writing poetry course. Prereq: 363 or consent of instructor.

464 Advanced Fiction Writing: Further development of skills acquired in basic writing fiction course. Prereq: 363 or consent of instructor.

471 Sociolinguistics: Study of language in relation to society. Empirical and theoretical focus. Large-scale units: tribes, nations, social groups. Prereq: 371 or 372 or Linguistics 200 or consent of instructor. (Same as Linguistics 471 and Sociology 471.)

472 American English: Phonological, morphological, and syntactic characteristics of major regional varieties of American English: origins, functions, and implications for cultural pluralism. Prereq: 371 or 372 or Linguistics 200 or consent of instructor. (Same as Linguistics 472.)

474 Teaching English as a Second or Foreign Language: Grammar of English: particular grammatical difficulties of non-native learners. Prereq: 200 or consent of instructor. (Same as Linguistics 474.)

475 Teaching English as a Second or Foreign Language II: Second language acquisition theory, issues in teaching four language skills to learners of English. Prereq: 474. (Same as Linguistics 475.)

476 Second Language Acquisition: Theoretical models of second language acquisition; differences between first and second language acquisition; affect of age; cognitive factors in second language acquisition; learner variability. Prereq: 474. (Same as Linguistics 476.)

479 Literary Criticism: Historical survey of major works of literary criticism.

480 British and American Ballad and Folktale: Popular ballads and folktales of English, Scottish, and Northern American tradition.

481 Studies in Folklore: Topics vary. May be repeated with different topics. Maximum 6 hrs.

482 Major Authors: Content varies. Concentrated study of one of the most influential writers in British or American literary history: e.g., Donne, Tennyson, Auden, Aiken, Whitman, Faulkner, Baldwin, Lawrance.

483 Special Topics in Literature: Topics vary. May be repeated. Maximum 6 hrs.

484 Special Topics in Writing: Original writing integrated with reading, usually taught by professional author. Topics vary. May be repeated. Maximum 6 hrs.

485 Special Topics in Language: Topics vary. May be repeated. Maximum 6 hrs with consent of department. (Same as Linguistics 485.)

486 Special Topics in Criticism: Topics vary. Theoretical and practical approaches to British and American literature. May be repeated with consent of department. Maximum 6 hrs.

489 Special Topics in Film: Topics vary. Particularly directors, film genres, national cinema movements, or
500 Thesis (1-15) P/NC only. E

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

505 Teaching Freshman Composition (3) Introduction to teaching Freshman English through study of various techniques and philosophies of composition. Required of all first-year teaching associates.

506 Introduction to Literary Research (3) Critical examination of aims of English studies, profession of English teacher, theory of literature, and methods of research: collecting of information, evaluation of material, and transmitting of results of scholarship.

507 Applied Criticism: The Rhetoric of Literary Forms (3) Study and application of ways in which major critics have analyzed form in poetry and prose fiction.

510 History of the English Language I (3) Phonological, morphological, and syntactic development of English language: Old and Middle English. F.A

511 History of the English Language II (3) Phonological, morphological, and syntactic development of the English language with concentration on developments after 1500, especially in American English. Sp.A

513-14 Readings in Medieval Literature (3,3) Reading and analysis of selected masterpieces of Old and Middle English literature and their Continental sources in Modern English.

520-21 Readings and Analysis in Selected Areas of Sixteenth- and Seventeenth-Century Prose, Poetry, and Drama (3,3) Content varies: genre, theme, literary movement, or other coherent emphasis.

530-31 Readings in English Literature of the Restoration and Eighteenth Century (3,3) Topics vary: genre, poetry, prose, drama, or period. Restoration, early eighteenth century, late eighteenth century.

540-41 Readings in English Literature of the Nineteenth Century I and II (3,3) Content varies: genre, theme, literary movement, or other coherent emphasis.

550-51 Readings in American Literature from the Colonial Period to the Present (3,3) Content varies: genre, theme, literary movement, or other coherent emphasis.

552 Readings in Black American Literature (3) Content varies: genre, theme, literary movement, or other coherent emphasis.

560-61 Readings in Twentieth-Century Literature (3,3) Content varies: genre, theme, literary movement, or other coherent emphasis.

576 Introduction to Contemporary Criticism (3) Introductory survey of twentieth-century literary criticism from New Criticism to present.

580 Fiction Writing (3) Advanced fiction projects under supervision of instructor and time for independent study. Prereq: Extensive proficiency in reading and writing fiction.

581 Colloquium in Poetry Writing (3) Major poetic project or continuation of project begun in 463. Individual consultation with instructor supplement class analysis; readings in contemporary poetry and theory. Prereq: 463 or consent of instructor.

582 Special Topics in Writing (1-3) Topics vary. May be repeated. Maximum 6 hrs. Enrollment by consent of director of graduate studies only.

585 Issues in Invention, Style, and Audience (3) Theoretical perspectives on contemporary research in rhetoric and composition.

586 History of Rhetoric I (3) Survey of rhetoric from Sophocles to Ristamus.

587 History of Rhetoric II (3) Survey of rhetoric from Bacon to present.

588 Readings in Applied Rhetoric (3) Content varies: readings across curriculum, writing centers, technical communication, text linguistics.

590 Topics in Critical Theory (3) Topics vary.

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

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

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

594 Film History, Rhetoric, and Analysis (3) Film as a narrative art form: historical development of film; the "rhetoric" of film; critical approaches to film study: genre, author, formalist, and historical; critical analysis of individual films.

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

610 Studies in Old English Language and Literature (3) Old English grammar with readings in prose and poetry. F.A

611 Studies in Beowulf (3) Translation and critical study of Beowulf. Prereq: English 610 or consent of instructor. Sp.A

620 Studies in Medieval English Literature (3) Seminar in literature and literary genres of Medieval English literature, read in Old and Middle English. Subject matter varies from year to year.

621 Studies in Chaucer (3) Seminar in text, interpretation, and criticism of Chaucer's writings. Prereq: Previous course in Chaucer.


640-41 Studies in Restoration and Eighteenth-Century Literature (3,3) Topics vary: Swift, satire, restoration literature, Johnson and Boswell, Addison and Steele, restoration drama, Dryden.

650 Studies in English Romanticism (3) Seminar content varies: particular literary figure or figures, genres, themes, or other coherent focus.

651-52 Studies in Victorian Literature (3,3) Seminar content varies: particular literary figure or figures, genres, theme, or other coherent focus.

660-61-62 Studies in American Literature (3,3,3) Seminar content varies: particular literary figure or figures, genres, theme, or other coherent focus.

670-71-72 Studies in Twentieth-Century Literature (3,3,3) Seminar content varies: particular literary figure or figures, genres, themes, or other coherent focus.

680 Topics in English Language (3) May be repeated with consent of director of graduate studies. Maximum 9 hrs.


686 Studies in Creative Writing (3) Content varies: Connection between theory and practice in writing.

688 Studies in Literary Criticism (3) Content varies: Advanced work in the theory and history of literary criticism.

690 Special Topics (3) Content varies: History of Ideas, humor, biography, autobiography, extra-literary disciplines.
required but may be selected at the option of the student. The minor will include at least 6 hours and not more than 10 hours of graduate-level credit in the minor department. The student’s committee shall include a member of the faculty from the minor department to assist in designating courses required for the minor.

GRADUATE COURSES

410 Diseases and Insects of Ornamental Plants (2) Symptoms, identification and management of diseases and insect pests that affect plants in greenhouse, nursery, and landscape environments. Prereq: Plant Pathology or Economic Entomology or consent of instructor. Sp.

S00 Thesis (1-15) P/NP only. E

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

510 Plant Disease Fungi (4) Morphology, taxonomy, biology, and genetics of plant pathogenic fungi; isolation and identification of plant pathogenic fungi. Prereq: 313 or consent of instructor. 2 hrs and 2 labs. (Same as Ornamental Horticulture and Landscape Science 511.) F, A

512 Soilborne Plant Pathogens (3) Causal agents; host-parasite-soil environment interactions; epidemiology; and biological, cultural, and chemical control. Prereq: Plant Pathology or consent of instructor. 2 hrs and 1 lab. F, A

514 Bacterial Plant Diseases (4) Morphology, taxonomy, ecology, physiology, and genetics of bacterial plant pathogens; infection and disease development; pathogenesis and resistance; diagnosis; detection, effect of environment, and management of bacterial plant diseases; beneficial plant-bacterial interactions. Prereq: Plant Pathology or consent of instructor. 2 hrs and 1 lab. F, A

515 Physiology of Plant Disease (3) Biochemical and physiological events involved in host-parasite interactions. Mechanisms of disease resistance. Prereq: Introductory plant physiology or pathology, or consent of instructor. F

520 Plant Parasitic Nematodes (4) Morphology, taxonomy, ecology, and management of plant parasitic nematodes, host-parasite relationships, aere: 5 hrs biological science or consent of instructor. 2 hrs and 2 labs. Sp.

521 Plant Virology (3) Symptomatology, epidemiology, and management of virus infection; structure, morphology, replication, transmission, purification, characterization, and classification of plant viruses; virology; plant pathogenic viroids, mycoplasmas and spiroplasmas. Prereq: 313 or consent of instructor. 2 hrs and 1 lab. Sp.

523 Field Crop and Vegetable Insects (2) Identification, biology and management of insects affecting commercial vegetable and home garden crops. Prereq: 321 or basic entomology course. 1 hr and 1 lab. F, A

525 Medical and Veterinary Entomology (3) Morphology, taxonomy, biology and control of arthropod parasites and vectors of pathogens of humans and animals. Ecology and behavior of vectors in relation to pathogen transmission and control. Prereq: 321 or 325, or consent of instructor. 2 hrs and 1 lab. Sp.

530 Integrated Pest Management (3) Principles and application of biological, cultural, genetic, behavioral, and chemical methods of control to maintain pest populations below economic threshold levels. Prereq: 321 or consent of instructor. (Same as Plant and Soil Science 530.) F, A

531 Special Problems in Entomology (1-3) Comprehensive individual study of current problems. May be repeated. Maximum 6 hrs. E

532 Special Problems in Plant Pathology (1-4) Comprehensive individual study of current problems. May be repeated. Maximum 6 hrs. E

533 Concentrated Study in Entomology (1-3) Selected subjects in entomology for advanced students, concentrated in time and subject matter. Prereq: 321 or basic entomology course. May be repeated. Maximum 6 hrs. F, Sp

541 Seminar (1) Review of literature and current research in entomology and plant pathology. May be repeated. Maximum 2 hrs. E

Environmental Engineering

See Civil Engineering

Exercise Science (College of Education)

MAJORS DEGREES

Education Ph.D.

Human Performance and Sport Studies M.S., Ed.D.

E. Howley, Leader

Professors:

Caper, Edward K. (Emeritus), Ph.D. .......... Iowa

Howley, Edward T., Ph.D. ................. Wisconsin

Kozar, Andrew J. (University Prof.), Ph.D. Michigan

Liemohn, W. P., Ph.D. ..................... Iowa

Rockett, Ian R. H., Ph.D. .................. Brown

Welch, Hugh (Emeritus), Ph.D. .......... Florida

Associate Professor:

Bassett, David R., Jr., Ph.D. ............. Wisconsin

Assistant Professors:

Thompson, Dixie, Ph.D. ................. Missouri

Zhang, Sengning, Ph.D. ................. Oregon

The Exercise Science unit offers graduate programs leading to the Master of Science with a major in Human Performance and Sport Studies, concentration in exercise science (exercise physiology/fitness, kinesiology/sports medicine); Doctor of Education with a major in Human Performance and Sport Studies; and the Doctor of Philosophy with a major in Education. See Education under Fields of Instruction for full description of all degree requirements.

Specific questions about these programs should be directed to the leader of the unit.

ADMISSION REQUIREMENTS

Applicants are required to complete the unit application which will be sent to all persons upon their initial inquiry about the program. This is in addition to The Graduate School application.

The following retention policy applies to all graduate students seeking a degree in the Exercise Science unit:

1. Graduate students are required to maintain an overall 3.0 GPA.

2. Any student who fails below this standard will be advised in writing by the unit leader of the need to discuss the matter with his/her advisor.

3. If a student’s overall GPA remains below 3.0 for a second semester, the student will have his/her degree status revoked.

GRADUATE ASSISTANTSHIPS

A limited number of graduate assistantships are available for qualified women and men who are graduates of accredited colleges or universities. These assistantships are open to students in the master’s and doctoral programs. Students interested in these opportunities should file their applications by February 1. Letters should be addressed to Graduate Assistantships Coordinator, Exercise Science Unit, The University of Tennessee, Knoxville, TN 37996-2700.

GRADUATE COURSES

480 Physiology of Exercise (3) Functions of body in response to physical activity, including physiological aspects of fatigue, training, and adaptation to environment. Prereq: Human Physiology or general physiology. 2 hrs and 1 lab. (Same as Biochemistry and Cellular and Molecular Biology 480.)

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

501 Special Project (3) Culminating experience for non-thesis major. Research study suitable for publication, or practicum requiring special written work. Prereq: Sport Management 532.

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


509 Graduate Seminar in Public Health (1) (Same as Public Health 509, Nutrition 509, Nursing 509 and Social Work 509.)


513 Biomechanics of Orthopaedic Rehabilitation (3) Effect of physical activity on bone and soft tissue development, anatomical and mechanical implications of exercise, theoretical bases for rehabilitative programs.

516 Therapeutic Exercise (3) Therapeutic exercise programs designed for specific pathologies: McKenzie, muscular spasticity, based on specific biomechanical considerations; eccentric, closed kinetic chain; and more general in nature: Feldenkrais, myofascial release.

531 Biomechanics of Human Performance (3) Human movement: teaching, coaching and sports medicine. Prereq: 422 or equivalent.

541 Special Topics (1-3) Advanced study in selected disciplinary or professional areas of physical education and/or sport. May be repeated.

563 Laboratory Techniques in Exercise Physiology (3) Laboratory course in experimental methodology and instrumentation: respiratory and metabolic measurements, blood chemistry, and gas analysis. Prereq: 480.

565 Advanced Physiology of Exercise (3) Quantitative approach to current and classical questions in exercise physiology. Prereq: 480 and 563.


568 Physical Activity and Positive Health (3) Review of clinical, epidemiological, and experimental evidence concerning relationship and effects of exercise on health-related components of fitness. Prereq: Elementary statistics, 480 and 414 or equivalents. (Same as Public Health 568.)

569 Fitness Testing, Programming, and Leadership for Diverse Populations (2) Clinical experience in selecting, administering, and evaluating exercise tolerance tests on cycle ergometer and treadmill. Individual fitness programs for diverse populations. Practice in leading
variety of activities aimed at improved fitness. Prereq: 480 and 414. (Same as Public Health 569.)

570 Cardiac Rehabilitation Practicum (1-3) Supervised experience in hospital-based exercise programs for participants with cardiac and/or pulmonary disorders. Use of telemetry monitoring, leading safe exercise regimens counseling participants on safe exercise guidelines. Presenting educational class on topic applicable to participants. Prereq: 480 and 567. Coreq: 569.

585 Seminar in Gerontology (1) (Same as Human Ecology 585, Counseling and Education and Counseling Psychology 585, Nursing 586, Public Health 586, Psychological Studies 586, Social Work 585, and Sociology 585.)

593 Independent Study (1-3) May be repeated. S/NC or letter grade. E

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

601 Research Seminar in Exercise Science (1) Research topics in different aspects of exercise science. May be repeated. S/NC only.

622 Directed Independent Research (3-6) Prereq: Doctoral student or consent of instructor. May be repeated. S/NC or letter grade.

661 Seminar in Exercise and Applied Physiology (1) Selected topics in exercise and environmental physiology. Prereq: 563 and 565. May be repeated with consent of instructor.

664 Research Participation in Applied Physiology (1-6) Participation in research with faculty member whose interests coincide with those of student. S/NC only.

681 Practicum (1-3) Intern experience in areas of major interest. May be repeated.

693 Independent Study (1-3) May be repeated. S/NC or letter grade. E

## Finance

(College of Business Administration)

### MAJOR

**DEGREES**

Business Administration ............... MBA, Ph.D.

James W. Wansley, Head

Professors:

Black, Harold A. (James F. Smith, Jr., Prof.), Ph.D. ............... Ohio State
Boehm, T. P., Ph.D. ............... Washington (St. Louis)
Dorotewich, William W. (Emeritus.), Ph.D. ............... New York
Ehrhardt, M. C., Ph.D. ............... Georgia Tech
Philippatos, G. C. (Distinguished Prof.), Ph.D. ............... New York
Striehers, Ronald E. (Wm. Voigt Scholar), Ph.D. ............... UCLA
Wachnowicz, J. M., Jr., CPA, Ph.D. ............... Illinois
Wansley, James W. (Clayton Chair of Excellence) (Liaison), CFA, Ph.D. ............... South Carolina

Associate Professors:

Axier, A. L., Ph.D. ............... Iowa
Collins, M. Cary, Ph.D. ............... Georgia
Daves, Philip R., Ph.D. ............... North Carolina
Duggan, R. P., Ph.D. ............... Ohio State

Assistant Professors:

Gunther, Deborah L., Ph.D. ............... Florida
Stern, Mitchell B., Ph.D. ............... Virginia

### BUSINESS ADMINISTRATION CONCENTRATIONS

For complete listing of MBA and Ph.D. program requirements, see Business Administration.

**MBA Concentration:** Finance.

The curriculum offers courses for those interested in careers in corporate financial management, security analysis and investments, banking and financial institutions, and real estate.

Minimum course requirements are three courses: 510 (3 hours), plus two from the following: 512, 522, 532, 551, and 551.

**Ph.D. Concentration:** Finance.

Minimum course requirements are finance seminars 641, 642, 651, 652.

### GRADUATE COURSES

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

510 Contemporary Concepts and Methods in Finance (6) Strategic issues and broad-based valuation concepts in finance; integrative approach to investments, corporate finance and institutions areas. Prereq: Business Administration 504 and 505 or consent of instructor.

512 Problems in Financial Management (3) Readings and cases that apply finance theory to real-world investment, financing, and asset management problems. Prereq: Business Administration 504 and 505 or consent of instructor.

522 Portfolio Analysis and Management (3) Portfolio theory and evidence of behavior of security returns with view to determining national investment policy. Statistical analysis of risk and return of portfolios, portfolio evaluation and revision, capital market theory and extensions of portfolio analysis. Prereq: Business Administration 504 and 505 or consent of instructor.

532 Financial Institutions (3) Analysis of management policies of financial institutions; asset, liability and capital management. Legal, economic and regulatory environment and implications for management. Financial institution structure and competition and changing trends in U.S. financial system. Prereq: Business Administration 504 and 505 or consent of instructor.

551 Financial Management of a New Enterprise (3) Financial issues associated with formation, control, and long-term planning of new enterprise. Acquisition of venture capital. Prereq: Business Administration 504 and 505 or consent of instructor.

581 Real Estate Investment and Finance (3) Financial and market analysis used to make real estate investment decisions. Effects of variety of financing options on rate of return on income-producing properties. Effect of various financing options on consumer's decisions to purchase, relationship between primary and secondary mortgage markets and impact of changes in mortgage rates on cost of availability of funds for real estate lending. Effects of government intervention (taxation, subsidization, and regulation) both in real estate and mortgage markets. Prereq: Business Administration 504 and 505 or consent of instructor.

599 Special Topics in Finance (1-3) Topics vary. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

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

641 Seminar in Finance I: Capital Markets (3) Capital markets, capital market imperfections, and market dynamics. Interest rate and term structure of interest rates. Interest rate theory, macroeconomic theory, the capital asset pricing model, asset pricing, efficient market hypothesis, interest rate theory, financial market micro structure.

642 Seminar in Finance II: Theory of the Firm (3) Financial theory and financial decision making under conditions of uncertainty, equilibrium models of firm. Option pricing, agency theory, capital structure, economics of information, and dividend policy.

651 Advanced Seminar in Finance I (3) Recent theoretical and empirical developments in micro-finance literature. Topics vary. May be repeated. Maximum 6 hrs.

652 Advanced Seminar in Finance II (3) Recent theoretical and empirical developments in micro-finance literature. Topics vary. May be repeated. Maximum 6 hrs.

### Food Science and Technology

(College of Agricultural Sciences and Natural Resources)

**MAJOR DEGREES**

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

Clark J. Brekke, Head

Professors:

Brekke, C. J., Ph.D. ............... Wisconsin
Collins, J. L., Ph.D. ............... Maryland
Draughon, F. A., Ph.D. ............... Georgia
Jaynes, H. O. (Emeritus), Ph.D. ............... Illinois
Malton, S. L., Ph.D. ............... Tennessee
Miles, J. T. (Emeritus), Ph.D. ............... Wisconsin
Overcast, W. W. (Emeritus), Ph.D. ............... Iowa State
Penfield, M. P. (Liaison), Ph.D. ............... Tennessee

Associate Professors:

Christen, G. E., Ph.D. ............... Missouri
Loveday, H. D., Ph.D. ............... Kansas State
Mount, J. R., Ph.D. ............... Ohio State

Assistant Professor:

Golden, D. A., Ph.D. ............... Georgia
Hulbert, G., Ph.D. ............... Illinois
van Laack, R. L., Ph.D. ............... Utrecht

The Department of Food Science and Technology offers the Master of Science and Doctor of Philosophy degrees. Students in the doctoral program may choose research in the concentration area of food products, food chemistry, food microbiology, or sensory evaluation of foods. Commodity interests (meats, dairy, fruits, vegetables, bakery products) can be emphasized in any of the areas by careful selection of courses and the research topic. Minors are available in cognate fields. For detailed information, contact the department head.

Graduate School rating forms or letters of recommendation from at least three people are required. Respondents should be familiar with the applicant's scholastic ability and professional potential.

### THE MASTER'S PROGRAM

Applicants must have a B.S. in food technology, food science or related scientific field.

**Thesis Option**

1. Prior to research for the thesis, the student must develop a detailed written research plan. Registration for 6 hours of 500 Thesis is required.
2. In addition to the thesis requirement, a minimum of 24 semester hours of graduate coursework is required. This work must be approved by the student's committee and a minimum of 14 hours must be courses numbered above 500. The committee may require additional coursework if the student's progress or background indicates such need.

3. All students are required to take 2 hours of 501 Seminar in their program and are expected to attend this course and participate in discussions during their master's program. Completion of 510 or equivalent is also required.

4. An oral, final examination covering the thesis and coursework is required.

**Non-Thesis Option**

1. In lieu of a thesis, students are required to complete a problem in cooperation with their employer (company or governmental agency) and their faculty committee. Students working on a problem must register for 6 hours of 503. In addition to the requirement for 6 hours of 503, a minimum of 24 semester hours of graduate coursework is required. This work must be approved by the student's committee and a minimum of 14 hours must be courses numbered above 500. The committee may require additional coursework if the student's progress or background indicates such need.

2. All students are required to take 2 hours of 501 Seminar in their program and are expected to attend this course and participate in discussions during their master's program. Completion of 510 or equivalent is also required.

3. Students will be required to take a written comprehensive examination covering their coursework. In addition, an oral, final examination covering the problem and coursework is required. The oral examination will be held on the Knoxville campus.

**THE DOCTORAL PROGRAM**

1. Completion of a master's degree in the field, or a closely related field, or passing a special qualifying examination is required for admission. Scores on the GRE aptitude test are also required.


3. A minimum of 72 hours beyond the Bachelor's degree, excluding credit for the master's thesis, is required. Of this, 24 semester hours must be 600 Doctoral Research and Dissertation.

4. At least 24 hours of coursework numbered above 500 are required exclusive of doctoral research and dissertation. At least 6 of the 24 hours must be courses numbered above 600.

5. A minimum of 6 hours of courses for graduate credit must be taken outside the Department of Food Science and Technology.

6. All candidates must complete 601 (2 hrs.) and are expected to attend 601 during their Ph.D. program.

7. Each candidate must pass both written and oral comprehensive examinations prior to admission to candidacy. Major professors will advise candidates on competencies expected. A final oral examination is required that includes a defense of the dissertation and subject matter that the student's committee considers appropriate.

**GRADUATE COURSES**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Description</th>
<th>Prerequisites</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>430</td>
<td>Sensory Evaluation of Food (3) Principles and methods of sensory evaluation of foods.</td>
<td></td>
<td>Basic statistics, 2 hrs and 1 lab.</td>
<td>3 hrs</td>
</tr>
<tr>
<td>452</td>
<td>Science of Dairy Foods (3) Science and technology of processing of milk and its products.</td>
<td></td>
<td>Pre: Food Chemistry, Food Law and Regulations, Food Microbiology and Lab, and Food Preservation or consent of instructor.</td>
<td>3 hrs</td>
</tr>
<tr>
<td>460</td>
<td>Meat Science (3) Carcass characteristics of meats, muscle structure and composition, cut</td>
<td></td>
<td>Pre: Food Chemistry or consent of instructor.</td>
<td>3 hrs</td>
</tr>
<tr>
<td>469</td>
<td>Meat Science Lab (1) Slaughter and processing methods for beef, pork, lamb and poultry.</td>
<td></td>
<td></td>
<td>1 lab.</td>
</tr>
<tr>
<td>470</td>
<td>Food Crop Products (3) Food products from plants; types, manufacturing systems, quality</td>
<td></td>
<td>Pre: Food Preservation and 3 hrs biological science or consent of instructor.</td>
<td>3 hrs</td>
</tr>
<tr>
<td>480</td>
<td>Cereal Science and Bakery Products (3) Chemistry and technology of processing cereal grains,</td>
<td></td>
<td>Pre: Food Chemistry or Food Microbiology or consent of instructor.</td>
<td>3 hrs</td>
</tr>
<tr>
<td>495</td>
<td>Food Processing System Analysis and Evaluation (3) Design and evaluation of food processing</td>
<td></td>
<td>Pre: Food Chemistry or Food Microbiology or consent of instructor.</td>
<td>3 hrs</td>
</tr>
<tr>
<td>500</td>
<td>Thesis (1-15) P/NP only. E</td>
<td></td>
<td></td>
<td>E</td>
</tr>
<tr>
<td>501</td>
<td>Seminar (1) Individual reports and discussion on topics from current literature. May be</td>
<td></td>
<td>Pre: Food Chemistry or Food Microbiology or consent of instructor.</td>
<td>3 hrs</td>
</tr>
<tr>
<td>502</td>
<td>Registration for Use of Facilities (3-15) Required for the student not otherwise registered</td>
<td></td>
<td>Pre: Food Chemistry or Food Microbiology or consent of instructor.</td>
<td>3 hrs</td>
</tr>
<tr>
<td>503</td>
<td>Problems in Lieu of Thesis (2-3) May be repeated.</td>
<td></td>
<td>Pre: Food Chemistry or Food Microbiology or consent of instructor.</td>
<td>3 hrs</td>
</tr>
<tr>
<td>510</td>
<td>Instrumental Analysis of Food (3) Modern instrumental methods for control of food manufacturing</td>
<td></td>
<td>Pre: Food Chemistry. 2 hrs and 1 lab.</td>
<td>3 hrs</td>
</tr>
<tr>
<td>511</td>
<td>Color and Flavor of Foods (3) Chemical basis, measurement, and reactions involved in color and</td>
<td></td>
<td>Pre: Food Chemistry. 2 hrs and 1 lab.</td>
<td>3 hrs</td>
</tr>
<tr>
<td>520</td>
<td>Food and Industrial Fermentations (3) Microbiology, biochemistry and technology of food-related</td>
<td></td>
<td>Pre: Food Chemistry or Food Microbiology or consent of instructor.</td>
<td>3 hrs</td>
</tr>
<tr>
<td>521</td>
<td>Advanced Food Microbiology (3) Microorganisms in foods, their identification, colonization, and</td>
<td></td>
<td>Pre: Food Chemistry or Food Microbiology or consent of instructor.</td>
<td>3 hrs</td>
</tr>
<tr>
<td>540</td>
<td>Food Product Development (3) Art, science and technology of developing and marketing new food</td>
<td></td>
<td>Pre: Food Chemistry. 2 hrs and 1 lab.</td>
<td>3 hrs</td>
</tr>
<tr>
<td>550</td>
<td>Advanced Meat Science (3) Chemical and physical changes that occur in conversion of muscle to</td>
<td></td>
<td>Pre: Food Chemistry. 2 hrs and 1 lab.</td>
<td>3 hrs</td>
</tr>
<tr>
<td>580</td>
<td>Oilseed Products (3) Chemistry and technology of foods and food ingredients produced from</td>
<td></td>
<td>Pre: Food Chemistry or Food Microbiology or consent of instructor.</td>
<td>3 hrs</td>
</tr>
</tbody>
</table>

**Forestry, Wildlife and Fisheries**

(College of Agricultural Sciences and Natural Resources)

**MAJORS**

<table>
<thead>
<tr>
<th>Major</th>
<th>Degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forestry</td>
<td>M.S.</td>
</tr>
<tr>
<td>Wildlife and Fisheries Science</td>
<td>M.S.</td>
</tr>
<tr>
<td>George M. Hopper, Head</td>
<td></td>
</tr>
</tbody>
</table>

**Professors:**

Barrett, J. W. (Emeritus), Ph.D.........Syracuse
Buckner, E. R. (Distinguished Prof.), Ph.D. .................NC State
Core, H. A. (Emeritus), Ph.D. .................Syracuse
Deardorff, B. L., Ph.D. ...............Colorado State
Dimmick, R. W., Ph.D. .................Wyoming
Hilly, T. K., Ph.D. ..............Auburn
Hopper, G. M., Ph.D. .................VPI
McGee, C. E. (Adjunct), D.F. .........Duke
Ostermeyer, D. M., Ph.D. ...............Syracuse
Petrun, M. R., Ph.D. .................Georgia
Rennie, J. C., Ph.D. .................NC State
Schneider, G. P., Ph.D. .................Michigan
Sharp, J. B. (Emeritus), D.P.A. .......Harvard
Smalley, G. (Adjunct), Ph.D. ........Tennessee
Strange, R. J., Ph.D. ..............Oregon State
Stumbo, D. A. (Emeritus), Ph.D. .......Minnesota
Thor, E. (Emeritus), Ph.D. ...........North Carolina State
Wilson, J. L., Ph.D. .................Tennessee

**Associate Professors:**

Hay, R. L., Ph.D. .........................Duke
King, M. M., Ph.D. ......................Utah State
Nodvin, S. C. (Adjunct), Ph.D. ........Cornell
Schlaubum, S. E., Ph.D. .................Colorado State
Smith, K. G. (Adjunct), Ph.D. ........Utah State
Wells, G. R. (Liaison), D.F. ...........Duke
Winstoner, P. M., Ph.D. ...............Iowa State

**Assistant Professors:**

Buehler, D. A., Ph.D. .................VPI
Clark, J. D. (Adjunct), Ph.D. ........Arkansas
Fly, J. M., Ph.D. ........................Michigan
Smith, E. R. (Adjunct), Ph.D. ........Tennessee
VanMiegroet, H. (Adjunct), Ph.D. ....Washington
Waldrop, T. A. (Adjunct), Ph.D. ......Tennessee

Graduate study leading to the Master of Science with majors in Forestry and in Wildlife
and Fisheries Science is offered by the Department of Forestry, Wildlife and Fisheries. The Master of Science in Forestry, with a concentration in forest resources management, is available for qualified students. This degree program is offered by the College of Business Administration with participation by the Department of Forestry, Wildlife and Fisheries. The Doctor of Philosophy with a specialization in forest biology, wildlife science, or fisheries science can be achieved through the University’s Department of Ecology and Evolutionary Biology.

A joint program between the department and Knoxville College leading to a specialized B.S. in Biology prepares Knoxville College graduates for graduate programs in natural resources.

THE MASTER’S PROGRAMS

Both thesis and non-thesis options are available for the major in Forestry; a thesis is required in Wildlife and Fisheries Science. For admission, the student must have a Bachelor’s degree from an accredited institution in forestry, wildlife, fisheries, or other natural resource area. Applicants must also take the Graduate Record Examination (GRE). Graduate School rating forms or letters of recommendation from three individuals familiar with the applicant’s academic ability are required. The department also has an application that must be submitted at the time of application to The Graduate School.

Thesis Option
1. Prior to research for the thesis, the student is required to develop a detailed written research proposal. Registration for 6 hours of Thesis (Forestry 500 or Wildlife and Fisheries Science 500) is required.
2. A graduate committee of no fewer than 3 faculty members must be selected by the second semester of residence. At least one member shall be from outside the department. In addition to the thesis requirement, a minimum of 24 hours of graduate coursework is required. This requirement must be completed for the student’s progress or background indicates such need.
3. All students are required to include Forestry 512 or Wildlife and Fisheries Science 512, Seminar, in their programs. This is required of each graduate student in residence fall semester.
4. An oral examination covering the thesis and coursework is required.

Non-Thesis Option (Forestry only)
1. Thirty-five hours of graduate coursework of which 23 must be at the 500 level or above is required.
2. A graduate committee of no fewer than 3 faculty members will be selected. At least one member shall be from outside the department. The committee will meet and schedule the student’s program during the first semester in residence.
3. Three hours of Forestry 511 are required.
4. Nine hours of coursework in the department must be at the 500 level or above, exclusive of Forestry 511.
5. Final comprehensive written and oral examinations shall be taken upon completion of no fewer than 28 hours of approved study.

A concentration in managing natural resource organizations is available under the non-thesis option with a major in Forestry. The minimum core requirements include: Forestry 511, 570, and six additional hours of Forestry courses to be selected in consultation with the student’s committee; Political Science 564, Management 504, and Planning 560. Fourteen hours of elective coursework are selected with the faculty advisor.

MINOR IN ENVIRONMENTAL POLICY

The department participates in a program designed to give master’s level graduate students an opportunity to develop an interdisciplinary specialization in environmental policy. See Economics for program description.

ACADEMIC COMMON MARKET

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

Forestry

GRADUATE COURSES

422 Forest and Wildland Resource Policy (3) Policy formulation; criteria for policy determination; forest and wildland law and regulations; theory of conflict resolution; formal and informal resolution. Prereq: Senior standing. F

423 Wildland Recreation Planning and Management (3) Planning processes, master and site planning, site design projects; management strategies, methods of visitor and recreation site management; case studies. Weekend field trips. Prereq: Wildland Recreation or consent of instructor. 2 hrs and 1 lab. Sp

433 Wood Adhesives and Glued Wood Products (2) Theory and practice of adhesive bonding of wood; substrate-adhesive interface for bonding; principles of adhesion; glueing of solid wood and composite wood materials; practice laboratories; manufacture and testing of adhesives; adhesive bond strength and glued-wood product performance; dry field trips. Prereq: Wood Properties and Uses and Wood Identification; or consent of instructor. 1 hr and 2 labs. F

434 Wood Processing and Machining (2) Primary market breakdown and secondary processing into major products. Fundamentals of machining technology for major types of cutting operations: sawing, boring, planing, veneer cutting, and laser machining; day field trip. Prereq: Wood Properties and Uses and Wood Identification; or consent of instructor. 1 hr and 2 labs. Sp

435 Wood Drying and Preserving (2) Discussion of wood moisture relationships. Introduction to commercial wood drying equipment and practices. Proper use, specification, and disposal of preservative treated wood. Day field trips. Prereq: Wood Properties and Uses and Wood Identification or consent of instructor. E

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

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

511 Problem Analysis in Forest Resources (3) Problem identification, analysis and solution in forest resources management. Identify, analyze and prepare written report. Topics and report must have approval of graduate committee. Available only to students in non-thesis option for M.S. in Forestry. E

512 Seminar (1) Current developments in forestry. Required of all graduate students in residence. May be repeated. Maximum 2 hrs. S/NC only. F

520 Advanced Forest Tree Biology (3) Growth, reproduction, and physiology of trees; forest ecology, variability and taxonomy of forest trees; Prereq: Graduate standing in forestry or biological science, or consent of instructor. F

530 Advanced Forest Resource Management (3) Analysis of forest management problems as exemplified in public agencies and private firms. Forest organization and computerized regulation systems; financial and operational planning tools, as applied to forest resource management. Prereq: Senior level forest management or consent of instructor. Sp

540 Genetics in Forestry (3) Genetic improvement of forest trees; selection of superior phenotypes; field testing for genetic variability; tree breeding; development of seed orchards; hybridization; tree cytology and tissue culture; use of biochemical variation; planning and conducting forest genetics research. Prereq: Silvicultural methods and Biology 220 or consent of instructor. Sp

550 Recreation Planning for Forests and Associated Lands (3) Planning process for recreation development on forests and associated lands; analysis and critique of specific contemporary alternatives. Overnight field trips. Prereq: Senior level in forest recreation or consent of instructor. F

570 Management & Policy of Forest Resource Organizations (3) Theory and application of management as applied to natural resource organizations; institutional direction and culture, and strategic management. Development of policy as planning tool and as results from conflict resolution. Linkage between policy development and execution, and structure and management of organizations. Prereq: Forest administration and policy or consent of instructor. F

580 Advanced Silviculture (3) Silvicultural characteristics, silvicultural practices and systems applied to commercially important hardwoods and softwoods. Depth analyses of silvicultural principles involved and tools used, prescribed fire, pesticides, in regeneration and management computer modeling of stand dynamics, structure, growth/yield. Prereq: Undergraduate silviculture course or consent of instructor. 2 hrs and 1 lab. Sp

585 Advanced Forest Biometry (3) Application of sampling techniques to forest inventory; fixed and variable plot sampling; list sampling; Poisson sampling; regression estimators; multistage and multiphase sampling. Growth and yield predictors for even-aged and uneven-aged forests. Prereq: Land Measurement Techniques and Forest Resource Inventory or consent of instructor. F

590 Advanced Topics in Forestry (1-3) Recent advances and concepts; research techniques and analysis of current programs. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

593 Independent Study in Forestry (1-4) May be repeated. Maximum 6 hrs. E

Forestry, Wildlife & Fisheries

GRADUATE COURSES

410 Wildlife Habitat Evaluation and Management (3) Ecological relationships between wildlife and habitat. Evaluation, modeling, and management of wildlife habitat. Effects of land-use practices on wildlife habitat. Weekend field trips. Prereq: Principles of Wildlife and Fisheries Management or consent of instructor. Applicable to majors in Forestry and Wildlife and Fisheries Science. 2 hrs and 1 lab. F

416 Planning and Management of Forest, Wildlife and Fisheries Resources (3) Integrated forest and wildlife management plans and analyzing case studies including conflict resolution. Applicable to majors in Forestry and Wildlife and Fisheries Science. Prereq: Senior standing 1 hr and 2 labs. Sp

525 Management of Forest, Wildlife and Fisheries Resources (2) Current technologies and management
Wildlife and Fisheries Science

GRADUATE COURSES

440 Wildlife Techniques (3) Methods of wildlife damage control, forest, farmland, wetland wildlife habitat management, identification of wildlife field signs, wildlife capturing techniques and management plan preparation. Weekend field trips. Prereq: Principles of Wildlife and Fisheries Management or consent of instructor. 1 hr and 1 lab or field. F

442 Fisheries Techniques (2) Active and passive sampling techniques for fish and aquatic organisms; population estimation methods; fish handling and transport; food habits analysis; marking and tagging techniques; age determination and growth analysis; stream assessment; equipment and instrumentation usage and maintenance; safety in sampling methods. Weekend field trip. Prereq: Principles of Wildlife and Fisheries Management or consent of instructor. 1 hr and 1 lab or field. F

443 Fisheries Science (3) Quantification and management of freshwater fisheries: population estimation, age and growth, biological assessment, and stocking. Prereq: Principles of Wildlife and Fisheries Management or consent of instructor. 2 hrs and 1 lab. Sp

444 Ecology and Management of Wild Mammals (3) Biological and ecological characteristics of game mammals and endangered mammals. Current principles and practices of wildlife mammal management. Prereq: Principles of Wild land and Fisheries Management or consent of instructor. 2 hrs and 1 lab. One weekend field trip required. Sp

445 Ecology and Management of Wild Birds (3) Biological and ecological characteristics of game birds, endangered birds, and bird pests. Current principles and practices of wildlife bird management. Prereq: Principles of Wildlife and Fisheries Management or consent of instructor. 2 hrs and 1 lab. Sp

490 Ethics in Wildlife and Fisheries Management (1) Ethical bases for decision-making and application of methodologies in practice of wildlife and fisheries management. Seminars by ethicists, wildlife and fisheries scientists and managers, and foresters to acquaint students with diverse perspective of ethical behavior in practices of wildlife and fisheries management. Lectures, panel discussions, and case studies. Team taught. Prereq: Senior standing. Sp

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

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


French

See Romance Languages

Geography

(College of Arts and Sciences)

MAJOR DEGREES

Geography ............................................. M.S., Ph.D.

Carol Harden, Head


Associate Professors: Brinkman, Leonard W., Jr., Ph.D. ........................................... Wisconsin Harden, Carol P., Ph.D. ........................................... Colorado Horn, Sally P., Ph.D. ........................................... California Rehder, John B., Ph.D. ........................................... Louisiana State

Assistant Professors: Orvis, Kenneth H., Ph.D. ...........................................

The department offers the Master of Science and Doctor of Philosophy degrees. The master's degree emphasizes development of professional competence as a geographer and offers opportunities to gain substantial depth in a concentration or a major technique. An emphasis in geographic information systems is available for students who have appropriate background in mathematics and computer science. The doctoral program is for those who have demonstrated proficiency in conducting independent research. The department is particularly well-qualified to direct graduate work in location analysis, transportation geography, urban and rural geography, cultural ecology, and the geography of the natural environment, especially biogeography and geomorphology. The faculty is qualified to direct students from a variety of approaches ranging from historical and humanistic to rigorously analytic and GIS-based.

THE MASTER'S PROGRAM

The department offers the thesis and non-thesis options for the Master of Science. Both options require a minimum of 30 semester hours beyond the completion of a sound undergraduate major program. At least two-thirds of the total hours in the degree program must be at or above the 500 level and include 501 (each offering during residency) and 504, and 3 semester hours at the 600 level in the thesis option, 6 hours must be Thesis 500. A final examination is required in both programs.

THE DOCTORAL PROGRAM

The doctorate is a research degree and is granted only to those who demonstrate proficiency in conducting independent research. Students must have a broad foundation and understanding of the discipline; those should have been achieved in a comprehensive master's program. Course requirements for the degree shall be determined by the student's faculty committee in accordance with specific interests and needs. The program must include 504, 515, 599, 9 hours of 600-level seminars, and (at each offering during residency) 501. A minimum of 12 hours must be earned in related fields outside the department. Competence in cartography and quantitative techniques is required. Additional tools, including languages, will be required as appropriate to the student's areas of research specialization. Examinations required for admission to candidacy include a written comprehensive; written examinations on two special fields; and an oral examination of the student's program, the special fields, and the dissertation proposal. Also required is a final oral examination on the dissertation and on other aspects of the program as determined by the student's doctoral committee.

MINOR IN ENVIRONMENTAL POLICY

The department participates in a program designed to give master's level graduate students an opportunity to develop an interdisciplinary specialization in environmental policy. See Economics for program description.

strategies concerning wise use of forestry, wildlife, and fisheries resources for decision making and implementation. Prereq: 6 hrs of biological sciences or consent of instructor. Not available to students in forestry or wildlife and fisheries science. 4 hrs and 1 lab for six weeks. Sp.

535 Environmental Impacts to Natural Ecosystems (3) Current environmental problems impacting natural ecosystems: climatic change, acid deposition, air pollution, species distribution, and introductions of exotic species. Management methodologies to mitigate environmental problems. Overnight trip. Prereq: 416 or equivalent or consent of instructor. Applicable to majors in Forestry and in Wildlife and Fisheries Science. Sp.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The Ph.D. program in Geography is available to residents of states of Alabama, Arkansas, Mississippi, Virginia, and West Virginia. The master's program is also available to residents of Texas. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

411 Computer Mapping and Geographic Information Systems (3) Concepts, management, and presentation of digital data for spatial analysis: cartographic data structures. Prereq: 310 and knowledge of computer language or consent of instructor. 2 hrs and 1-2 hr lab.

412 Cartography (3) Cartographic techniques applied to design, compilation, and reproduction of maps and other graphic materials. Prereq: 310 or consent of instructor. 2 hrs and 1-2 hr lab.

413 Remote Sensing: Types and Applications (3) Principles and uses of remote sensing imagery, digital data, and spectral data: geographic interpretation and mapping techniques. Prereq: 310 or consent of instructor.

415 Quantitative Methods in Geography (3) Geocraphic application of statistical techniques, point pattern analysis, and analysis of areal units. Prereq: Mathematics 115 or two semesters of calculus or consent of instructor.

421 Geography of Folk Societies (3) Geographical study of folk culture, traditional material culture, and rural settlement, examples from eastern North America and selected foreign areas. Prereq: 101-02 or 320 or consent of instructor.

425 Historical Geography of the United States (3) Survey of changing human geography of the United States during four centuries of settlement and development. Changing population patterns, development of agricultural regions, and growth of urban-industrial development. Prereq: 361 or consent of instructor.

433 The Land-Surface System (3) Characteristics of surface form, water, vegetation, and surface materials, and their interrelationships. People as evaluators of and agents of change. Prereq: Geography of the Natural Environment or consent of instructor.

434 Climatology (3) General circulation systems leading to world pattern of climates, climatic change and modification, and interrelationships of climate and human activity. Prereq: Geography of the Natural Environment or Meteorology or consent of instructor.

435 Biogeography (3) Classification and distribution of plants and animals on a variety of spatial and temporal scales. Effects of continental drift, Pleistocene climatic change, and human influence on world biota. Prereq: Geography of the Natural Environment or consent of instructor.

454 Water Resources (3) Global water resources and change, and human activity on world biota. Prereq: 101-02 or 141 or 340 or consent of instructor.

445 Geography of Resources (3) Study of factors related to variations in resource availability from time to time and place to place: energy and metallic resources. Prereq: 101-02 or 141 or 340 or consent of instructor.

449 Geography of Transportation (3) Examination of transportation systems, their effect on trade patterns, land use, location of problems, and development. Prereq: 141 or 340 or consent of instructor.

450 Process Geomorphology (3) Same as Geology 450.

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

501 Colloquium in Geography (1) Discussion of departmental research, current research literature, and general topics. Registration required of graduate student whenever offered. May be repeated. Maximum 4 hrs. May be applied toward graduate degree. S/NC only.

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

504 Research Design (3) Geographical research procedures and development of research design through field work and final report.

505 Directed Research (2-6) Research on problems as defined by individual students. Prereq: Written consent of instructor and department prior to registration. May be repeated with consent of instructor. Maximum 6 hrs. S/NC or letter grade.

506 Directed Readings (2-6) Readings on topics of interest as defined by individual students. Prereq: Written consent of instructor and department prior to registration. May be repeated with consent of instructor. Maximum 6 hrs. S/NC or letter grade.

509 Topics in Geography (2-3) Topics vary. Prereq: Consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs. S/NC or letter grade.

510 Topics in Cartography (2-3) Trends, concepts, problems, and methods in cartography. Prereq: 411 and 412 or consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

513 Topics in Remote Sensing (2-3) Applied research using imagery for interpretation and mapping of geographic data. Prereq: 413 or consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

515 Topics in Quantitative Geography (2-3) Multivariate analysis applied to problems in geography; research problems utilizing appropriate computer programs; use of geographic research techniques developed by other disciplines. Prereq: 415 or consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

517 Geographic Information Management and Processing (3) Concepts and methods in management of geographic information. Database design, manipulation, sampling and analysis. Prereq: Consent of instructor.

519 Graduate Practicum in Cartography/Remote Sensing (2-6) Prereq: Written consent of department before registration. May be repeated with consent of instructor. Maximum 6 hrs.

521 Topics in Cultural Geography (3) Examination of trends, problems, and methods in cultural geography. Prereq: 421 or consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

533 Topics in Physical Geography (3) Examination of problems and methods in geomorphology and land surface system or in modern climatology. Prereq: 433 or 434 and consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

535 Topics in Biogeography (3) Examination of trends, problems, and methods in biogeography. Prereq: 435 or consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

541 Topics in Urban Geography (3) Examination of research on urban systems, internal morphology, urban problems, and urban spatial behavior. Prereq: 441 or consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

549 Topics in the Geography of Transportation (3) Examination of trends, problems, and methods in transportation geography and transportation networks. Prereq: 449 or consent of instructor. May be repeated with consent of instructor. Maximum 6 hrs.

550 Regional Geomorphology (3) Same as Geology 550.

557 Biological Conservation (3) Analytical treatment of biological and ecological conservation as practiced in U.S. and abroad. Prereq: Consent of instructor.

591 Foreign Study (1-15) See College of Arts and Sciences. Prereq: Written consent of department prior to registration. S/NC or letter grade.

592 Off-Campus Study (1-15) See College of Arts and Sciences. Prereq: Written consent of department prior to registration. S/NC or letter grade.

593 Independent Study (1-15) See College of Arts and Sciences. Prereq: Written consent of department prior to registration. S/NC or letter grade.

599 Geographic Concept and Method (3) Traditional and modern geographic thought; readings on nature, scope, problems, and methods of geography. Prereq: Consent of instructor.

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

609 Seminar in Geography (2-3) Topics vary. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

633 Seminar in Physical Geography (3) Prereq: 533 or consent of instructor. May be repeated. Maximum 6 hrs.

635 Seminar in Biogeography (3) Prereq: 543 or consent of instructor. May be repeated. Maximum 6 hrs.

641 Seminar in Urban Geography (3) Prereq: 541 or consent of instructor. May be repeated. Maximum 6 hrs.

643 Seminar in Rural Geography (3) Prereq: 543 or consent of instructor. May be repeated. Maximum 6 hrs.

649 Seminar in Geography of Transportation (3) Prereq: 549 or consent of instructor. May be repeated. Maximum 6 hrs.

663 Seminar in Geography of the American South (3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

673 Seminar in Geography of Latin American (3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

677 Seminar in Biological Conservation (3) Conduct of original research. Prereq: 577 or consent of instructor. May be repeated. Maximum 6 hrs.

Geological Sciences

(College of Arts and Sciences)

MAJOR

Geology .................................................. M.S., Ph.D.

Harry Y. McSween, Head

Professors:

Broadhead, Thomas W., Ph.D. .................................. Iowa
Driese, Steven G., Ph.D. ..................................... Wisconsin
Dunne, William M., Ph.D. .................................... Bristol
Hatcher, Robert D., Jr. (Distinguished Scientist) Ph.D. .................................. Tennessee
Kopp, Otto C., Ph.D. ........................................ Columbia
Labotka, Theodore C., Ph.D. ................................ Caltech
McLaughlin, Robert E. (Emeritus) .................................. Ph.D. ........... California
McSween, Harry Y., Ph.D. ...................................... Harvard

DEGREES
Graduation requires passing a comprehensive examination, taken no later than the end of the second year, completion of all course requirements with a minimum 3.0 GPA, completion of all oral and written parts of the dissertation, and successful oral defense of the dissertation.

The comprehensive examination includes both written and oral parts in which the candidate will be tested on his/her knowledge of the area concerning the proposed dissertation and all related fields. The candidate is expected to be conversant in a wide field of geological sciences.

A minimum of 24 hours of graded coursework beyond the master's degree is required in addition to the 24 hours of Dissert. 600. The coursework includes the sum of 9 hours of 600-level geology courses, 6 hours of 500-level or higher geology courses, and 6 hours of additional graduate courses. Extra-departmental coursework is encouraged.

The student must demonstrate a reading knowledge of a foreign language in which there is a body of geologic literature, as approved by the student’s dissertation committee. The foreign language requirement may be waived for Ph.D. students whose native language is not English and who have demonstrated mastery of the English language, as determined by the student’s dissertation committee.

GRADUATE COURSES

401 Quantitative Methods in Geology (3) Application of calculus and differential equations to problems in earth sciences. Use of differential equation classification, solution methods, and numerical methods. Prereq: Completion of major core courses and consent of instructor. 3 hrs and 1 lab.

420 Paleocology (4) Principles of paleocology as applied to fossils and fossil assemblages: data collection, analysis, interpretation, and synthesis. Laboratory exercises for field and laboratory, analysis, and oral presentation. Prereq: Completion of major core courses and consent of instructor. 4 hrs and 1 lab.

421 Invertebrate Paleontology (4) Survey of invertebrate animal phyla: skeletal structure and preservation, functional morphology, ecology, and stratigraphic distribution. Prereq: Paleobiology or consent of instructor. 3 hrs and 2-4 hrs.

440 Field Geology (6) Summer field course for advanced undergraduate geology majors and first-year graduate students in geology. Explores field techniques and applications, and applications to solution of geologic problems. Prereq: Completion of major core courses and consent of instructor.

450 Process Geomorphology (3) Integrative approach to development of surface of earth based upon case histories, maps, remote sensing imagery. Prereq: 101-02. (Same as Geography 450.) 3 hrs and 1 lab.

455 Basic Environmental Geology (3) Applications of ecological sciences toward comprehension of effects of geologic processes on human environment. Prereq: 12 hrs of geology courses. 3 hrs and 1-3 lab or field period.

460 Principles of Geochemistry (3) Application of chemical principles to geologic problems. Crystal chemistry and crystal structure, distribution and behavior of elements in earth's crust. Prereq: Chemistry 100-190. 3 hrs and 1 lab.

470 Applied Geophysics (3) Basic principles of geo-physical exploration: applications to environmental problems; gravitational and electromagnetic methods. Prereq: 3 hrs of geology courses numbered above 300. Elements of Physics.

471 Fieldwork in Geophysics (2) Geophysical investigations applied to solution of problems in tectonics, hydrogeology, or environment. Prereq: 2 hrs of geology courses numbered above 300. Elements of Physics.


480 Principles of Economic Geology (3) Ore-forming processes, classification of mineral deposits, survey of different types of mineral deposits with examples, and geologic evaluation. Prereq: 310 and 330 or equivalents. Recommended prereq: 460. 3 hrs and 1-2 lab hrs.

485 Principles of Hydrogeology (3) Physical principles of flow, flow equations, geologic controls, aquifer analysis, water well design-testing, introduction to transport processes. Prereq: The Dynamic Earth, Calculus, Fundamentals of Physics or equivalent, consent of instructor. (Same as Civil Engineering 485.)

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

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or facilities. May not be used toward degree requirements. May be repeated with consent of instructor. (Same as Civil Engineering 503.)

505 Structure of the Southern and Central Appalachian (2) Structural development of Southern and Central Appalachians from extensional Late Proterozoic, early Paleozoic rift-drift-platform margin through processes related to compressional events producing acratonic elements that formed Appalachian through-out the Paleozoic. Comparisons to similar orogenic. Prereq: Structural Geology.

510 Clay Mineralogy (3) Origin, chemistry, structures, and properties of clay minerals; application of mineralogical techniques in clay mineral studies. Prereq: 310 and 566 or equivalent. 3 hrs and 1 lab.

512 Data Analysis in Geology and Environmental Science (3) Application of statistical and other quantitative techniques using computers to analyze geological data; environmental problems.

525 Biostratigraphy (3) Examination of principles of biostratigraphy and stratigraphy through selected case histories. 1 hr and 1-2 hr seminar.

530 Petrogenesis of Crystalline Rocks (4) Origin and properties of igneous and metamorphic rocks, magmatic and subvolcanic processes and physical conditions. Laboratory involves petrographic study of crystalline rocks in thin section. Prereq: 410. 3 hrs and 1 lab.

535 Ground Water Hydrology (3) (Same as Environmental Engineering 535.)

540 Seminar in Local Geology (1) Introduction to geology of Southern Appalachians. 1 hr plus fieldtrips.

545 Sandstone Petrology/Physical Sedimentology (4) Field and microscopic analysis of tenacious clastic rock types; physical processes of sedimentation, transport of sediment, and formation of sedimentary structures. Prereq: 340 or equivalents. 3 hrs and 1 lab off.

546 Carbonate Sedimentology (4) Environments of deposition of modern and ancient carbonate sediment and diagenesis of resultant rocks; field and laboratory analysis of sample material and preparation of scientific reports. 3 hrs and 1 lab.

550 Regional Geomorphology (3) Integrative approach to study of natural geomorphological environments stressing links and similarities across boundaries, unique characteristics of major divisions, provinces, oases, and districts. May be repeated with consent of instructor. Maximum 6 hrs. (Same as Geography 550.)
556 Quaternary Geology of North America (3) Interpretation of geomorphologic, stratigraphic, and sedimentologic evidence in order to reconstruct Quaternary landscapes in glaciated, periglacial, and nonglacial regions of North America; correlation of major episodes of North American glacial with paleo-geomorphic changes in Atlantic and Pacific Oceans. Prereq: 101 or consent of instructor.

557 Quaternary Paleocology (3) Perturbation, process, and pattern within Quaternary ecosystems; climatic change and vegetational responses during last 2.5 million years. Prereq: Consent of instructor.

561 Aqueous Geochemistry (4) Introduction to and applications of equilibrium thermodynamics to earth surface environments; geochemistry of natural water, weathering reactions, and environmental diageneis. Prereq: Chemistry 120-20, 3 hrs and 1 lab or seminar.

563 Stable Isotope Geochemistry (3) Theoretical aspects of isotope fractionation and applications to geologic systems. Isotope exchange, variations in natural waters, diagenetic, hydrothermal and metamorphic systems. Prereq: General Chemistry or equivalent.


568 Geochemical Analysis (3) Collection and treatment of geochemical data using electron microprobe, x-ray fluorescence, and atomic absorption spectrophotometry techniques. Prereq: 310 or consent of instructor, 2 hrs and 1 lab.

570 Advanced Structural Geology (4) Current topics in structural geology and tectonics of mountain belts: recent literature. Prereq: 370 or equivalent, or consent of instructor. 3 hrs and 1 lab or seminar.

572 Fracture Analysis (3) Field and subsurface characterization, and mechanical development of natural fractures: role in groundwater flow. Prereq: Structural Geology or equivalent, or consent of instructor.

575 Tectonics (4) Evolution of Earth's lithosphere in context of plate tectonics theory: Formation of continents through convection and paleo-anatomy of mountain belts, including Appalachian, Alps, Ural, Caledonian, Cordillera, Andes, and Himalayas. Prereq: Structural Geology or consent of instructor. 5 hrs and 1 seminar.

576 Reflection Seismology (3) Imaging subsurface features using reflected seismic waves. Energy sources, modes of wave propagation, field procedures, computer data processing, and pitfalls. Applications to tectonic and environmental problems. Prereq: 470 or consent of instructor.

585 Contaminant Hydrogeology (3) Physical transport processes, isotopes and groundwater age dating, processes influencing inorganic, organic and microbial contaminants, sampling and monitoring methods: remediation of contaminated groundwater, aquifer protection. Prereq: 485 or 535, 460 or 561; or Environmental Engineering 553 or equivalent, and consent of instructor.

586 Field and Laboratory Methods in Hydrogeology (3) Research methods. Measurement of hydraulic properties, drills, sampling and instrumentation, tracer experiments. Formulating hypotheses and research plans. Prereq or coreq: 485 or Environmental Engineering 535, and consent of instructor.

590 Special Problems in Geology (1-3) Directed study or special topics. Prereq: Consent of instructor. May be repeated. Maximum 10 hrs.

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

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

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

594 Field Problems in Geology (1-2) Literature study and seminars on specific regions of geologic interest, supplemented by extended field trip. Prereq: Consent of instructor. May be repeated. Maximum 8 hrs.

595 Selected Topics in Geology (1) Presentation of research by faculty and visiting scientists. Registration required each semester for resident full-time graduate students, except in summer and when registered for 594, S/N only.

596 Geology Colloquium (1) Preparation and oral presentation of scientific material. Grade based on consent, preparation, presentation, and instructor critique in departmental seminar. Taken only once during residence for each graduate student.

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

620 Seminar in Paleonology (3) May be repeated with consent of department. Maximum 9 hrs.

630 Seminar in Petrology (3) May be repeated with consent of department. Maximum 9 hrs.

640 Seminar in Sedimentary Geology (3) May be repeated with consent of department. Maximum 9 hrs.

650 Seminar in Geomorphology and Quaternary Geology (3) May be repeated with consent of department. Maximum 9 hrs.

660 Seminar in Geochemistry (3) May be repeated with consent of department. Maximum 9 hrs.

670 Seminar in Structural Geology (3) May be repeated with consent of department. Maximum 9 hrs.

675 Seminar in Geophysics (3) Advanced treatment of selected topics in geophysics. Prereq: 470 or consent of instructor.

680 Seminar in Economic Geology (3) May be repeated with consent of department. Maximum 9 hrs.

Germanic and Slavic Languages (College of Arts and Sciences)

MAJORS

DEGREES

German ............................................. M.A.
Modern Foreign Languages ................... Ph.D.

David E. Lee, Head

Professors:
Falen, James E., (Emeritus), Ph.D. Pennsylvania
Fiene, Donald M., (Emeritus), Ph.D. .... Indiana
Hoedjes, Carolyn R., Ph.D. ................. Chicago
Kratz, Harry (Emeritus), Ph.D. .......... Ohio State
Osborne, J.C. (Emeritus), Ph.D. .... Northwestern

Ritzenthaler, Aura C. (Emerita), Ph.D. .... Connecticut

Associate Professors:
Lauckner, Nancy A. (Lialison), Ph.D. . Wisconsin
Lee, David E., Ph.D. ......................... Stanford
Mellier, C. J., Ph.D. ......................... Chicago

Assistant Professors:
Blackwell, Stephen H., Ph.D. ............... Indiana
Hoeyng, Peter, Ph.D. ....................... Michigan
Livers, Keith A., Ph.D. ...................... Michigan
Moser, Beverly, Ph.D. ...................... Georgetown
Ohnesorg, Stefanie, Ph.D. ................... McGill
Pervukhin, Natalia K., Ph.D. ............... Bryn Mawr

The Department of Germanic and Slavic Languages offers two advanced degrees: the Master of Arts in German and the Doctor of Philosophy in Modern Foreign Languages. Inquiries should be addressed to the head of the department.

THE MASTER'S PROGRAM

The department requires a minimum of 30 semester hours including 15 hours of coursework numbered 500 and above and 6 hours of Thesis 500.

THE DOCTORAL PROGRAM

The Ph.D. in Modern Foreign Languages is offered jointly by the Department of Germanic and Slavic Languages and the Department of Romance and Asian Languages and requires advanced training in a major language and either a second language or applied linguistics. Students whose language of first concentration is French or Spanish should consult the section on Romance and Asian Languages.

Admission Requirements

Applicants must have completed a B.A. in either French, German or Spanish to be accepted into this program. Both graduates of institutions in the United States and those with undergraduate degrees from institutions outside the United States must have a grade point average of at least 3.0. Consideration will also be given to applicants who do not have an undergraduate degree in one of the three foreign languages but do have the equivalent of an undergraduate major in one of them.

Degree Requirements

Candidates with German as a first concentration must complete a minimum of 63 semester hours of coursework beyond the bachelor's degree in addition to 24 hours of doctoral research and dissertation. The coursework must be distributed as follows:

1. First Concentration: German. A minimum of 39 hours of German courses beyond the bachelor's degree, distributed as follows:
   400 level: A maximum of 6 hours of 400-level classes taken for the M.A. may be applied.
   500 level: A minimum of 21 hours must be taken. These must include German 512, 519, 520, and 560. Thesis hours are excluded. If 512 is used as part of a second concentration in applied linguistics, another course must be substituted in the first concentration.
   600 level: A minimum of 12 hours must be taken, exclusive of dissertation hours.

2. Second Concentration. A minimum of 18 hours beyond the bachelor's degree, taken in the field of applied linguistics or in a second language, either French, Italian, Russian or Spanish. Twelve of these hours must be at the 500 level or above.

Students choosing applied linguistics must take German 425, 435, 510, or 512, 3 hours of German linguistics, such as 426, 436, 631, or 632, and 6 hours of linguistics electives in English or German. The student's graduate advisor must approve the electives chosen.

3. Cognitive Field. Six hours in graduate courses numbered 400 and above in a field outside the department of the first concentration but related to the student's principal area of research. Students choosing applied linguistics as a second concentration are strongly urged to take their cognate work in a second language.

4. Additional requirements: For any languages taken as a first or second concentration, a student must demonstrate competence by taking a test. The test will include reading, writing, listening, and speaking, and should be completed by the time the student reaches 4
Health, Leisure, and Safety Sciences
(College of Human Ecology)

MAJORS

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<tr>
<th>Human Ecology</th>
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<td>Health Education</td>
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<td>Recreation and Leisure Studies</td>
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<td>Safety Education and Service</td>
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Charles B. Hamilton, Head

Professors:

Gorski, June, Dr.P.H............UCLA
Hamiton, Charles B. (Liaison),
Dr.P.H...........................Oklahoma
Hayes, Gene A. (Liaison),
Ph.D............................North Texas State
Kirk, Robert H., H.S.D.......Indiana
Wallace, Bill C. (Liaison),
Ed.D..........................Northern Colorado

Associate Professors:

Blanton, Mary Dale, Re.D.......Indiana
Krick, Ken L., Re.D.............Indiana
Pursley, R. Jack, Ph.D.........Iowa

Prof. Charles B. Hamilton, Head

The Health, Leisure, and Safety Sciences Department offers graduate programs leading to the Master of Science with majors in Health Promotion and Health Education, Recreation and Leisure Studies, and Safety Education and Service, and to the Master of Public Health degree in Public Health. The department provides doctoral preparation in Health Education (Ed.D., and Ph.D. through a concentration in Human Ecology), Inquiries should be directed to the department head.

Application packets are available by request to the department.

The department fosters a natural uniting of disciplines that contribute to a holistic approach to healthy living and the enjoyment of life for all citizens. The academic disciplines focus on assisting students, clients, and faculty to (1) develop a healthful and safe lifestyle that considers the dimensions of disease and injury prevention, and the role of leisure as it contributes to mental, social, and physical health; and (2) prepare persons for competent practice of their respective disciplines, including scholarly, creative, and management endeavors. The department is committed to the educational value of community-based experiential learning.

Health

Graduate programs are available leading to the Master of Science with a major in Health Promotion and Health Education (thesis and non-thesis options) and to the Doctor of Education with a major in Health Education.

The Master of Science, with thesis and non-thesis options, requires completion of 30 semester hours.

The Doctor of Philosophy with a major in Human Ecology offers a concentration in community health.

THE PH.D. CONCENTRATION

The community health concentration integrates the behavioral and natural sciences with public health, community health education, health promotion and the safety sciences to prepare scholars with an interest in improving the health of the nation.

Requirements include:
1. Minimum 24 hours of foundational courses: 610, 620, 6 hours of statistics, 3 hours of specialized research methods, 6 hours of natural or behavioral sciences, and Human Ecology 610.
3. Minimum 12 hours in support specialization in a focused area: public health, safety, gerontology, or a program approved by doctoral committee.
4. Minimum 6 hours in a cognate area.

ACADEMIC COMMON MARKET

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

GRADUATE COURSES

400 Consumer Health (3) Survey of major consumer health care providers and health care services; selecting, purchasing, evaluating and financing medical and health care services/products. (Same as Public Health 400.) Sp
405 Alcoholism and Alcohol Education (3) Problems of alcoholism. Factors which make alcoholism serious health and safety problem. Various types of instructional/educational and intervention programs. F
406 Death, Dying and Bereavement (3) Aspects of dying, death and handling trauma of loss. Medical, financial, physical, legal and social implications of death. F, Sp
420 Sex Education As It Relates to Human Sexuality (3) Exploration of sexual aspects of human sexuality. Issues, trends, and content of sex education. E
425 Women's Health (3) Factors influencing women's health and women consumers in nation's health service delivery systems. Health problems/concerns of women and techniques for prevention, maintenance and/or correction. (Same as Women's Studies 425.) E
430 Suicide and Crisis Intervention (3) Factors which make suicide serious health problem. Assessment, intervention, and prevention techniques. Sp
435 Substance Use and Abuse (3) Drug and alcohol abuse problems and suspected causes; pharmacology of drugs and effects on society; strategies for intervention and education. Sp
450 Aging and Health (3) Aging process in health perspective as related to health promotion and wellness of aged. F, Sp
450 Thesis (1-15) P/NP only. E

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered in a semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N only. E
520 Sex Education and Human Sexuality (3) Advanced in-depth discussion of educational and health counseling theory, techniques, materials used in school, community, or health care facility. Sp
530 Health Promotion and Health Education Program Development (3) Theories and principles of health promotion program development; methodology, marketing, public relations. Health education as a vehicle for health promotion. Sp
540 Evaluation in Health Promotion and Health Education (3) Evaluation principles and methodologies as related to health promotion products, processes and programs. Construction of instruments for use in assessing health education outcomes. Sp
570 Special Topics (1-3) For graduate students, in-service teachers and other health professionals. Health/wellness or health promotion issues. May be repeated. Maximum 12 hrs.
590 Research Methods in Health (3) Basic research methods in a variety of health settings. Development of research skills and problem identification for research topic. (Same as Public Health 590.) F
593 Directed Independent Studies (1-3) Individual identification and study of health/wellness or health promotion problems. Specific proposal to instructor before registration. May be repeated. Maximum 12 hrs. E
600 Doctoral Research and Dissertation (3-15) P/NP only. E
601 Internship/Research in Safety and Health (3-6) (Same as Safety 601.)
610 Critical Analysis of Writing and Research (3) Analysis of writing and research in health related areas. F
620 Advanced Research Techniques in Health (3) Advanced theory and techniques of research design and methodologies in health discipline. Prereq: 590, 610. Sp
650 Health Aspects of Gerontology (3) Knowledge and understanding of biological, psychological and sociological aspects of aging as related to health and wellness of individuals. (Same as Public Health 650.) Su
655 Seminar in Nation's Health (3) Comprehensive study of definitions, determinants, resources and health status of nation. (Same as Public Health 655.) F
660 International Health (3) Study of quality of health, health promotion and health services in countries throughout the world. (Same as Public Health 660.) Sp

Public Health

Graduate study with a major in Public Health leads to the Master of Public Health (M.P.H.). Two professional preparation concentrations are available: community health education and health planning/administration. The M.P.H. program is accredited by the Council on Education for Public Health. A minor in statistics is available to interested M.P.H. students due to public health affiliation with the Intercollegiate Graduate Statistics Programs.

ADMISSION REQUIREMENTS

A statement of the applicant's educational and career goals and three rating forms are required. Request application packet from the department. Preferential consideration for
admission to degree status shall be given to those with a minimum undergraduate gpa- 
point average of 2.0 and with at least one year of professional experience in a health-related 
occupation. as a restricted program, non-degree admission requires department recommenda-
dealines. deadlines for completed applications are 1 


THE MASTER'S PROGRAM
The M.P.H. is a non-thesis program requiring 
completing 38 semester hours of coursework 
including 10 weeks of field practice. field practice 
provides a full-time experience with an affiliated 
health agency or organization offering one or 
more health programs. of importance, field 
practice allows the student to apply academic 
concepts, methods and skills in actual work 
settings. students must complete all assigned 
prerequisite courses and 21 semester hours of the 
curriculum with a minimum overall GPA of 
3.0 prior to placement in the field.

As an alternative to field practice, preparation 
of a master's essay may be used to fulfill 
the professional skills development component 
of the curriculum and may also be received from 
the Public health academic program 


MINOR IN GERONTOLOGY
Graduate students in Public health may 
pursue a specialized minor in gerontology. This 
interdisciplinary minor gives the student an opportunity for combining the knowledge 
about aging in American society with his/her major concentration. Please refer to 
Human Ecology for specific requirements.

ACADEMIC COMMON MARKET
An agreement among southern states for 
sharing graduate programs allows legal 
residents of some states to enroll in certain 
programs at UT Knoxville on an in-state tuition 
basis. The M.P.H. program in Public health is 
available to residents of the states of Arkansas, 
Kentucky, or Louisiana. Additional information 
may be obtained from the Admissions Specialist 
in the Office of Graduate Admissions and 
Records.

COURSE REGISTRATION
Non-degree students must obtain permission from 
the department head to register for 500-
level public health courses. Prerequisite 
coursework assigned as a condition of 
admission to the M.P.H. program must be 
completed prior to, or within the first 
term of enrollment in graduate studies.

GRADUATE COURSES

400 Consumer Health (3) 

410 Health in the Work Environment (3) 

411 Health in the Workplace (3) 

501 Fundamentals of Industrial Hygiene (3) 

502 Industrial Hygiene Controls (4) 

503 Financial Management of Health Programs (3) 

504 Principles of Epidemiology (3)

510 Environmental and Occupational Health (2) 

511 Fundamentals of Industrial Hygiene (3) 

512 Industrial Hygiene Controls (4) 

513 Industrial Hygiene Instrumentation and Sampling (3) 

514 Industrial Toxicology and Occupational Exposures (3) 

515 Organization Theory and Health Care Delivery (3) 

520 Public Health Policy and Administration (3) 

523 Management in Extended Care Settings (3) 

525 Financial Management of Health Programs (3) 

526 and 527 (3) 

530 Biostatistics (3) 

531 Organization Theory and Health Care Delivery (3) 

532 Management in Extended Care Settings (3) 

533 Financial Management of Health Programs (3) 

534 Principles of Epidemiology (3) 

535 Advanced Epidemiologic Methods (3) 

540 Principles of Epidemiology (3) 

545 Health and Society (3) 

550 Principles and Practices of Community Health Education (3) 

552 Community Health Problem Solving (4) 

558 Physical Activity and Positive Health (3) 

559 Fitness Testing, Programming, and Leadership for Diverse Populations (2) 

560 Theories and Techniques in Health Planning (4) 

561 Principles and Practices of Community Health Education (3) 

562 Theories and Techniques in Health Planning (4) 

563 Seminar in Gerontology (1) 

564 Seminar in Gerontology (1) 

565 Seminar in Gerontology (1) 

566 Principles of Epidemiology (3) 

567-88 Internship (3,3,3) 

568 Physical Activity and Positive Health (3) 

569 Fitness Testing, Programming, and Leadership for Diverse Populations (2) 

570 Organization Theory and Health Care Delivery (3) 

571 Organization Theory and Health Care Delivery (3) 

572 Organization Theory and Health Care Delivery (3) 

573 Management in Extended Care Settings (3) 

574 Management in Extended Care Settings (3) 

575 Financial Management of Health Programs (3) 

576 Financial Management of Health Programs (3) 

577 Financial Management of Health Programs (3) 

578 Health Aspects of Gerontology (3) 

579 Seminar in Nation's Health (3) 

580 Special Topics (3) 

581 Theories and Techniques in Health Planning (4) 

582 Theories and Techniques in Health Planning (4) 

583 Seminar in Gerontology (1) 

584 Seminar in Gerontology (1) 

585 Seminar in Gerontology (1) 

586 Seminar in Gerontology (1) 

587-88-89 Internship (3,3,3) 

588 Internship (3,3,3) 

589 Internship (3,3,3) 

590 Research Methods in Health (3) 

591 Directed Independent Study (1-3) 

592 Directed Independent Study (1-3) 

593 Directed Independent Study (1-3) 

594 Directed Independent Study (1-3) 

595 Directed Independent Study (1-3) 

596 Directed Independent Study (1-3) 

597 Internship (3,3,3) 

598 Internship (3,3,3) 

599 Internship (3,3,3) 

600 International Health (3) 

Recreation and Leisure Studies
Graduate study with a major in recreation 
and leisure studies leads to the Master of 
Science. Professional preparation concepts 
are available in therapeutic recreation and 
recreation administration. In the recreation 

601 Introduction to Recreation and Leisure Studies (3) 

602 Introduction to Recreation and Leisure Studies (3) 

603 Introduction to Recreation and Leisure Studies (3) 

604 Introduction to Recreation and Leisure Studies (3) 

605 Introduction to Recreation and Leisure Studies (3) 

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611 Introduction to Recreation and Leisure Studies (3)
administration, concentration, the student may emphasize professional preparation for such areas as public parks and recreation, private and commercial recreation, sports management and entrepreneurial recreation.

The M.S. with thesis option requires a minimum of 33 hours. The M.S. with non-thesis option requires a minimum of 36 hours.

**GRADUATE COURSES**

410 Maintenance and Management of Recreation and Sports Related Facilities (3) Principles for operation and management of facilities and facilities management strategies. Cost tracking, inventory systems, specialized maintenance techniques, safety guidelines, maintenance management systems and security. Prereq: 110, 310 or consent of instructor. F

415 Managing Leisure/Sport and Related Facilities (3) Principles of planning, designing, outfitting and operating leisure/sport related facilities such as aquatic centers, tennis complexes, activity centers. Prereq: Leisure Program Development and Evaluation, or consent of instructor. (Same as Sport Management 415.) F

430 Organization and Administration of Leisure Services (3) Principles of administration applied to provision of leisure services offered by public, private and commercial enterprises. Organizational structures, personnel management, evaluation, legal authority, introduction to budgeting and fiscal procedures. Prereq: 310 or consent of instructor. F

440 Dimensions of Private and Commercial Recreation Businesses (3) Nature and function of recreation in private, commercial, and industrial settings. Survey of development and management of commercial goods and services offered in leisure market. Factors influencing participation, management considerations, and research in commercial recreation and tourism. Prereq: 110, junior standing, or consent of instructor. F

450 Specialized Study in Leisure Education (1-6) Special interest leisure activities; developing positive attitudes toward leisure. Demonstrates how leisure contributes to one's mental and physical health. May be repeated. Maximum 6 hrs. E

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

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

510 Perspectives and Trends in Leisure Services (3) Basic role of leisure delivery systems in today's society, scope of leisure services, determinants of leisure behavior, developmental features of leisure and recreation. Current trends and future implications, and issues affected by and/or affecting delivery of leisure services. Sp

515 Philosophical and Conceptual Foundations of Leisure (3) Philosophy of leisure and recreation; nature of philosophy, concepts of leisure, play, work, and other factors, history of field, and relationship of ideas to contemporary society and to professional practice.

520 Program Design and Evaluation in Therapeutic Recreation (3) History, philosophy, purpose, special population served, programming process, professional aspects of therapeutic recreation. Basic overview of aspects of leisure delivery systems. Prereq: Consent of instructor. F

521 Facilitation Techniques in Therapeutic Recreation (3) Role of therapeutic recreation in clinical and non-clinical settings; application of life-style planning, self-awareness, values clarification and group process to the practice of therapeutic recreation. Prereq: 320. Su

522 Clinical Aspects in Therapeutic Recreation (3) Concepts and techniques utilized by experienced and advanced graduate students to develop specialized clinical cases, comprehensive program concerns, administrative funding and trends in practice of therapeutic recreation services. Prereq: 520. Sp

540 Fiscal Policies for Recreation and Sports Related Organizations and Facilities (3) Application of fiscal policies and procedures to operation of recreation and sports related organizations and facilities. Finance, revenue generating strategies, cash and inventory control, commercial enterprises, partnerships, and microcomputer applications. Prereq: 450 or consent of instructor. Sp

541 Management and Operation of Recreation and Sports Related Facilities (3) Research for making program and management decisions, process of cost analysis, and basic design and maintenance of recreation and sport related facilities. Prereq: Consent of instructor. (Same as Sport Management 541.) Sp

550 Internship in Recreation and Leisure Studies (3-6) Required of all graduate students. Minimum 50 clock hrs for each credit. Work experience, evaluation by agency and university and written paper. E

591 Directed Study in Leisure & Recreation (1-6) Detailed study of theme, issue, or concern. Designed to meet needs of individual students. May be repeated. Maximum 6 hrs. E

592 Special Topics in Recreation & Leisure Studies (1-6) May be repeated. Maximum 6 hrs. E

**Safety**

Graduate study with a major in Safety Education and Service (thesis and non-thesis options) leads to the Master of Science degree. The M.S. requires completion of 30 semester hours. Curricular experiences will assist graduate in preparation for certified safety professional examination.

**ACADEMIC COMMON MARKET**

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The M.S. program in Safety Education and Service is available to residents of the states of Alabama, Arkansas, or Florida. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

**GRADUATE COURSES**

441 Driver and Traffic Safety Education (4) Preparation of traffic safety instructors for schools, colleges, industries, and commercial and community organizations. Students will be taught to teach at least two non-drivers to drive. Valid driver’s license required. 3 hrs and 2 labs. Sp

442 Advanced Driver & Traffic Safety Education (3) Development of competence in teaching of driver education through use of simulation, multimedia, and multiple-car driving range. Teaching skills and supervision. 2 hrs and 2 labs.

443 Sports & Recreational Safety (3) Accident prevention and injury control in sports activities; philosophy of sports safety; human environmental factors and interaction in sports; decision making related to sports; risk-taking and decision solution strategies; and contributions of sports medicine to safety. 3 hrs and 2 labs. Sp

452 General Safety (3) Principles, practices, and procedures in general safety. Safety problems in industry, recreation, and other public areas. F, Su

453 Problems and Research in Accident Prevention (6) Safety problems in wide variety of accidents that occur in community; findings of current research in behavioral sciences as related to accident victimology. F

534 Organization, Administration and Supervision of Safety Programs (3) National, state and local level programs; administrative, instructional, and supervisory aspects. Implementation of relevant programs. Sp

535 Emergency Management (3) Civil and defense programs; emergency planning; management strategies. Cost tracking, inventory systems, specialized maintenance techniques, safety guidelines, maintenance management systems and security. Prereq: 110, 310 or consent of instructor. F

556 Directed Independent Study (1-3) May be repeated. Maximum 12 hrs.

601 Internship in Safety and Health (3-6) Field experience. Significant problem identified, researched, and reported in acceptable form. May be repeated. Maximum 6 hrs. (Same as Health 601.) E

**History**

(College of Arts and Sciences)

**MAJOR**

History.............................................M.A., Ph.D.

Rusell Buhite, Head

Professors: Bergeron, Paul H., Ph.D. .............................................Vanderbilt

Buhite, Russell D., Ph.D.............................................Michigan State

Chmielewski, Edward V., Ph.D. .............................................Harvard

Cobb, James C. (Bernadette E. Schmitt Chair of Excellence), Ph.D. .............................................Georgia

Cutler, Everett W., Ph.D. .............................................Texas

Farris, W. Wayne, Ph.D. .............................................Harvard

Finger, John R., Ph.D. .............................................Washington

Haas, Arthur G., Ph.D. .............................................Chicago

Hao, Yen-Ying, Ph.D. .............................................Harvard

Haskins, Ralph W. (Emeritus), Ph.D. .............................................California

Jackson, Charles O., Ph.D. .............................................Emory

Klein, Milton M. (Emeritus) (Distinguished Prof.), Ph.D. .............................................Columbia

Mosor, Harold, Ph.D. .............................................Wisconsin

Ratner, Lorman A., Ph.D. .............................................Cornell

Utyle, Jonathan G. (Emeritus) .............................................Illinois

Wheeler, W. Bruce, Ph.D. .............................................Virginia

 Associate Professors: Becker, Susan D., Ph.D. .............................................Case Western

Bing, John Daniel, Ph.D. .............................................Indiana

Bohstad, John, Ph.D.............................................Harvard

Brummett, Palma R. (Liaison), Ph.D. .............................................Chicago

Dacon, Todd A., Ph.D. .............................................Wisconsin

Fleming, Cynthia G., Ph.D. .............................................Duke

Johnson, Charles W., Ph.D. .............................................Michigan

Muldowny, John, Ph.D. .............................................Yale

Pinkney, Paul J., Ph.D. .............................................Vanderbilt

106 History
Assistant Professors:
Ash, Stephen V., Ph.D. ............... Tennessee
Bast, Robert J., Ph.D. .................... Arizona
Bradley, Owen P., Ph.D. ..................... Cornell
Borman, Thomas E., Ph.D. .................. Toronto
Haikey, Elizabeth, Ph.D. ............... California (Berkeley)
Higgs, Catherine A., Ph.D. ............... Yale
Lublevius, Vejas G., Ph.D. ............... Pennsylvania

The Department of History offers graduate study leading to the Master of Arts and Doctor of Philosophy degrees. The M.A. program includes a thesis or non-thesis option. The doctoral program has concentrations in American and European history with special focuses in the areas identified under group II doctoral fields. Detailed information may be obtained from the Director of Graduate Studies in History who also advises all incoming students.

THE MASTER’S PROGRAM

Admission Requirements
1. Successful completion of a baccalaureate degree from an accredited institution, preferably with a major in history.
2. Acceptable scores on the Graduate Record Examination (general and subject).

General Requirements
Complete 510 and a 600-level research seminar normally during the fall and spring semesters of the first year in the graduate program. Complete 521 in preparation for the M.A. examination. As many as 9 related hours may be taken outside the department. As many as 9 graduate credits taken elsewhere may be applied toward the M.A. degree. Except by prior approval of the Director of Graduate Studies, a student’s coursework must be at the 500 level or above.

Thesis Option
Twenty-four hours of coursework and 6 hours of Thesis 500 for a total of 30 hours are required. Thesis students are required to select one M.A. field and write a thesis. At the end of the program the thesis student will stand for a two-hour oral examination on both the thesis and the field.

Non-Thesis Option
A total of 30 hours of coursework is required. At least 6 hours must be completed in each of two M.A. fields. The primary field is examined by a two-hour written examination following the 15th semester following the term in which the student has completed the residence, coursework, and language requirements. A student stands examination in one field selected from Group I and one field selected from Group II below. Both parts are 4 hours, written, and taken during the same semester. A general oral exam will be taken following the successful completion of the two written portions. The two written and one oral exams are separate examinations, and Group I must be passed before taking Group II, and the latter passed prior to taking the oral portion. A student who fails any one of the three parts of the comprehensive examination will not be dropped from the program.

Residence and Coursework
Before being admitted to doctoral candidacy, a student must:
1. Complete History 510 at UT Knoxville.
2. Complete a minimum 6 related hours outside the department.
3. Spend 2 consecutive semesters in residence.
4. Complete 6 hours in each of two Group I doctoral fields. (Courses in the non-examined field must be graded A-F. There is no minimum hours requirement for a non-examined field. Courses taken to fulfill M.A. requirements may be counted toward this requirement.)
5. Fulfill the foreign language requirement.
6. Complete two 600-level research seminars. (One must be completed at UT Knoxville.) Students who have completed a master’s thesis need complete only one research seminar (must be taken at UT Knoxville), and History 621.
7. Maintain a 3.0 overall grade-point average in graduate work attempted.
8. Complete 21 hours of graduate coursework graded A-F at UT Knoxville beyond that required for the M.A.
9. Except by prior approval of the Director of Graduate Studies, a student’s coursework must be at the 500 level or above.

Language Requirements
Students must demonstrate competence in one foreign language through coursework or examination. The student’s doctoral committee may specify any other languages or research tools, such as statistics, essential for the student’s specialization. The foreign language requirement must be fulfilled before taking the comprehensive examination.

Comprehensive Examination
The comprehensive examination is to be taken no later than the semester following the term in which the student has completed the residence, coursework, and language requirements. A student stands examination in one field selected from Group I and one field selected from Group II below. Both parts are 4-hour written, and taken during the same semester. A general oral exam will be taken following the successful completion of the two written portions. The two written and one oral exams are separate examinations, and Group I must be passed before taking Group II, and the latter passed prior to taking the oral portion. A student who fails any one of the three parts of the comprehensive examination will not be dropped from the program.

Doctoral Fields
Group I:
1. Premodern Europe
2. Modern Europe
3. United States (colonial to present)
4. East Asia
5. World History

Dissertation and Defense
Original research forms the basis for the dissertation. Doctoral candidates must register for a minimum of 600 Dissertation Research each semester and must complete 24 hours of dissertation credit. A final oral defense is given on the dissertation in a historical context. The program must be completed within eight years from admission as a potential candidate.

GRADUATE COURSES

415 Western Economic Thought
Since the 18th Century (3) Methods of study of doctrinal history. Origins and evolution of major doctrines: classical and neo-classical economics, economics of Keynes and his followers, principal developments of second half of 20th century. Major writing requirement. May not be used toward graduate degree in History. Prereq: Introductory Economics or consent of instructor, (Same as Economics 415.)
500 Thesis (1-15) F,P,N only. E.
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N only. E.
510 Foundations of Graduate Study in History (3) Assumptions and methods of historians. Required of all candidates for advanced degrees. F.
521 M.A. Readings (3) Directed readings in preparation for M.A. examinations. Open only to master’s candidates in history. May be repeated. Maximum 6 hrs. S/N only. E.
532 Topics in Modern European History (3) Reading seminar: secondary sources on movements and trends that are multinational in focus. Focus varies. May be repeated. Maximum 15 hrs.
533 Topics in European National History (3) Reading seminar: secondary sources on intra-national topics, usually British, Russian, German or French. Focus varies. May be repeated. Maximum 15 hrs.
541 Topics in Early American History (3) Reading seminar: secondary sources on early North American
Holistic Teaching/Learning

(Course of Education)

MAJORS

Curriculum and Instruction .......... M.S., Ed.S., Ed.D.
Education .......... Ph.D.
Special Education .......... M.S.

L. Knight, Leader

Professors:
Hargis, Charles H. (Liaison), Ed.D. .......... Colorado State
Hipple, Theodore W., Ph.D. .......... Illinois
Huff, P., Ph.D. .......... Ohio State
Jost, Karl J., Ed.D. .......... Oklahoma
Knight, Les L., Ph.D. .......... Texas
Rowell, C., Glennon, Ed.D. .......... George Peabody
Scheindler, W., Jean, Ph.D. .......... Kent State
Turner, T., Ed.D. .......... Penn State

Associate Professors:
Chance, Charles A., Ph.D. .......... Ohio State
Hannum, Michael C. .......... Northern Colorado

Assistant Professors:

Instructor:
Butlerworth, Jennifer R., Ph.D. .......... Vanderbilt

The Holistic Teaching/Learning unit offers graduate programs leading to the Master of Science degree with a major in Curriculum and Instruction, concentrations in elementary education, reading education, social science education, elementary teaching and in secondary teaching, and with specialization in Special Education, concentration in general special education: the Specialist in Education and the Doctor of Education with a major in Curriculum and Instruction; and the Doctor of Philosophy with a major in Education. The unit also houses programs for students in special education, licensure in early childhood, primary, and middle school levels (grades K-6 and 1-8), reading endorsement, special education licensure, and secondary social studies. See Education Under Fields of Instruction for full description of all degree requirements.

topic's central emphasis is on holistic, integrative, and interdisciplinary teaching/learning as opposed to teaching disciplinary

subject content (e.g., science, mathematics, language arts) as separate entities. The focus on integration is more in line with how children learn and how language is central to the teaching/learning process. The role of the teacher in holistic teaching and learning becomes more of a facilitator of learning as opposed to a traditional role of teacher as the dispenser of content in the classroom. Central to the philosophy of holistic teaching and learning is knowing each individual child's learning style, abilities, and interests.

For further information, write the Holistic Teaching/Learning unit.

GRADUATE COURSES

419 Psychology and Education of Students with Mild Disabilities (6) Nature and characteristics of persons with mild handicaps and educational strategies appropriate for these persons. Prereq: Special Education Principles, Special Education Strategies, and Admission to Teacher Education Program. Coreq: 420. F

420 Field Experience in Modified Programs (3) Practicum in teaching in modified programs: planning, developing, implementing and evaluating instruction. Prereq: Special Education Principles and Special Education Strategies, Admission to Teacher Education and Curriculum and Instruction 422. Coreq: 420. S/N only. F

421 Elementary and Middle School Science and Social Studies Instruction (3) Methods and materials for teaching science and social studies. Development of functional relationships and entities of two fields. Not open to students with recent course or background in teaching science and/or social studies. Prereq: Admission to teacher education. F, Sp

422 Elementary and Middle School Teaching Methodologies (6) Methods and materials (knowledge base) for teaching reading, language arts, mathematics, science and social studies, content and curriculum overview, Unit planning, planning, planning, evaluation, etc., and language and concept development.

429 Language Arts/Reading Instruction in Elementary and Middle School (3) Language and language development as applied to teaching of oracy (listening, speaking) and aspects of literacy (reading process/reading and writing). Not open to students with recent course in language arts methods. Prereq: Admission to teacher education. F, Sp

430 Elementary and Middle School Developmental Reading Instruction (3) Word recognition (including phonics), comprehension, evaluation, and materials. Not open to students with recent course in reading methods. Prereq: Admission to teacher education. F, Sp

431 Field Experience in Comprehensive Programs (3) Prereq: Special Education Principles and Special Education Strategies, Admission to Teacher Education and Curriculum and Instruction 422. Coreq: 430. S/N only.

432 Psychology and Education of Students with Moderate/Severe Disabilities (6) Nature and characteristics of persons with moderate/severe disabilities and educational strategies appropriate for these persons. Prereq: Special Education Principles and Special Education Strategies, Admission to Teacher Education and Curriculum and Instruction 422.

434 Topics in Reading Education (1-6) Prereq: Admission to teacher education and course in reading education. May be repeated. Maximum 6 hrs. E

434 Teaching Strategies and Issues in Social Studies Education (3) Goals, objectives, teaching techniques, materials, and evaluation; directed observation in public schools, preparation of teaching plans and materials; simulation teaching experiences. Prereq: Admission to Teacher Education Program.

436 Speech and Language Basis of Learning Disabilities in the Classroom (3) Normal communication development; understanding of speech and language implications in school-age student integration of oral written communication skills into existing curriculum, especially for high incidence special education students.
537 Diagnosis and Correction of Classroom Reading Problems (3) Procedures, methodologies and materials for diagnosing and correcting classroom reading problems. Prereq: Course in teaching reading, equivalent teaching experience, or consent of instructor. Sp, Su

538 Practicum in Diagnosis of Reading Problems (3) Theoretical and practical applications of specific reading diagnostic instruments, testing of elementary and secondary school students, preparing case study reports, and conducting parent conferences. Prereq: Course in diagnosis and correction of classroom reading problems or consent of instructor. Sp, Su

539 Practicum in Remediation of Reading Problems (3) Application of learning and teaching methodology in working with elementary and/or secondary school students on one-to-one or small group basis. Prereq: Course in diagnosis and correction of reading problems or consent of instructor. Sp

550 Assessment and Correction of Language Arts Difficulties (3) Procedures and materials for diagnosing and correcting language arts difficulties; analysis of children's work. Prereq: At least one language arts course or consent of instructor. Su

553 Assessment of Exceptional Students (3) Current issues related to assessment; advanced study of evaluation models for special education; critical evaluation of various assessment approaches; application of current models to special education programs. Prereq: Consent of instructor. Su

555 Characteristics of Affective/Motivational Functioning in Children with Disabilities (3) Definition, methods, identification and symptoms of children with affective/motivational disability; characteristics of children labeled behaviorally disordered. Prereq: Consent of instructor. Su

556 Instructional Systems for Affective/Motivational Education for Children with Disabilities (3) Educational strategies and models of instruction; simulation, demonstration, and media. Teaching techniques, materials, and teacher/pupil/family interactions. Therapeutic forms of educational therapy. Prereq: Consent of instructor. Sp

557 Special Topics (1-3) Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

558 Teaching Secondary School Social Studies (3) Analysis of new and innovative social studies programs and teaching methods. Prereq: Consent of instructor. Sp

566 Seminar in Research Techniques in Special Education (3) Evaluation of appropriate research methodologies with handicapped populations. Prereq: Consent of instructor. Sp

579 Teaching Secondary School Social Studies (3) Strategies, projects, materials, and programs in social studies. Prereq: Undergraduate course in teaching of social studies. F, Su

586 Seminar in Research Techniques in Special Education (3) Seminar in research techniques in special education. Prereq: Consent of instructor. F, Su

590 Application of Microcomputer Technology in Special Education and Educational Rehabilitation (3) Application in the classroom of microcomputer technology with the study of educational environments and teaching methods. Prereq: Consent of instructor. F, Su

591 Clinical Studies (4) Relationship between educational theory and application during internship; research project, development of portfolio, and capstone experience. Prereq: Consent of instructor. F, Su

599 Seminar in Social Studies Education (3) Research, trends, and issues in secondary social studies. Su

600 Doctoral Research and Dissertation (3-15) Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

603 Advanced Studies and Theoretical Models of Reading (3) Research on reading processes. Current theoretical models related to how humans process print. Prereq: 500-level course in reading education or consent of instructor. Sp

604 Seminar in Curriculum and Instruction (1) Requisite 2 consecutive semesters. S/NC only.

606 Research in Elementary Education (3) Analysis of research in elementary education with application to classroom teaching. Prereq: Research course. Sp

510 Internship in College Teaching and Supervision (3) Practicum in teaching and supervision in college classrooms. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.


620 Internship in Research in Special Education and Rehabilitation (3-9) Placement with professional agencies engaged in the research theoretically based: public school, institutions, agencies or university settings. Prereq: 9 hrs in statistical and research methods. May be repeated. Maximum 9 hrs. S/NC only.

621 Seminar in Social Studies Research and Theory (3) Status of research and research-related research, research applied to teaching, and application of research. Prereq: Recent course in teaching of social studies or consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

630 Internship in Institutional Leadership in Special Education and Rehabilitation (3-9) Advanced level field experience with professional experience engaged in the educational process. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

651 Advanced Studies in Elementary Language Arts (3) Selected issues in elementary language arts. Prereq: Graduate course in elementary language arts or consent of instructor. Sp

679 Special Topics (1-3) Prereq: Admission to doctoral program. May be repeated. Maximum 9 hrs. S/NC or letter grade.

689 Internship (1-3) Experience in application of principles and practices of classroom instruction and educational improvement. Prereq: Program prerquisites and consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

693 Independent Study (1-3) May be repeated. S/NC or letter grade.

694 Supervised Reading (1-3) May be repeated. S/NC or letter grade.

695 Special Topics (1-3) May be repeated. S/NC or letter grade.

Home Economics Education

See Human Ecology
Human Ecology

(College of Human Ecology)

MAJOR DEGREE
Human Ecology................................. M.S., Ph.D.

The College of Human Ecology offers the Master of Science and Doctor of Philosophy degrees with a major in Human Ecology.

ADMISSION REQUIREMENTS

A completed file for review includes the Graduate School application file, College of Human Ecology application, Graduate Record Examination (GRE) scores for the general section (for the M.S. program in Human Ecology, the Miller's Analog Test (MAT) score is acceptable), and three Graduate School Rating Forms completed by individuals who can attest to the potential for graduate education. Forms may be obtained from the Dean's Office, College of Human Ecology.

THE MASTER'S PROGRAM

The Master of Science with a major in Human Ecology is a college-wide, multidisciplinary program. This degree provides a flexible graduate program for students wishing to pursue in-depth study across subject areas of human ecology. Teachers, extension personnel, family life educators, and other professionals interested in broad-based areas will find that a diversity of subject matter combinations can be tailored to meet individual needs.

The M.S. with a major in Human Ecology offers two tracks. Track 1 is designed to meet the needs of professionals who work in programs encompassing all areas of human ecology. Track 2 is designed for students seeking initial teacher licensure in home economics education. Thesis and non-thesis options are available for both tracks.

Track 1 - The thesis option (33 hours) includes 6 hours of statistics and/or research methodology, 9 hours in program planning, implementation, and evaluation (may be selected from agricultural extension, human ecology, or other courses approved by the committee), 3 hours of Human Ecology 510, and 9 hours in courses in the college (must be selected from three departments within the college). The thesis option requires 6 hours of Thesis 500 and an oral defense.

The non-thesis option (36 hours) includes 3 hours of statistics and/or research methodology, 9 hours in program planning, implementation, and evaluation (may be selected from agricultural extension, human ecology, or other courses approved by the committee), 3 hours of Human Ecology 510, 12 hours in courses in the college (must be selected from three departments within the college) and 6 hours of approved electives. The non-thesis option requires a creative project (3 hours) and a written and oral comprehensive examination.

Track 2 - The thesis option (45 hours) includes 6 hours of statistics and/or research methodology, Human Ecology 540, 545, 574, 591, 9 hours in courses in the college (must be selected from three departments within the college) and 575 (12 hours). The thesis option requires six hours of Thesis 500 and an oral defense.

The non-thesis option (48 hours) includes 3 hours of hours of statistics and/or research methodology, Human Ecology 540, 545, 574, 591, 12 hours in courses in the college (must be selected from three departments within the college), 575 (12 hours) and 6 hours of approved electives. The non-thesis option requires a creative project (3 hours) and a written and oral comprehensive examination.

THE DOCTORAL PROGRAM

Graduate study leading to the Doctor of Philosophy with a major in Human Ecology is available in the Departments of Child and Family Studies, Health, Leisure, and Safety Sciences; Human Resource Development; Nutrition; and Textiles, Retailing, and Interior Design. Concentration areas are child development, family studies, community health, human resource development, nutrition science, textile science, and consumer environments. A major challenge of the doctoral program in Human Ecology is to draw upon the basic research generated from the natural sciences, social sciences, humanities, and the arts, and to provide a holistic perspective that contributes to the improvements of individual and family well being. Within the College of Human Ecology, research from one discipline is enhanced by encompassing and utilizing the findings of research from other disciplines.

The Ph.D. is a research degree granted only to individuals who demonstrate proficiency in conducting original research. Course requirements for the degree are determined by the student's faculty committee, based upon college and departmental requirements and student needs and interests. The Graduate School sets minimum requirements for the doctoral degree. Additionally, the college has requirements that include:

1. Selection of a concentration and fulfillment of the requirements as directed by the major professor and approved committee;
2. Minimum of 78 semester hours in courses beyond the baccalaureate degree (exclusive of master's thesis), including College Professional Seminar in Human Ecology 610, minimum of 9 semester hours of 600-level coursework (not including dissertation), and 24 semester hours of dissertation;
3. Successful completion of written/oral comprehensive examinations as provided by each department's procedures and the student's doctoral committee;
4. Original research project, which culminates in a dissertation;

More specific information about the course of study is given under the individual academic departments that administer the Ph.D. concentrations.

CONCENTRATION IN CONSUMER ENVIRONMENTS

The consumer environments concentration is designed to be most appropriate for students with interests in retail and consumer sciences, foodservice and lodging administration or interior design.

Requirements are a minimum of 90 hours including:
1. HE 530.
2. HE 610.
3. HRA 532, ID 510, and RCS 550 or 641.
4. HRA 537 or RCS 590 or ID 590 (2 hours).
5. Minimum 9 hours of statistics and research methods.
6. Six hours from RCS 511, 550 or 641, ID 575, 625, HRA 555, 610, 620.
7. Twenty-four hours of dissertation.
8. Electives for 34 hours approved by the committee, including a minimum of 9 hours required at the 600 level. (Students must take at least 18 hours in one of three specialty areas: foodservice and lodging administration, retail and consumer sciences, or interior design.)

MINOR IN GERONTOLOGY

An interdepartmental/interdisciplinary minor in gerontology gives the graduate student an opportunity for combining the knowledge and experience about aging in American society with his/her own major concentration.

Core courses and a practicum are offered by the College of Social Work and selected departments within the Colleges of Human Ecology, Education, and Arts and Sciences. A cross-listed seminar between contributing programs is designed to integrate experiences from different sources and to demonstrate the multi-faceted nature of working within an aging society.

Declaration of a Minor

Prior to earning more than one-half the total hours required for this minor, students must complete a "Declaration of a Minor in the College of Human Ecology" form. Copies of this form are available in the Dean's Office, Room 110, Jessie Harris Building.

Core Experience

Students must complete a core experience of 12 semester hours taken from at least three different departments including nine hours taken from outside the major department. Coursework needs to comply with the following framework:

1. Coursework; 9 hours required. A variety of coursework may be taken toward satisfaction of this requirement. Courses which are offered on a regular basis include: Health 406, 485, Health/ Public Health 650, Interior Design 575, Nutrition 518, Public Health 523, Social Work 666, Sociology 415, Adult Education 322, 513.

2. Applied practicum. 2 hours required. Students should register under practicum experiences in the "home" department of the supervising faculty.


4. Successful completion of a written comprehensive examination covering subject matter of the minor.

Graduates Committee

At least one faculty member from the Gerontology Policy Committee who is qualified to work with graduate students, must serve on the graduate committee of each student who declares a gerontology minor. Contact Dr. Jim Moran, Associate Dean in Human Ecology, for a current list.

Admission to Candidacy

When application is made for admission to candidacy, indication of the minor must be noted on the Admission to Candidacy form.

ACADEMIC COMMON MARKET

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

GRADUATE COURSES

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

501 Microcomputer Research Applications in Human Ecology (3) Advanced microcomputer concepts and applications for research. Overview of statistical analysis software, computer graphics, computer-assisted design and national data base searches.

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

510 Integrative Nature of Home Economics (3) History and philosophy of home economics. Analysis of current programs and future directions in field. Examination of research, integrative framework. F,A

520 Directed Study in Human Ecology (1-3) Integrative topics. Prerequisite: Successful completion of graduate study in college including courses from at least two departments or consent of instructor. May be repeated. Maximum 6 hrs. E

525 Practicum in Home Economics (1-6) Field based experiences. Prerequisite: Consent of instructor. E

530 College Teaching in Human Ecology (3) Instructional effectiveness; techniques, organization, and evaluation. Prerequisite: Consent of instructor. Sp

540 Curriculum in Human Ecology (3) Program planning, design of instruction and development of teaching materials for human ecology classrooms. Prerequisite: 325. Coreq: 575. F

545 Evaluation in Home Economics Education (3) Assessment of programs and pupil progress; techniques, methods, and uses. Prerequisite: 540. Corequisite: 575. F,Sp,A

583 Family Life Education Programs (3) Same as Child and Family Studies 583.

574 Analysis of Teaching for Professional Development (2) Strategies to document and analyze effectiveness of teaching and professional development. Study and application of various approaches. Corequisite: 575. F

575 Professional Internship in Teaching (1-8) Intensive teaching and teaching-related experiences in professional settings in public schools. Enrollment limited to post-baccalaureate students in professional year program. Prerequisite: Admission to Teacher Education Program. May be repeated. Maximum 12 hours. S/N/C only. F,Sp

580 Special Topics in Home Economics Education (1-3) Current issues and trends in home economics. Prerequisite: Consent of instructor. May be repeated. S,Sp

581 Directed Study in Home Economics Education (1-3) Prerequisite: Consent of instructor. May be repeated. E

585 Seminar in Gerontology (1) Scope of gerontology as discipline and as related to other academic and professional disciplines. Speakers both internal and external to UT-K. Prerequisite: Consent of instructor. May be repeated. Maximum 3 hrs. (Same as Counselor Education and Counseling Psychology 585). Exercise Science 565, Nursing 585, Public Health 585, Psychological Studies 585, Social Work 585, and Sociology 585). S/N/C only.

591 Clinical Studies (4) Group and individual seminar activities during at least 8 hrs of internship. Application and evaluation of professional core competencies. Completion and presentation of portfolio and analysis of teaching project. Corequisite: 575.

610 Professional Seminar in Human Ecology (3) Review of various approaches taken by different disciplines to study of ecology; ecological applications in human ecology; temporal/spatial properties of human ecosystems; model building/ systems thinking and futures thinking in human ecology. Sp

Human Resource Development

(College of Human Ecology)

MAJORS

Human Ecology Ph.D.
Human Resource Development M.S., Ed.D.
Vocational-Technical Education Ed.S.

Peter Dean, Head

Professors:
Campbell, C.P., Ed.D. .......... Maryland
Cheek, Gerald D., Ph.D. .......... Kansas State
Coakley, Carroll B. (Liaison). Ph.D. .......... Wisconsin
Craig, D.G., Ed.D. .......... Cornell
Hanson, R., Ph.D. .......... Purdue
Haskell, R.W., Ph.D. .......... Purdue
Matthews, John L. (Emeritus), Ph.D. .......... Arizona State
Reed, J.L. (Emeritus), M.S. .......... Oklahoma State
Wegener, G.A. (Emeritus), M.S. .......... Indiana

Associate Professors:
Dean, Peter J., II, Ph.D. .......... Iowa
Ledford, B.J., Ed.D. .......... Tennessee
Mann, E.C., Ed.D. .......... Florida State
McGinnis, Jackie H., Ph.D. .......... Missouri

Assistant Professors:
Mimbs, Cheryl, M.S. .......... Virginia Tech
Pierce, R., Ph.D. .......... Ohio State
Powell, Terrence L., M.S. .......... Oklahoma

THE MASTER'S PROGRAM

The Department of Human Resource Development offers graduate programs leading to the Master of Science with a major in Human Resource Development. Two tracks are available. Track 1 is for students who are already certified to teach or those who are seeking a master's degree without certification. Track 2 is for students seeking initial licensure. Thesis and non-thesis options are available for both tracks.

Track 1 - Concentrations are available in business and management education, industrial education, training and vocational-technical education. The thesis option requires the completion of 33 semester hours including 6 hours of thesis. The non-thesis option requires the completion of 36 hours of coursework.

Track 2 - Concentrations are available in business and management education, and technology education. The non-thesis requirement is Human Ecology 574 and 591, 6 hours; for business and marketing education, 531 and 532, 6 hours; for technology education, 553 and 555, 6 hours; internship, 12 hours; and 12 hours of specialty courses as approved by the student's committee for a total of 42 hours. The thesis option requires 6 additional hours of thesis 500 for a total of 48 hours.

THE DOCTORAL PROGRAM

The comprehensive Ed.D. program in the department is designed to provide opportunities for graduate students to achieve professional objectives, develop competencies, and gain desirable experiences and understanding of human resource development.

The minimum requirements in the doctoral program consist of the following: department specialization, 12 hours; comprehensive examination, 9 hours; research methods, 12 hours; dissertation, 24 hours; and internship, 9 hours above the baccalaureate requirement. The Doctor of Philosophy with a major in Human Ecology offers a concentration in human resource development.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The Ed.D. program in Human Resource Development is available to residents of Kentucky and West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

401 Utilization of Community Resources (3) Strategies of developing linkages between vocational education and public sector through advisory committees, councils, and working partnerships. Development and management of public relations programs. Prerequisite: 3 yrs teaching experience. Sp

415 Coordination Techniques (3) Necessary procedures and duties and responsibilities to implement, maintain, and evaluate successful cooperative education program. Prerequisite: Senior standing and consent of instructor. Sp

430 Principles and Organization of Business and Marketing Education (3) Historical background and development needs. Principles of vocational education in business and marketing, curriculum implications; establishing, evaluating, and improving programs.

432 Methods and Materials in Business and Marketing Education (3) Teaching techniques, aids and evaluation in subject matter fields. Prerequisite: Consent of instructor. F

436 Supervised Occupational Experience (3-9) Practical work experience in business and marketing settings under supervision of practitioner and department representative. May be repeated. Maximum 9 hrs.

439 Areas of Marketing (3) Marketing, personnel development, operations, and management as affected by instructional leadership program in marketing education. Prerequisite: 432. F
500 Thesis (1-15) P/NP only, E
502 Registration for Use of Facilities (3-15) Required
503 Problems in Lieu of Thesis (3) May be repeated. Maximum 6 hrs. S/NC only. E
505 Selection, Placement, and Follow-up Procedures in Human Resource Development (3) Methods and procedures in establishing criteria for trainee selection and placement in instructional programs and in jobs. Collecting, analyzing, and reporting follow-up data appropriate for making program improvements. Prereq: Consent of instructor. F, Su
509 Internship in Human Resource Development (3) Practical field experiences in selected settings under supervision of practitioner and departmental representative. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E
510 Foundations of Human Resource Development (3) Historical, philosophical, economic, social, and psychological foundations of vocational, technical, and adult education. Supervision of special students. Prereq: 9 hrs of graduate credit. F, Su
512 History and Philosophy of Industrial Education (3) Social, political, and economic events that impact development of industrial education. Philosophical problems: Justification, values, principles and concepts of industrial education. Prereq: Consent of instructor. F, Su
534 Curriculum and Instructional Leadership (3) Theoretical and experiential preparation in developing, implementing, and evaluating programs in educational and human resource development. Prereq: Consent of instructor. F, Su
535 Supervision of Industrial Education Programs (3) Techniques used to improve industrial education programs. Staff development, curriculum improvement, and program upgrading techniques. Prereq: 456 or equivalent. F, Su
541 Supervision of Education Programs (3) Supervision of educational programs in instructional, related training, and human resource development. Planning, implementation, supervision, and evaluation of training programs. Prereq: Consent of instructor. F, Su
551 Supervision of Industrial Education Programs (3) Techniques used to improve industrial education programs. Staff development, curriculum improvement, and program upgrading techniques. Prereq: 456 or equivalent. F, Su
556 Staff Development Programs (3) Strategies for assessing, planning, and implementing programs for professional development of non-technical personnel. Prereq: Consent of instructor. F, Su
557 Evaluation of Technical Training Programs (3) Planning and evaluation of technical training programs. Prereq: Consent of instructor. F, Su
558 Seminar in Industrial Education (1-3) Current issues, innovations; problems associated with technical programs. Prereq: 12 hrs of graduate courses. May be repeated. Maximum 6 hrs. E
559 Evaluation of Technical Training Programs (3) Planning and evaluation of technical training programs. Prereq: Consent of instructor. F, Su
560 International Perspectives of Workforce Training (3) Examination and comparison of workforce systems in highly industrialized countries. In-school training programs, out-of-school training systems, equipment maintenance and management, training-related issues, technological changes, and role of training and development programs. Prereq: Consent of instructor. F, Su
562 Seminar in Human Resource Development (3) Current issues, innovations; problems associated with technical programs. Prereq: Consent of instructor. F, Su
564 Self-Directed Work Teams (3) Theory and practice of implementing self-directed work teams, motivating employees, increasing employee productivity via teams and related issues.
600 Doctoral Research and Dissertation (3-15) P/NP only, E
601 Curriculum Planning in Human Resource Development (3) Curriculum theory, models, content, planning, evaluation and implementation of specialized program areas. Prereq: 540 or equivalent. F, Su
610 Research Development in Human Resource Development (3) Proposal development, theoretical base, research design, sampling, application of statistics, and evaluation of research in human resource development. Prereq: 640 or advanced statistics course and consent of instructor. F, Su
611 Internship in Human Resource Development (3) Field experience in relevant organizations. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E
613 Special Topics in Human Resource Development (3) Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. E

Inclusive Early Childhood Education
(College of Education)

MAJORS

MAJORS

DEGREES

Curriculum and Instruction M.S., Ed.S., Ed.D.
Education Ph.D.
Special Education Ph.D.

Susan Benner, Leader

Professors:

Benner, Susan M., Ed.D. Columbia
Blank, Kermit J., Ph.D. Ohio State
Coelman, Laurence J., Ph.D. Kent State

Hatch, J. Amos, Ph.D. Florida

Associate Professor:

Cagle, Lynn C., Ed.D. Georgia

Assistant Professor:

Lesar, Sharon H., Ph.D. California (Santa Barbara)

The Inclusive Early Childhood Education unit offers graduate programs leading to the Master of Science with a major in Curriculum and Instruction, concentrations in elementary education and elementary teaching, and in Special Education, concentration in early childhood special education; and the Ed.S., and Ed.D. in Curriculum and Instruction. The unit also participates in the college-wide Ph.D. program with a major in Education. See Education under Fields of Instruction for full description of all degree requirements.

A program of study is available in early childhood education leading to licensure to teach pre-K through grade 3. This program is available through the Department of Child and Family Studies in the College of Human Ecology in collaboration with the College of Education. In
addition to the licensure program, master's degree programs may be completed in the College of Education or the College of Education.

For further information, write the unit leader.

**GRADUATE COURSES**

445 Early Childhood Education: Program Development and Teaching in Kindergarten (3) Curriculum planning, classroom organization and management, practices for teaching young children; relationship of kindergarten to total elementary school. Prerequisite: Admission to teacher education. E

454 Education of the Gifted and Talented Children (3) Orientation to psychometric and behavioral studies of giftedness; analysis of past and present school practices in reference to curriculum and program implementation. Sp

471 Early Childhood Special Education (6) Assessment, curriculum planning and development and teaching approaches used in early childhood special education. Prerequisite: Admission to teacher education. F

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

502 Registration for Use of Facilities (3-15) Required. Maximum 9 hrs. S/NC or letter grade. (Same as Rehabilitation and Deafness 504.)

515 Seminar (1-3) Curriculum, instructional technology, elementary education, secondary education, or social foundations as related to goals of student program. May be repeated. Maximum 6 hrs. S/NC only. E

518 Educational Specialist Research and Thesis (3) May be repeated. P/NP only. E

554 Clinical Experience in Teaching and Supervision of Exceptional Children (3-9) Placement in educational settings. May be repeated. Maximum 9 hrs. S/NC or letter grade. (Same as Rehabilitation and Deafness 504.)

564 Psychosocial Development of Gifted and Talented Children (3) Phenomena of talent development in context of home, school, and society; implications of maladjustment. Practices for promoting social and emotional development. Prerequisite: 451 and 452 or equivalent. E

565 Instructional Systems for the Gifted and Talented (3) Instructional methods and systems evaluated in terms of effectiveness in various educational environments. Prerequisite: Coreq: 564 or consent of instructor. E

566 Curriculum for Early Childhood Education (K-3) (3) Theoretical foundations and current research in content and skill areas of curriculum for kindergarten-grade 3; application to local school setting. Prerequisite: Consent of instructor. May be repeated. Maximum 6 hrs. S/NC or letter grade. E

567 Application of Theory in Early Childhood Education (K-3) (3) Theoretical perspectives of early childhood education; exploration of programmatic models, family-focused concepts and curriculum development. E

575 Creative Problem-Solving Strategies for Special Educators (3) Techniques for solving problems encountered by special educators in any setting. E

579 Special Topics (1-3) P/NP only. E

584 Seminar in Early Childhood Education (3) Analysis of research and theory in early childhood education; educational process of young children. Prerequisite: Course in early childhood education. May be repeated. Maximum 6 hrs. Sp,Su

591 Clinical Studies (4) Relationship between educational theory and application during internship; research project, development of portfolio, and capstone experience. E

593 Independent Study (1-3) May be repeated. S/NC or letter grade. E

594 Supervised Readings (1-3) May be repeated. S/NC or letter grade. E

595 Special Topics (1-3) May be repeated. S/NC or letter grade. E

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

604 Seminar in Curriculum and Instruction (1) Required. 2 consecutive semesters. S/NC only. E

610 Internship in College Teaching and Supervision (1-3) Supervised practice in college teaching and supervision. Prerequisite: Admission to doctoral program or consent of instructor. May be repeated. Maximum 9 hrs. S/NC only. E

620 Internship in Research in Special Education and Rehabilitation (3-9) Placement with professional engaged in theoretically-based research: public school, institutions, agencies or university settings. Prerequisite: 9 hrs in statistical and research methods. May be repeated. Maximum 9 hrs. S/NC only. E

630 Internship in Institutional Leadership in Special Education and Rehabilitation (3-9) Advanced level field experiences under supervision of practitioner. Prerequisite: Consent of instructor. May be repeated. Maximum 9 hrs. S/NC only. E

650 Advanced Studies in Early Childhood Education (3) Prerequisite: 2 graduate courses in early childhood education and consent of instructor. May be repeated. Maximum 6 hrs. S/NC only. E

679 Special Topics (1-3) P/NP only. E

689 Internship (1-3) Experiences in application of principles and practices of curriculum development and instructional improvement. Prerequisites: Program prerequisites and consent of instructor. May be repeated. Maximum 9 hrs. S/NC only. E

693 Independent Study (1-3) May be repeated. S/NC or letter grade. E

694 Supervised Reading (1-3) May be repeated. S/NC or letter grade. E

695 Special Topics (1-3) May be repeated. S/NC or letter grade. E

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**Industrial and Organizational Psychology**

(Industrial and Organizational Psychology includes psychology, business administration, engineering, science, and liberal arts. The first-year program provides the opportunity to take courses that will assist the students in attaining a reasonable level of sophistication in areas of deficiency.)

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**ADMISSION REQUIREMENTS**

Applicants for admission should request information and application forms from both the Graduate School and the Director of the Industrial and Organizational Psychology Program. Applicants should submit an undergraduate grade point average of 3.0 or above, and have completed the following: one year of college mathematics and a course in statistics. Applicants should also have completed one year of college economics and one year of college psychology. Applicants should have completed a course in psychology, business administration, engineering, science, and liberal arts. The first-year program provides the opportunity to take courses that will assist the students in attaining a reasonable level of sophistication in areas of deficiency.

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**General Requirements**

At least one year of college mathematics and one course in statistics are required. Ordinarily, an undergraduate grade point average of 3.0 or above is required with no evidence of special weakness in mathematics and physical sciences.

Test scores on each section of the general verbal and quantitative of the Graduate Record Examination (GRE) are required. Customarily, those students admitted to the program have performed at or above the 60th percentile on the general tests. (This corresponds to a raw score of approximately 600 on each of the tests.)

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**THE MASTER'S PROGRAM**

A thesis is required with 6 semester hours of Management or Psychology 500.
The master's degree can be completed with a minimum of 33 semester hours in the major as follows:

Management 567, 568 or Psychology 517-18; Psychology 557, Statistics 537, 538.

Twelve hours of additional coursework to be selected primarily from the following with the approval of the student's advisor: Management 511, 522, 610; Management/ Psychology 625, 626, 627, 638; Psychology 505, 550, 610, 620, 624.

Electives, as approved for an individual's plan of study, may be selected from graduate courses in psychology, social work, sociology, management, education, planning, etc. Students who wish to pursue special research interests aside from their thesis may register for Management 525, 526 (Maximum 6 hrs per term; courses may be repeated) or Management/ Psychology 690.

An internship, practicum, or field experience is recommended. A student is expected to be in residence full time one year (two years recommended).

A master's candidate must pass a final oral examination.

In addition to course requirements, a master's student must complete a comprehensive examination in general psychology within no more than two years by attaining a score of 630 (or 65th percentile) on the Subject GRE (Psychology-81).

An overall "B" average is required in the course sequence Management 567-68 or Psychology 517-18 to continue in the program beyond the first year.

THE DOCTORAL PROGRAM

Any student in the doctoral program may be required to prepare a master's thesis by the Industrial and Organizational Psychology Committee. This policy will be implemented by the committee at such time as a review of the student's record suggests that additional data on the qualifications for pursuing a Ph.D. are required.

A dissertation is required with a minimum of 24 semester hours of Management or Psychology 600.

The doctoral degree can be completed with a minimum of 54 semester hours in the major as follows:

Management 567-88 or Psychology 517-18, Psychology 557, Statistics 537-58.

A minimum of five doctoral seminars (15 hours) selected from: Management 610; Management/ Psychology 625, 626, 627, 638; Psychology 620, 624. (Five doctoral seminars are viewed as the absolute minimum; more are recommended. Statistics 671 and Psychology 685 are also recommended.)

Electives, as approved for an individual's plan of study, may be selected from graduate courses in psychology, social work, sociology, management, education, planning, etc. Students who wish to pursue special research interests aside from their dissertation may register for Management 525, 526 (Maximum 6 hrs per term; courses may be repeated) or Management/ Psychology 690.

An internship, practicum, or field experience is recommended. A student is expected to be in residence full time one year (two years recommended).

Doctoral candidates must pass a final oral examination on their dissertation research.

In addition to course requirements, a doctoral student must attain a score of 850 (90th percentile) on the Subject GRE (Psychology-81) within two years of entry, successfully complete the qualifying examination covering scientific methodology before or during the third fall semester, and successfully complete the comprehensive examination in the areas of the student's major research and professional interests.

An overall "B" average is required in the course sequence Management 567-68 or Psychology 517-18 to continue in the program beyond the first year.

ACADEMIC COMMON MARKET

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

Industrial Engineering

(Graduate Program in Engineering)

MAJOR

Industrial Engineering

DEGREE

M.S.

C. H. Aikens, Head

Professors:

Bontadelli, J. A., P.E., Ph.D. .......... Ohio State
Claycombe, W. W., Ph.D., P.E. ....... VPI
DePorter, Elden L., Ph.D., P.E. ......... VPI
Devine, Michael D., Ph.D. .......... Texas Tech
Douget, Dan C., Ph.D. (Emeritus), P.E., M.S. .......... Tennese
Garrison, G. W. (UTSI), Ph.D. .......... NC State
LaForge, R. M. (Emeritus), P.E., M.S. .......... Georgia Tech
Loveless, Howard L. (Emeritus), P.E., M.S. .......... NC State
Schmitt, Harold W., Ph.D. .......... Texas Snier, John N., P.E., Ph.D. .......... Ohio State

Associate Professors:

Aikens, C. H. (Liaison), P.E., Ph.D. .......... Tennessee
Hailey, M. L. (UTSI), P.E., Ph.D. .......... Tennessee
Hungerford, J. C., Ph.D. .......... Ohio State
Hutchinson, D. H., Ph.D. .......... Georgia Tech
Jackson, D. F., Ph.D. .......... Tennessee
Kirby, K. E., Ph.D. .......... Tennessee
Parkinson, E. L. (UTSI), Ph.D. .......... Florida

Assistant Professors:

Chatterjee, S., Ph.D. .......... VPI
Goodman, Marvin K. (Emeritus), P.E., M.S. .......... Tennessee
Sawhney, Rupy S., Ph.D. .......... Tennessee

The Department of Industrial Engineering offers a graduate program leading to the Master of Science degree with major in Industrial Engineering, concentrations in traditional industrial engineering and engineering management.

The Ph.D. with a major in Engineering Science is available through the Department of Engineering Science and Mechanics with a specialization in industrial engineering.

THE MASTER'S PROGRAM

Students who enroll in the Master of Science degree may select a concentration in either industrial engineering or engineering management. Admissions are open to graduates of ABET-accredited undergraduate curricula in engineering, or to graduates of other technical curricula who satisfy the prerequisites depending on their academic background and industrial experiences. Policies concerning prerequisite requirements will be determined by the Industrial Engineering faculty.

Industrial Engineering

Under the industrial engineering concentration, students may select either a thesis or non-thesis option. The thesis option requires 24 hours of coursework plus a full-time thesis. The non-thesis option requires 30 hours of coursework plus a 3-hour industrial design project.

Depending upon a student's background and career objectives, graduate work in industrial engineering enables the student to select an area of specialization from operations research, manufacturing and production systems, human factors engineering, information systems engineering, quality and reliability engineering, or general industrial engineering.

Engineering Management

The engineering management concentration has an additional admission requirement of two years' industrial experience as a practicing engineer or scientist, or current full-time employment in an appropriate engineering or applied science position. The program is non-thesis and requires 33 hours of coursework plus a 3-hour capstone project. This concentration is fully supported off-campus utilizing electronic media for video taping and interactive distance teaching methods.

Note: Any 400-level course required in the Bachelor of Science in Industrial Engineering program at UT Knoxville may not be used for graduate credit in the M.S. degree program.

Industrial Engineering

GRADUATE COURSES


402 Production System Planning and Control (3) Theory and application of forecasting systems, regression and time series models, independent demand inventory models, development of safety stock, coverage of all modules of Manufacturing Resource Planning (MRP) Systems: master production scheduling, resource requirements planning, bill of material and inventory file structures, material requirements planning, capacity planning, shop floor and purchase order control. Overview of
Production Facilities Design and Material Handling (3) Design of production facilities; plant layout, analysis and planning for over-all moving, packaging and storage of materials. Office layout and service areas. Design of facilities for such diverse groups as hospitals, banking, industrial sites.

Engineering Economy (3) Methods and problems in selection or replacement of equipment. Decision among engineering alternatives involving capital recovery, economic life of equipment and cost of rate of return on investment.


Hazard recognition, analysis, and control and management of safety organizations and systems. Prereq: Senior standing.

Evaluation of systems of information. Informational analysis and presentation. Prereq: 402 and consent of instructor. (Same as Engineering Management 516.)

Reliability Engineering (3) Continuous time random processes with applications to availability of equipment and manufacturing systems. Failure data and failure data analysis. Maintainability, reliability-based criteria for product acceptance. Prereq: 516.

Advanced Engineering Economy (3) Application of engineering economic analysis in complex decision situations. Inflation and price changes, uncertainty evaluation using nonprobabilistic and probabilistic methods, project allocation. Prereq: Probability and Statistics for Scientists and Engineers I and 405, or equivalent. (Same as Engineering Management 516.)

Human Factors Engineering and Ergonomics (3) Application of human factor and ergonomic concepts and principles to design and analysis of man-machine systems and products. Human as biomechanical system; human information processing; minimalization of human error; anthropometry; anatomy and physiology; physical and mental workloads; effects of environmental factors; test methods; instrumentation, data collection and analysis. Prereq: 402 and 403, and 404.


Total Quality Management (3) Philosophy of continuous improvement in organizations: management and implementation issues; definition, identification and analysis of systems, process procedures and improvements; flowcharts, parto charts, cause and effect diagrams and seven new tools; data collection and control strategies; capability and quality of design; components of variation; measurement issues; issues relevant to continuous processes; managing quality in short-run environments; uses of statistical tools; correlation and regression; design of experiments; the system value. Lab. Prereq: Quality Control or consent of instructor.

Advanced Human Factors Engineering Methodology (3) Advanced methodologies used in human factors engineering. Observational methods; function/task analysis; computerized human factors design methods; human reliability and error prediction; evaluation of human-machine interfaces; modeling techniques; psychological and survey designs; design evaluation and other selected topics. Prereq: 519 or consent of instructor.

Optimization Methods in Industrial Engineering (3) Classical optimization applied to constrained and unconstrained, non-linear, multi-variable functions; search techniques; decision making under uncertainty; game theory; and dynamic programming. Prereq: Operations Research or Engineering Management 537.

Linear Programming and Extensions (3) Simplex and revised simplex methods; duality; parametric and post-optimal analysis; and quadratic, separable, integer, goal, and fuzzy linear programming. Prereq: Operations Research or Engineering Management 537.


Dynamic System Simulation (3) Discrete, continuous, and combined systems simulation using current simulation software. Models of simulation, design of simulation experiments, and analysis of output. Prereq: Probability and Statistics for Scientists and Engineers I.

Lean Production Systems (3) Characteristics and performance of mass and lean production systems. Lean production concepts and principles. Planning, designing and implementing lean production systems: time balancing, set-up time reduction, cost management, maintenance support and other selected topics. Application at enterprise level to achieve strategic competitive goals. Prereq: 519 or consent of instructor.

Special Topics in Industrial Engineering (3) Individual or group research projects. Prereq: Consent of instructor. May be repeated.


Advanced Topics in Optimization (3) Multi-stage optimization theory. State increment dynamic programming and adaptive optimization theory. Prereq: 603.


Advanced Topics in Human Factors, Safety and Biomechanical Engineering (3) Application of advanced engineering analysis and design methods to man-machine systems and products. Human as biomechanical system; human information processing; minimalization of human error; anthropometry; anatomy and physiology; physical and mental workloads; effects of environmental factors; test methods; instrumentation, data collection and analysis. Prereq: 402 and 403.


Total Quality Management (3) Philosophy of continuous improvement in organizations: management and implementation issues; definition, identification and analysis of systems, process procedures and improvements; flowcharts, parto charts, cause and effect diagrams and seven new tools; data collection and control strategies; capability and quality of design; components of variation; measurement issues; issues relevant to continuous processes; managing quality in short-run environments; uses of statistical tools; correlation and regression; design of experiments; the system value. Lab. Prereq: Quality Control or consent of instructor.

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Total Quality Management (3) Philosophy of continuous improvement in organizations: management and implementation issues; definition, identification and analysis of systems, process procedures and improvements; flowcharts, parto charts, cause and effect diagrams and seven new tools; data collection and control strategies; capability and quality of design; components of variation; measurement issues; issues relevant to continuous processes; managing quality in short-run environments; uses of statistical tools; correlation and regression; design of experiments; the system value. Lab. Prereq: Quality Control or consent of instructor.

Advanced Human Factors Engineering Methodology (3) Advanced methodologies used in human factors engineering. Observational methods; function/task analysis; computerized human factors design methods; human reliability and error prediction; evaluation of human-machine interfaces; modeling techniques; psychological and survey designs; design evaluation and other selected topics. Prereq: 519 or consent of instructor.

Optimization Methods in Industrial Engineering (3) Classical optimization applied to constrained and unconstrained, non-linear, multi-variable functions; search techniques; decision making under uncertainty; game theory; and dynamic programming. Prereq: Operations Research or Engineering Management 537.

Linear Programming and Extensions (3) Simplex and revised simplex methods; duality; parametric and post-optimal analysis; and quadratic, separable, integer, goal, and fuzzy linear programming. Prereq: Operations Research or Engineering Management 537.

531 Motivation and Culture in Engineering Management (3) Motivational theories and practice to improve individual and organizational capabilities. Success in meeting goals, improving productivity, innovation, and leadership and personal interpersonal skills. Improvements through organizational structure, policies, and work design. Prereq: 533 or consent of instructor.

532 Productivity and Quality Engineering (3) Productivity and quality measures defined and used to analyze current competitive position of important sectors of American industry with respect to national and international competition. Study of management theorists and systems which promote or inhibit productivity or quality improvements.

533 Theory and Practice of Engineering Management (3) Manager's perspective; business definition; strategic planning and management; marketing and competition in global economy; finance; organization; systems thinking; team building; corporate culture and leadership in new organization; and quality, empowerment, and learning organizations. Principles of application to setting cases and setting of cases.


535 Management of Technology (3) Creativity and innovation; incorporation of advanced technology equipment; application of systems thinking; new methods in business and manufacturing organizations; justifying technology; assimilating and managing change, changing management roles, and impacts of new technologies. Prereq: 531 and Industrial Engineering 518.

536 Project Management (3) Development and management of engineering and technology projects. Project proposal preparation; resource and cost estimating; and project planning, organizing, and controlling; network diagrams and other techniques. Role of project manager; team building, conflict resolution, and contract negotiations. Discussion of typical problems and alternative solutions. Case studies and student projects. Prereq: 537 or consent of instructor.

537 Analytical Methods for Engineering Managers (3) Survey of management analysis and control systems through IE techniques. Qualitative and quantitative systems: methods analysis, work measurement; incentive systems, wage and salary development, production and inventory control, linear programming, and applied operations research techniques. Not for credit for students with undergraduate degrees in industrial engineering.

538 New Venture Formation (3) Factors other than mechanical engineering principles in the establishment of manufacturing or service enterprise. Organizational and financial planning and evaluation. Cost and location studies and market analysis to determine commercial feasibility of new ventures. Prereq: 539.

539 Strategic Management in Technical Organizations (3) Strategic planning process and strategic management in practice: corporate vision and mission; product, market, organizational, and financial strategies; external factors; commercialization of new technologies; and competition and beyond. Prereq: 533 and Industrial Engineering 518.


541 Total Quality Management and Beyond (3) Continuous improvement in capabilities, competitiveness, and productivity of organizations. Principles of total quality management; systems theory and analysis; performance measurement; and application of statistical techniques in continuous improvement. Team building and leadership issues, and case studies. Prereq: 516.


Information Sciences

Prerequisites:

- Estes, Glenn E. (Liaison), M.L.S. (Kent State Griffiths, Jose-Marie, Ph.D.)
- Penniman, W. David (Ph.D.)
- Purcell, Gary R. (Emeritus)
- Tenopir, Carol, Ph.D., M.S. (Case Western Reserve University)
- Wilson, P. (Emeritus), Ph.D., M.S. (Indiana University)
- Fisher, Patricia L., Ph.D. (Florida State University)
- Pemberton, J. Michael, Ph.D. (Tennessee Technological University)
- Pollard, Richard, Ph.D., M.S. (Brunei University)
- Robinson, William C., Ph.D., M.S. (Illinois State University)
- Sinkankas, George M., Ph.D., M.S. (Pittsburgh State University)
- Bohstedt, Jinx, Ed.M., Harvard University
- Wang, Pelling, Ph.D., M.S., Maryland University
- Whitney, Gretchen, Ph.D., M.S. (Michigan State University)

The School of Information Sciences provides a program leading to the preparation of librarians and information professionals for work in all types of libraries and information centers. The program of study includes a graduate curriculum leading to the Master of Science degree. The program is accredited by the American Library Association. A Ph.D. degree program may also be pursued with a major in Communications, information systems, and public service programs.

The mission of the school is to educate people to live, work, and flourish in an information society through excellence in teaching, research, and public service. The program degree requirements are:

- A. To conduct basic and applied research which strengthens its instructional and public service programs.
- B. To provide services to the state, region, and nation in association, consulting, and continuing education activities which will promote the development and improvement of information systems and services such that the school's contributions extend beyond its immediate academic programs. The school will provide:
  1. Continuing education for information professionals and, on a selective basis, to persons outside the information field.
  2. Advisory services to information organizations.
  3. Leadership for professional associations.
  4. To conduct basic and applied research which promotes the generation of new knowledge, services and technology. The school will encourage:

- Research which strengthens its instructional and public service programs.
- The use of a variety of research methods.
- Sharing the results of its research.
- Increased research quality and productivity.

ADMISSION REQUIREMENTS

Applicants to the Information Sciences program must have a minimum undergraduate grade-point average of 3.0 or a satisfactory graduate degree grade-point average for admission as a potential candidate for the MS degree.

The verbal, quantitative and analytical aptitude portions of the Graduate Record Examination (GRE) are required of all applicants unless a graduate degree has been completed prior to application for admission. Applicants should take the GRE at least one semester in advance of application for admission and are expected to score 1500 points or better.

A personal data sheet and three recommendations (obtained from the School of Information Sciences) should be returned to the admissions office of the school. Foreign applicants are required to take the Test of English as a Foreign Language.

THE MASTER'S DEGREE

The program leading to the Master of Science involves a total of 43 semester hours of graduate courses, 16 hours of which form a core curriculum required of all students. Either a thesis or a non-thesis option is available, with 6 hours required for thesis credit. At least 37 hours must be taken in the School of Information Sciences, allowing up to 6 hours outside the school with a maximum of 6 from outside the University. Upon completion of the program, all students are subject to a final examination. For students who elect the thesis option, the examination will be a defense of the thesis. Students who elect the non-thesis option will be given a written comprehensive examination.

Core Curriculum

The core curriculum is a 16 semester hour sequence of six courses required of all students: 490, 520, 530, 580, 580. These courses address the evolving information environment; foundations of information sciences and technologies; information resources selection, acquisition and
evaluation; information content representation; information access and retrieval. The core curriculum includes a one-hour electronic information and communications laboratory experience required of students during the first semester: 504.

The 16 hour core is prerequisite to all elective courses for students enrolled in the MS degree program. Elective courses may begin in the final semester of core course work with permission of the advisor and the instructor of each elective course selected.

Concentrations

Upon completion of the core curriculum, students may select a concentration from one of the following:

Corporate Information Systems and Services: The concentration includes 18 hours (550, 553, 564, 567, 585, 599) of required courses and 9 hours of elective courses, one selected from each of these groups: Group A (534, 555, 565, 592); Group B (531, 532, 533, 537, 558); Group C (562, 583, 564).

Electronics and Communications: The concentration includes 18 hours (537, 561, 563, 565, 585, 587) of required courses and 9 hours of elective courses, one selected from each of these groups or all electives selected from one group: development and design aspects (430, 523, 555, 586, 589, Journalism 460 or 535 or 580); standards and technical aspects (567, 583, 584, 589, 599); policy and market aspects (538, 559, Communications 550 or 580).

Information Systems and Technology: The concentration includes 18 hours (540, 583, 584 or 588, 587, 588, 599) of required courses and add 9 hours of elective courses.

Scientific and Technical Information: The concentration includes 18 hours (450, 532, 535, 540, 555, 599) of required courses and 9 hours of elective courses.

Youth Services in Public and School Libraries: The concentration includes two specializations: public library youth services and school library media services. Within the concentration, 21 hours (567, 571, 572, 573, 585, 599, one elective) are common and 6 hours are taken in the specialization (public library: 564, 592; school library: 475, 551).

FINANCIAL ASSISTANCE OPPORTUNITIES

Employment with the University of Tennessee Libraries may prove a work-study opportunity for selected students who wish to obtain experience in academic librarianship while pursuing the degree. Such students usually work at least 20 hours each week and thus may extend the period required for the degree. Similar opportunities exist with some other libraries and information agencies in the Knoxville area.

Work opportunities in a scientific-technical environment are available through subcontracts with Oak Ridge National Laboratory and the Department of Energy. A limited number of graduate teaching assistantships are available through the school. Assistantships of this type carry a waiver of tuition and fees as well as a stipend and require that recipients work 10 hours per week in the school.

For application forms and information about financial aid and other information about the M.S. in Information Sciences, write to Admissions, School of Information Sciences, University of Tennessee, 804 Volunteer Blvd., Knoxville, TN 37996-4330

ACADEMIC COMMON MARKET

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

GRADUATE COURSES

430 History of the Book (3) History of writing and various methods of bookmarking.

450 Writing About Science, Technology and Medicine (3) (Same as Journalism 480).

475 Utilization of Instructional Media (3) (Same as Education in the Sciences, Mathematics, Research and Technology 475). E

485 Electronic Communications and Information Resources on Internet (3) Exploration of worldwide information and communication resources including e-mail, gopher, Archie, Veronica, WAIS, WWW, and newsgroups. F, Sp.

490 Information Environment (3) Generation, production, management, dissemination, and use of information. Roles of information in society, information seeking and user behavior, information industry, economics of information products and services, technological and organizational change, information professions, and issues. F, Sp, Su.

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

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

504 Electronic Information and Communications Laboratory (1) Methods for creating and managing information in electronic form. Communication of electronic information in networked environment. Location and use of electronic information resources. For GSLIS graduate students only; must be completed satisfactorily in first semester. S/N only. F, Sp.

520 Information Content Representation (3) Principles of distinguishing, describing, and indexing intellectual works; current approaches; citation systems, descriptive cataloging, non-subject indexing, pre- and post-subject subject indexing, classification, and categorization; authority control of index terms; standards. F, Sp, Su, A.

521 Cataloging and Classification (3) Basic library-oriented cataloging and classification techniques, tools, and supporting operations. Descriptive cataloging, choice and form of non-subject entries, subject heading work, general classification, authority control, bibliographic utilities, online library catalogs. F, Sp, Su, A.

522 Advanced Cataloging and Classification (3) Cata

523 Abstracting and Indexing (3) Philosophies, standards, and procedures for manual and automatic document indexing, back-of-the-book indexing, vocabulary control, thesaurus construction, and abstracting.

530 Information Access and Retrieval (3) Media for information storage, logical and physical information structures, query logic and languages, search strategies and heuristics, user interfaces, evaluation of retrieval system performance. Search techniques for various types of databases including multi-media, full-text, numeric, bibliographic, F, Sp, Su, A.

531 Sources and Services for the Social Sciences (3) Information sources in political science, sociology, psychology, geography, history, anthropology, business, and education. F

532 Sources and Services for Science and Engineering (3) Information sources in engineering, physical, and life sciences. Sp.

533 Sources and Services for the Humanities (3) Information sources in philosophy, religion, fine arts, performing arts, literature and language. Organization and management of regional collections. F

534 Government Information Sources (3) Selection, acquisition, organization, and utilization of government information in variety of formats from legislative, judicial and executive branches of federal, state, local, and international government and intergovernmental agencies. Sp.

535 Advanced Information Retrieval (3) Bibliographic, non-bibliographic, full-text databases, e.g., non-bibliographic formula and structure databases, counts-page/full-text retrieval, document delivery alternatives, evaluation, and testing. Sp.

536 Creation and Distribution of Information and Knowledge Resources (3) Historical, political, and societal dimensions of creation, dissemination, growth, and institutionalization of information and knowledge from Aristotle’s Lyceum to twentieth-century university and research environments.

537 Information Industry (3) Issues and trends concerning information industry: products and services. Standardizing technical standards, choice of distribution media, entrepreneurial opportunities. Legal, ethical, and quality concerns. F

538 Economics of Information (3) Costing and pricing of information; value of information and value added services; cost-benefit analysis and tradeoffs. Policy issues related to economic aspects of information exchange and transfer. F

539 Information Policy (3) Role of government in creation and exchange of information; review of national and international policy areas relevant to information creation, production, and distribution; development of information policy for organizations. Sp

540 Research Methods (3) Research methods in variety of information environments; primary and secondary research; research project design; research results interpretation; analysis of published research; techniques supporting research process. E

550 Management of Information Organizations (3) Supervisory and management; strategies, and techniques applicable to information professional work in libraries, archives, records management, and other information organizations. F

551 School Library Media Centers (3) Planning, implementation, evaluation of school library programs. Current involvement, role of technology, site-based management, relationships with district and state services. F

552 Information Centers in Higher Education (3) Development, mission, trends, issues, users, services, and environment of campus information centers including libraries and alternatives; learning resources center and library-computer center models. F

553 Specialized Information Agencies (3) Development and present status, scope and objectives. Administration of organizational problems and techniques. F

554 Public Library Management and Services (3) Development, roles, political environment, governance, organization, fiscal management, services, marketing, and performance evaluations. Sp

555 Scientific and Technical Communications (3) Evolution of scientific and technical communication; current trends; role of formal and informal communications; major STI organizations and their roles. F

557 User Instruction (3) Theory, strategy, design, and practice in providing instructional services and technology for users of information and communication systems. Includes practical experience. F

560 Information Resources Selection, Acquisition, and Evaluation (3) Principles of development and management of collections in information agencies; community analysis; users and uses; policies and proce-
daries; evaluation of items and collections; selecting items to meet particular needs. F, Sp, Su, A

561 Contemporary Book Publishing (3) Creation, design, production, marketing, and distribution; various types of publishers. Sp

562 Serials (3) Serials collections; selection, acquisition, storage, preservation, use, and public services. Su, A

563 Graphic Design and Media (3) Principles and practice in visual aspects of communications. Graphic design, typography, production techniques and publication design, as these apply to electronic information delivery systems.

564 Corporate Information Systems (3) Objectives and functional elements of records systems, archival programs, management information systems and technologies within various types of organizations. Sp


566 Environmental Scanning for Information Professionals (3) Principles and practice of environmental scanning; information evaluation and synthesis; role of strategic information in modern organization.

567 Information Network Applications (3) Scholarly and community-based electronic communications. National and international standards, tools, resources; identification, analysis, evaluation, and management of tools and resources; construction of local technologies as developed and applicable.

569 Advanced Production of Audiovisual Software (3) (Same as Education in the Sciences, Mathematics, Research and Technology 569). F, Sp


572 Resources for Young Adults (3) Critical survey of books and related materials for young adults: personal, vocational, and recreational needs and interests. Evaluation, selection, and utilization for school and public libraries. Su

573 Programming for Children and Young Adults (3) Philosophy and objectives of public and school library services for children and young adults. Reading, listening, and viewing guidance for individuals and groups, Program planning, implementation, and evaluation. Prereq: 571 or 572. Su

574 Adult Materials and Services (3) Popular informational and recreational materials and services to meet adult interests in variety of formats. Development of specialized collections.

580 Foundations of Information Sciences and Technologies (3) Definitions of information, information science, and information technology; theories of information, information representation, retrieval, and transfer; standards and technologies for information processing and distribution; reference front; bibliometrics and information science; relationships with other disciplines. F, Sp, Su, A

582 Library Automation (3) Computer-based applications and systems for libraries including OCLC, bibliographic utilities, retrospective conversion, circulation systems, online catalogs, computer-based reference services, acquisitions and serials control, systems planning and implementation. F

583 Information Systems (3) Systems concept, designing, analysis, and design of information systems. Selecting and using information systems to support various activities. User involvement in the development process. F, Sp

584 Database Management Systems (3) Defining data needs, data structures, role of operating systems in data management, file organization, database management systems, logical data models, internal data models, database administration and evaluation. Design and implementation of application using database management system. Sp

585 Information Technologies (3) Evolution, trends, capabilities, and limitations of technologies applied to information capture, storage, preservation, access, and distribution. F, Sp

586 Information Retrieval Systems (3) Historical perspective on information retrieval research; statistical and probabilistic retrieval techniques; techniques for modeling expert intermediary systems; modeling of retrieval systems. F

587 Information System Design Project (3) Supervised and structured experience in design and development of computer-based information systems. Prereq: 583, 584 or 586, 588, and 589. F, Sp

588 Psychology of Human-Computer Interaction (3) Survey of human-computer interaction and introduction to psychological and other behavioral sciences knowledge and techniques useful in design of computer systems for human use. Basic psychological phenomena of human cognition, memory, problem solving, and language and how these processes relate to and condition interaction between humans and interactive computing systems. Sp

589 Information Networking Technologies (3) Conception and terminology of information transmission. Information network architecture and standards. Contemporary and emerging information networking technologies. F

590 Problems in Information Sciences (3-6) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

591 Supervised Readings in Information Sciences (3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. F, Sp

592 Seminar in Information Sciences (3-6) Prereq: Consent of instructor. May be repeated with consent of advisor. Maximum 6 hrs. F, Sp

593 Independent Study (3-6) Prerequisite: Consent of advisor. Maximum 6 hrs. F, Sp

594 Graduate Research Participation (3) Advanced research techniques under supervision of staff research director whose area coincides with interests of student. Prereq: Consent of advisor and research director. SNC only. F, Sp

599 Practicum (3-6) Opportunity to translate theory into practice under guidance of qualified information professional. Prereq: Completion of core and pertinent advanced courses relevant to student's practicum design. Minimum 3.0 cumulative GPA. Written consent of advisor and approval of practicum coordinator. May be repeated. Maximum 6 hours. E

601 Advanced Seminar in Information Sciences (3) Theories, research, and practical traditions of information representation, organization, and access and retrieval. Research opportunities and methods. Relationship to and interaction with other disciplines.

Interdisciplinary Programs

(College of Arts and Sciences)

The College of Arts and Sciences offers a series of interdisciplinary undergraduate majors and minors through its Interdisciplinary Programs. These programs include African and African-American Studies, American Studies, Ancient Mediterranean Civilizations, Asian Studies, Cinema Studies, Comparative Literature, Latin American Studies, Linguistics, Medieval Studies, Russian and East European Studies, Urban Studies, and Women's Studies.

African and African-American Studies

GRADUATE COURSES


542 Black African Politics (3) (Same as Political Science 452.)

561 African Prehistory (3) (Same as Anthropology 481.)


483 African-American Women in American Society (3) Historical and contemporary socio-eco-political factors in American society as related to Black women. (Same as Women's Studies 483.)

510 Special Topics (3) May be repeated. Maximum 6 hrs.

American Studies

GRADUATE COURSES

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Ancient Mediterranean Civilizations

GRADUATE COURSES

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Asian Studies

GRADUATE COURSES

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Cinema Studies

GRADUATE COURSES

400 Special Topics (3) May be repeated. Maximum 6 hrs.

420 French Cinema (3) (Same as French 420.)

421 Topics in Italian Literature and Cinema (3) (Same as Italian 421.)

489 Special Topics in Film (3) (Same as English 489.)

510 Special Topics (3) May be repeated. Maximum 6 hrs.
Comparative Literature

GRADUATE COURSES

401-02 Special Topics in Comparative Literature (3,3) Content varies. May be repeated. Maximum 6 hrs.

402 Latin American Studies Seminar (3) Selected topics. May be repeated. Maximum 6 hrs.

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Latin American Studies

GRADUATE COURSES

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Linguistics

GRADUATE COURSES

400 Topics in Linguistics (3) Content varies. May be repeated. Maximum 6 hrs.

411 Linguistic Anthropology (3) (Same as Anthropology 411.)

420 The Development of Historical Linguistics as a Science (3) Scientific understanding of language change. Emergence of Neogrammarians from 19th-century intellectual trends. Impact of synchronic, descriptive, and transformational-generative linguistics on contemporary diachronic theory. Prereq: 6 hrs of courses required for linguistics concentration or consent of instructor.

425 Introduction to Descriptive Linguistics (3) (Same as French 425, German 425, Russian 425, and Spanish 425.)

426 Methods of Historical Linguistics (3) (Same as German 426, French 426, Russian 426, and Spanish 426.)

429 Romance Linguistics (3) (Same as French 429 and Spanish 429.)

430 The Development of Synchronic Linguistics as a Science (3) Development of first synchronic paradigm of linguistics. Impact of synchronic, descriptive, and transformational-generative linguistics on contemporary synchronic theory. Prereq: 6 hrs of courses required for linguistics concentration or consent of instructor.

435 Structure of the German Language (3) (Same as German 435.)

436 History of the German Language (3) (Same as German 436.)

471 Sociolinguistics (3) (Same as English 471 and Sociology 471.)

472 American English (3) (Same as English 472.)

474 Teaching English as a Second or Foreign Language I (3) (Same as English 474.)

475 Teaching English as a Second or Foreign Language II (3) (Same as English 475.)

476 Second Language Acquisition (3) (Same as English 476.)

485 Special Topics in Language (3) (Same as English 485.)

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Medieval Studies

GRADUATE COURSES

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Russian and East European Studies

GRADUATE COURSES

401-02 Advanced Grammar, Conversation, and Composition (3,3) Prereq: Russian Composition and conversation or equivalent. (Same as Russian 401-02.)

451 Senior Seminar (3) For majors in Russian; minors admitted at discretion of instructor. Intensive study of language, literary style, and literary criticism based on selected major novels. (Same as Russian 451-52.)

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Urban Studies

GRADUATE COURSES

401 The City in the U.S. (3) (Same as Planning 401.)

441 Urban Geography (3) (Same as Geography 441.)

64 Urban Ecology (3) (Same as Sociology 464.)

Women's Studies

GRADUATE COURSES

400 Topics in Women's Studies (3) Content varies. May be repeated. Maximum 6 hrs.

422 Women Writers in Britain (3) (Same as English 422.)

425 Women's Health (3) (Same as Health 425.)

434 Psychology of Gender (3) (Same as Psychology 434.)

466 Rhetoric of the Woman's Rights Movement to 1930 (3) (Same as Speech Communication 466.)

476 Rhetoric of the Contemporary Feminist Movement (3) (Same as Speech Communication 476.)

483 African-American Women in American Society (3) (Same as African-American Studies 483.)

510 Special Topics (3) May be repeated. Maximum 6 hrs.

Journalism

(College of Communications)

MAJOR

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

James A. Crook, Director

Professors:

Adamson, June N. (Emeritus), M.S., Tennessee

Ashdown, Paul G., Ph.D. ................. Bowling Green

Bowles, Dorothy, Ph.D. ................. Wisconsin

Cade, Dozier C. (Emeritus), Ph.D. ........ Iowa

Caudill, C. Edward, Ph.D. ............. North Carolina

Crock, James A., Ph.D. ................. Iowa State

Everett, George A. (Emeritus), Ph.D. .... Iowa

Griffiths, José-Marie (Adjunct), Ph.D. .... London (UK)

Haskins, Jack B. (Emeritus), Ph.D. .... Minnesota

Lain, John L. (Emeritus), M.A. .......... Iowa

Leiter, B. Kelly (Emeritus), Ph.D. ...... Southern Illinois

Littmann, Mark (Chair of Excellence), Ph.D. .......... Northwestern

Miller, M. Mark, Ph.D. .......... Michigan State

Singles, Michael W., Ph.D. .......... Northern Illinois

Teeter, Dwight L., Jr., Ph.D. .......... Wisconsin

Tenopir, Carol (Adjunct), Ph.D. .......... Illinois

Tucker, Willis C. (Emeritus), M.S. .......... Kentucky

Associate Professors:

Heller, Robert B., M.A. .......... Syracuse

Lucarelli, Susan M., Ph.D. .......... Tennessee

Morrow, Jerry L., Ph.D. .......... Toledo

Assistant Professors:

Foley, Daniel, M.S. .......... Northwestern

White, Candace L., Ph.D. .......... Georgia

The School of Journalism offers a concentration area for the master's with a major in Communications and participates in the interdisciplinary doctoral program. See Communications for additional information.

Journalism

GRADUATE COURSES

403 International Communications (3) Development and operations of world mass communications channels and agencies. Comparative analysis of media, media practices, and flow of news throughout world. Print and broadcast systems in terms of social, political, economic, and cultural factors. Relation of communication practices to international affairs and understanding. Prereq: 6 hrs of mathematics and/or accounting and senior standing.

412 Opinion Writing (3) Analysis of editorial positions, practices, and pages. Writing of editorials and columns for newspapers, magazines, and company publications. Study and use of rhetorical devices and logic. Prereq: Writing Mass Communication or consent of instructor. (Same as Public Relations 412.)

414 Magazine Article Writing (3) Techniques of writing in-depth articles of mass circulation and specialized magazines. Organizing and presenting material, problems in specialized areas: business, science, agriculture, humanities. Prereq: Communications 200, or consent of instructor.


420 Print Media Management (3) Current business practices among print news media, especially newspapers. Problems in management and production and outreach for new technologies. Prereq: 6 hrs of mathematics and/or accounting and senior standing.

430 Public Affairs Reporting (3) Reporting and writing about courts, governments, and public agencies. Event and issue-oriented journalism of politics and public affairs. Prereq: 560, E.

433 Advanced Editing (3) Sensitive to language and editing skills. Headline writing, layout, and production. Prereq: 203.

444 Journalism as Literature (3) Study of writers from 17th century to modern era whose works have endured as both journalism and literature. Emerging genres called literary journalism: means of cultural reporting with personal narrative style. Prereq: Consent of instructor.

450 Writing About Science, Technology, and Medicine (3) Writing workshop to analyze examples of succ-
cussful science writing and write series of articles for general public based on scientific journals, news conferences, technical meetings, and interviews. Prereq: Consent of instructor. (Same as Information Sciences 450.) F, Sp

451 Environmental Reporting (3) Writing for news media on such environmental issues as strip-mining, water pollution, air pollution, sludge, nuclear power, fossil fuel, and solid wastes. Presentations from and interviews of experts in environmental science and reporting. Exemplary popular literature in environmental reporting. Prereq: Editing for majors; consent of instructor for non-majors.

455 Issues in Science Communications (3) Topics vary. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

456 Science Writing as Literature (3) Survey of important science writing for general public across spectrum of science, engineering, and medicine. Works by authors such as Arthur C. Clarke, Stephen J. Gould, and RichardSzelzer. Analysis of literary qualities in quest to understand why some science writing succeeds. Prereq: Consent of instructor.

460 Mass Communications History (3) Development of press and role of mass communications in American history. Newspapers, radio, television, and magazines. F

480 Journalism in the High School (3) Functions and methods of high school publications. Problems related to staff selection, content of publications, copy, layout, photography, printing, advertising, and business. Planning course outlines and curricula for journalism/mass media studies. Su

490 Advanced Photojournalism (3) Advanced principles and methods of black-and-white photography. Introduction to color photography. News and feature photographs and photo essays. Prereq: 290 or consent of instructor. Sp


525 Public Opinion (2) Role of press in developing and influencing public consensus. Social theories of public opinion and analysis of mass media's response. (Same as Public Relations 525.)

535 Publications Management (3) Problems in management, production, market analysis and design. Techniques of writing, editing, and presenting comprehensive articles and other material. Regional and specialized magazines, individual editorial projects. Prereq: 420 or consent of instructor.

550 Writing and Editing Projects (3) Specialized writing or editing interests: agriculture, politics, labor, finance, science, technical, general publications. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

580 Seminar in Visual Communication (3) Behavioral aspects of communication with images. Theories of psychological effect in color, shape, texture, and other design elements. Prereq: 203 or Advertising 350 or Broadcasting 430 or equivalent.

590 Communications and International Development (3) Relationship between mass communications and development of nations. Role of communications media of developed nations in "Third World" regions of globe. Communications as facilitator of international cooperation.

597 Independent Study (3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

598 Internship (3) Professional work in journalism supervised by editor or manager with faculty approval. No retroactive credit for previous work experience. Prereq: Completion of core curriculum.

Public Relations

GRADUATE COURSES

412 Opinion Writing (3) (Same as Journalism 412.)

416 Issues in Public Relations (3) Topics vary. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

470 Public Relations Campaigns (3) Research, planning, and comprehension and evaluation of major public relations campaigns. Prereq: Writing for majors; consent of instructor for non-majors.

516 Seminar in Public Relations Issues (3) Topics vary. May be repeated. Maximum of 6 hrs.

526 Public Opinion (3) (Same as Journalism 526.)

571 Public Relations Management (3) Analysis and management of problems in communication between institutions and organizations and their publics. Evaluation techniques. Required for certification in modern language arts and Latin. Prereq: Completion or near completion of foreign language hours for certification and admission to Teacher Education Program.

590 Special Topics in Art Education (3-4) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

Language, Communication, and Humanities Education

GRADUATE COURSES

505 Teaching of Foreign Languages, Grades 7-12 (3) Instructional methods, lesson planning, peer-teaching, materials for teaching foreign language and culture; evaluation techniques. Required for certification in modern language arts and Latin. Prereq: Completion or near completion of foreign language hours for certification and admission to Teacher Education Program.

555 Teaching English in the Secondary School (3) Techniques of teaching composition, language, and literature. Prereq: Admission to Teacher Education Program.

470410 Teaching and Reading in the Secondary School (3) Approaches for teaching basic reading skills and ways of teaching literature. Sp

461 Developing Reading Skills in Content Fields (3) Techniques for teaching reading and study skills in content areas of school program. Extensive assessment of textbook, Middle school and high school. E

500 Thesis (1-15) Prerequisite: May be repeated. Maximum 6 hrs. S/NC only. E


507 Teaching Poetry Grades 7-12 (3) Research and theory in application to teaching of poetry. Design of strategies and materials for teaching and reading of poetry. Review of texts and materials. Sp

508 Teaching Composition in the Secondary School (3) Teaching narrative, description, exposition, and argumentation: writing process and marking of student papers. Sp

509 Teaching Fiction in the Secondary School (3) Teaching of novels and short stories. F

515 Seminar (1-3) Curriculum, instructional technology, elementary education, secondary education, or social foundations as related to goals of students' programs. May be repeated. Maximum 6 hrs. S/NC only. E

516 Seminar (1-3) Curriculum, instructional technology, elementary education, secondary education, or social foundations as related to goals of students' programs. May be repeated. Maximum 6 hrs. S/NC only. E

518 Educational Specialist Research and Thesis (3) May be repeated. Prerequisite: P/NC only. E

Art Education

GRADUATE COURSES

510 History and Philosophy of Art Education (3) United States from 1860's to present. Prereq: Consent of instructor.

520 Studies in Art Education (3) Issues and topics current to the field of art education. Prereq: Consent of instructor.

530 Production and Critical Analysis of Art (3) Relationship of production and critical analysis of works of art to discipline-based art education.

540 Instructional Materials and Production Related to the Teaching of Art (3) Development and use of instructional aids concerned with all aspects of teaching art: videotapes, audiotapes, slides, charts, and learning packs.

590 Special Topics in Art Education (3-4) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.
Large Animal Clinical Sciences

See College of Veterinary Medicine and Comparative and Experimental Medicine

Law

(College of Law)

MAJOR DEGREES

Law .................. J.D., J.D.-MBA, J.D.-M.P.A.

Richard S. Wirtz, Dean

Professors:

Best, Reba, M.L.S. .................................... Florida
Blaze, Douglas A., J.D. .......................... Georgetown
Cohen, Neil P., LL.M. .................. Harvard
Cook, Joseph G., LL.M. ........................ Yale
Hardin, Patrick, J.D. ........................... Chicago
Hess, Amy M., J.D. ............................... Virginia
Jones, Darward S. (Emeritus), J.D. .... North Carolina
King, Joseph H., J.D. ............................ Pennsylvania
Lacey, Forrest W. (Emeritus), S.J.D........ Michigan
Le Clercq, Frederic S., LL.B ................ Duke
Lloyd, Robert M., J.D. ....................... Michigan
Miller, Charles H. (Emeritus), J.D. .......... Duke
Overtor, Elvin E. (Emeritus), S.J.D........ Duke
Phillips, Jerry F., J.D. .......................... Yale
Piquet, Cheryl, M.L.S. ................. Tennessee
Rivkin, Dean H., J.D. ....................... Vanderbilt
Sewell, Tookey H. (Emeritus), LL.M ....... Vanderbilt
Sobieski, John L., J.D. .......................... Michigan
Wirtz, Richard S., J.D. .......................... Stanford

Associate Professors:

Aarons, Dwight, J.D. .......................... UCLA
Anderson, Gary L., LL.M. ...................... Harvard
Ansley, Frances Lee, LL.M. ............... Harvard
Beinental, William J., J.D. .................. Miami
Black, Jerry F., J.D. .............................. Tennessee
Bunker, Mary Garrett, J.D. .............. Washington
Burton, J. M., J.D. ............................... Kentucky
Cornett, Judy M., J.D. ............................ Tennessee
Davies, Thomas Y., J.D. ....................... Northwestern
Gray, Greyfried B., J.D. ................. Vanderbilt
Kennedy, Deserlee A., LL.M. .............. Temple
Leatherman, Don A., LL.M. ............... New York
Parker, Carol M., J.D. .......................... Michigan
Pierce, Carl A., J.D. ............................. Yale
Plank, Thomas E., J.D. ........................ Maryland
Raymond, Glenn A., J.D. ................. New York
Stark, Barbara, J.D. ............................. Georgia
Stein, Gregory M., J.D. ....................... Columbia
Wertheimer, Barry M., J.D. .............. Duke

Assistant Professors:

Browne, Kelly K., J.D. .......................... Cincinnati
Davis, Melinda D., M.L.S. ................. North Carolina
Thorpe, Steven R., J.D. ...................... Mercer

Instructors:

Hofeer, Mary Jo, J.D. .......................... Brooklyn
McAlpine, Janice E., J.D. ...................... Michigan
Moore, Jean (part-time), M.L.S. ........... Michigan
Wolf, Pamela L., M.S.S.W. ............... Tennessee

The College of Law offers the Doctor of Jurisprudence degree program; a dual degree program with the College of Business Administration leading to the J.D. and the Master of Business Administration degree; and a dual degree program with the Department of Political Science, College of Arts and Sciences, leading to the J.D. and Master of Public Administration. In addition graduate students may be eligible to take a limited number of law courses to count toward a graduate degree.

Current information regarding admission, financial aid, course requirements, academic policies, extracurricular activities, and student services is available from the Admissions Office, The University of Tennessee, College of Law, 104 Aconda Court, 862 Volunteer Blvd., Knoxville, Tennessee 37996-4070. Completed application should be received before February 1 of the year of requested admission.

DEGREE OF DOCTOR OF JURISPRUDENCE

The degree of Doctor of Jurisprudence will be conferred upon candidates who complete, with the required average, six semesters of resident law study and who have 88 semester hours of credit, including all required courses. The required average in any subject must be maintained on the work of all six semesters and also for the combined work of the grading periods in which the last 28 credit hours taken in residence were earned.

Averages are computed on weighted grades. Grades are on an alphabetical scale from A+ to F. No credit toward the J.D. degree is awarded for grades of D- or F.

Eligible law students may receive up to six (6) semester hours of credit toward the J.D. degree for acceptable performance in upper-level courses that materially contribute to the study of law and which are taken in other departments at The University of Tennessee. Course selection and registration are subject to guidelines approved by the faculty which include the requirement that any such course be acceptable for credit toward a graduate degree in the department offering the course.

Refer to the Law Catalog and Student Handbook for current degree requirements.

Concentration in Business Transactions

Students interested in a concentration in business transactions must complete all of the following law courses:

818 Fundamental Concepts of Income Taxation
826 Introduction to Business Transactions
827 Business Associations
972 Income Taxation of Business Organizations
940 Land Finance Law
840 Commercial Law
842 Contract Drafting Seminar
833 Representing Enterprises

None of the above courses may be taken on an S/NC basis (with the exception of 826).

*This course is not required for students who have an undergraduate major in accounting, finance, or business administration, who hold the MBA degree, or who are enrolled in the dual J.D.-MBA program. Waivers may also be granted to students who have acquired the required business knowledge through other coursework or through practical experience.

DUAL J.D.-MBA DEGREE PROGRAM

The College of Business Administration and the College of Law offer a coordinated dual
degree program leading to the conferral of both the Doctor of Jurisprudence and the Master of Business Administration degrees. A student pursuing the dual program is required to take fewer hours of coursework than would be required if the two degrees were to be earned separately.

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 commence studies in the dual program at the beginning of any term subsequently to matriculation in both colleges provided, however, that dual program students must be started prior to entry into the last 28 hours required for the J.D. degree and the last 16 hours required for the MBA degree.

Curriculum

A dual degree candidate must satisfy the graduation requirements of each college. Dual degree students withdrawing from the dual degree program before completion of both degrees will not receive credit toward graduation from either college for courses in the other college, except as such courses qualify for credit without regard to the dual degree program. For students continuing in the dual degree program, the J.D. and MBA degrees will be awarded upon completion of requirements of the dual degree program.

The College of Law will award a maximum of nine (9) semester hours toward the J.D. degree for acceptable performance in approved graduate-level courses offered by the College of Business Administration. Three of the 9 semester hours must be earned in Accounting 501, 503, or a more advanced accounting course.

The College of Business Administration will award credit toward the MBA for acceptable performance in a maximum of 9 semester hours of approved courses offered by the College of Law.

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 year.

Awarding of Grades

For grade recording purposes in the College of Law and the Department of Political Science, grades awarded in courses in the other unit will be converted to either Satisfactory or No Credit and will not be computed in determining a student's GPA or class standing. The College of Law will award a grade of Satisfactory for an approved course which the student earns a B grade or higher and a No Credit for any lower grade. The Political Science Department will award a grade of Satisfactory for an approved law course in which the student earns a grade of C+ or higher and a grade of No Credit for any lower grade. The official academic record of the student maintained by the Registrar of the University shall show the actual grade assigned by the instructor without conversion.

Non-Law Elective Course Credit

Students enrolled in the J.D.-MBA degree program may not receive credit toward the J.D. degree for courses taken in other departments of the University except for those taken in conjunction with the dual program.

Note: Students are advised to consult The Graduate School’s degree requirements as stated in the front section of this catalog as well as the requirements for this college.

DUAL J.D.-M.P.A. PROGRAM

The College of Law and the Department of Political Science in the College of Arts and Sciences offer a coordinated dual degree program leading to the conferral of both the Doctor of Jurisprudence and Master of Public Administration degrees. In this program, a student may earn the M.P.A. and J.D. degrees in about four years rather than the five years that otherwise would be required. Students pursuing the dual degree program should plan to be enrolled in coursework or an internship for one summer term in addition to taking normal course loads for four academic years.

Admission

Applicants for the J.D.-M.P.A. program must make separate application to, and be independently accepted by, the College of Law for the J.D. degree and the Department of Political Science and the Graduate School for the M.P.A. degree. Applicants must also be accepted by the Dual Degree Committee. All applicants must submit a Law School Admission Test (LSAT) score. An applicant's LSAT score may be substituted for the Graduate Record Examination (GRE) score, which is normally required for admission to the M.P.A. program. Application may be made prior to or after matriculation in either the J.D. or the M.P.A. program, but application to the dual program must be made prior to entry into the last 29 semester hours required for the J.D. degree and prior to entry into the last 15 hours required for the M.P.A. degree.

Curriculum

A dual degree candidate must satisfy the requirements for both the J.D. and the M.P.A. degrees, as well as the requirements for the dual program. The College of Law will award a maximum of 9 semester hours of credit toward the J.D. degree for successful completion of approved graduate level courses (500 or 600 level) offered in the Department of Political Science. The M.P.A. program will award a maximum of 9 semester hours of credit toward the M.P.A. degree for successful completion of approved courses offered in the College of Law. All courses for which such cross-credit is awarded must be approved by the J.D. M.P.A. coordinators in the College of Law and the Department of Political Science. All candidates for the dual degree must successfully complete Administrative Law (Law 821) and are encouraged to take Local Government (Law 824). An internship is strongly recommended for students in the dual degree program, as it is for all M.P.A. candidates, but an internship is not required.

During the first two years in the dual program, students will spend one academic year completing the required first year of the College of Law curriculum and one academic year taking courses solely in the M.P.A. program. During those first two years, students may not take courses in the opposite area without the approval of the J.D.-M.P.A. coordinators in both academic units. In the third and fourth years, students are encouraged to take both law and public administration courses each semester.

Dual degree students who withdraw from the program before completion of the requirements for both degrees will not receive credit toward either the J.D. or the M.P.A. degree for courses taken in the other program except as such courses qualify for credit without regard to the dual program.

Awards of Grades

For grade recording purposes in the College of Law and the Department of Political Science, grades awarded in courses in the other unit will be converted to either Satisfactory or No Credit and will not be computed in determining a student's GPA or class standing. The College of Law will award a grade of Satisfactory for an approved M.P.A. course which the student earns a grade of B or higher and a grade of No Credit for any lower grade. The Political Science Department will award a grade of Satisfactory for an approved law course in which the student earns a grade of C+ or higher and a grade of No Credit for any lower grade. The official academic record of the student maintained by the Registrar of the University shall show the actual grade assigned by the instructor without conversion.

POLICY FOR GRADUATE STUDENTS TAKING LAW COURSES

Students pursuing a graduate degree in another college may, upon approval of the College of Law and the major chairperson, take up to 6 semester hours of law courses and receive credit toward the graduate degree. The graduate student must register for the law course during regular registration at the College of Law requesting an S/NC grade only. If a C or above is earned in a law course, an S will be recorded on the transcript. If a student earns a grade below a C, a 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 average. Law courses may be taken for credit only by students enrolled in a graduate degree program.

Different rules apply to the student enrolled in the Dual J.D.-MBA or J.D.-M.P.A. Programs. Grades must be earned according to the grading system of the respective college, e.g., numerical grades for law courses, letter grades for graduate courses. Refer to section on Grades for the grading scale acceptable toward meeting degree requirements. Cumulative GPA for law courses only will be carried until graduation, at which time both the graduate and the law cumulative will be shown on the permanent record.

PROFESSIONAL COURSES

801 Civil Procedure I (3) Finding effect of judgments, selecting proper court (jurisdiction and venue), ascertaining applicable law, and federal and state practice.


803 Contracts I (3) Basic agreement process and legal protections afforded contracts: offer and acceptance, consideration and other bases for enforcing promises;
Survey of time value of money and related economic principles of income taxation (3)

814 Legal Profession (3) Legal, professional and ethical standards; methodology, and aspects of law of obligations and remedies. Prerequisite: completion of all courses for concentration in business transactions.

828 Corporate Finance (3) Legal issues arising in conjunction with corporate financial transactions: issuance of debt and various types of equity securities, distributions to shareholders, mergers and other corporate acquisitions. Legal valuation of corporate securities.

833 Antitrust (3) Federal antitrust laws; monopolization, price-fixing, group boycotts, and anti-competitive practices generally; government enforcement techniques and private treble damage suits.

840 Commercial Law (4) Basic coverage of most significant concepts of the Uniform Commercial Code: security interests in personal property (Art. 9 of U.C.C. and relevant Bankruptcy Code provisions); commercial paper, including checks, negotiable instruments (Arts. 3 and 4 of U.C.C.); sales of goods, including coverage of portions of Article 2 of U.C.C. not covered in Contracts.

841 Commercial Finance Seminar (2) Practical experience in large and medium transactions. Planning of financing transactions and negotiating and drafting contracts. Financing techniques: equipment leasing and matched fund lending, current issues in commercial financing, and other important issues not normally covered in Commercial Law. Prerequisite: 840.

842 Contract Drafting Seminar (2) Practical fundamentals of drafting contracts of different types.

843 Debtor-Creditor Law (3) Basic elements of federal bankruptcy law: claims, property of estate, automatic stay, preference, avoidance, valuation, reaffirmation, reclamation, repudiation of contracts, priority of distributions, and distinction between liquidation and rehabilitation. Enforcing judgments outside of bankruptcy.

846 Constitutional Law II (3) First Amendment rights of religion, expression, association and press; Fourteenth Amendment rights against discrimination as to race, sex, etc.; rights to franchise and apprenticeship; substantive due process and procedurally oriented due process; civil rights under federal laws enforcing post-Civil War Amendments to Constitution.

848 Civil Rights Actions (3) Litigation to vindicate constitutional rights in private actions against the government and its officials, as well as rights protected by other civil rights legislation; elements of cause of action under 42 U.S.C. § 1983; actions against federal government officers under the Bivens doctrine; institutional and individual immunity; relationship between state and federal courts in civil rights actions; and remedies for violations of constitutional and other civil rights.

854 Criminal Procedure I (3) Police practices and constitutional rights of persons charged with crimes; arrest, search and seizure; identification; interrogation and confession; electronic eavesdropping, and right to counsel.

855 Criminal Procedure II (3) Pre- and post-trial procedures in a criminal case: bail; preliminary hearing; grand jury, indictment or information; discovery; jury trial; plea bargaining; jury trial; double jeopardy; and post-conviction relief. Federal Rules of Criminal Procedure.

859 Criminal Law Seminar (2) Advanced problems in criminal law and administration of justice. Prerequisite: 809.

866 Environmental Law and Policy (3) Study, through methods of public policy analysis, of responses of legal systems to environmental problems; environmental litigation; Clean Air Act; Clean Water Act; National Environmental Policy Act; and selected regulatory issues.

879 Law and Economics (3) Relationship between legal and economic thought; application of basic economic concepts to legal problems; economics in legal decisionmaking; scholarly support for and criticism of economic analysis of law. Designed for students with no undergraduate background in economics or mathematics.

889 International Law (3) International law; international legal institutions; international agreements and jurisdiction; international organization; international trade; and international disputes.

891 Comparative Law (3) Introduction to civil law systems in Europe and Germany, focusing on legal institutions, methodology, and aspects of law of obligations and commercial law.

895 Labor Relations Law (3) Political, social and economic influences in development of federal labor relations law; collective bargaining; grievance arbitration.
929 Teaching Clients the Law (3) Communication of legal issues to clients who are persons other than lawyers. Development of written and oral communication skills by teaching and researching papers that synthesize Tennessee or federal law in plain language.

935 Gratuity Transfers (4) Nature, creation, termination, and modification of trusts; theory of taxation administration; interstate succession; execution, revocation, probate and contest of wills; creation and construction of various types of future interests; the applicable law and its limitations; application of the rule against perpetuities.

937 Estate Planning Seminar (2) Estate planning partnerships: relationship to estate planning and practice of fiduciary administration, insurance, property, wills, future interests, trusts and parties in partnerships. Required reading of estate plans and implementing documents.

940 Land Finance Law (3) Financing of buildings, deeds of trust and land contracts, processes of priorities; transfer of secured interests when debt assumed or taken subject to security interest; default, exercise of equity of redemption and statutory right of redemption; mechanics' and materialmen's liens; contemporary developments in areas as condominiums, cooperatives, housing subdivisions, and shopping centers.

941 Land Acquisition and Development Seminar (2) Simulated representation of various parties: sellers, buyers, construction lenders, permanent lenders, architects, contractors, and developers, in development of real estate project. Negotiation and drafting of agreements essential in large commercial development.

943 Use Land Law (3) Private land use controls; nuisance, easements, real covenants; equitable servitude and home owner associations; public land use controls; zoning, subdivision controls, eminent domain, and regulatory takings.

940 Computers and Law (3) Impact of computers on law and the legal profession; roles of attorneys and clients in using computer systems; required skills in building computer systems; common law office uses of computers; and computerized research. Preparation of lawyers to think effectively concerning use of computers. Prior computer experience not necessary.

945 Entrepreneur Law (3) Role of law and lawyer in entertainment industry. Course covers various music, music industry; music copyright; artists/manager relationships; recording contracts; industry labor unions; and performing rights organizations.

957 Law, Science and Technology (3) Legal implications of advanced technologies; adoption of law to challenges posed by new kinds of knowledge and new ways of doing things. Explanation of scientific research, space law, legal issues relating to new information technologies, nanotechnologies, and others designated by instructor.

959 Women and The Law (3) Treatment and status of women in American legal system; women as political actors, as family members, as participants in workplace, as targets of violence and as members of legal profession; introduction to current and competing approaches to gender justice.

959 Intellectual Property (3) Intellectual property and related interests under federal and state law: patents, trademarks, trade secrets; copyright; right of publicity; unfair competition.

962 Law and Medicine Seminar (2) Effects of legal rules on delivery and financing of medical care; nature of physician-patient relationship; unauthorized practice of medicine; medical education, licensing and specialization; health care, fiscal plans; medical malpractice liability; standard of care, proof, causation, defenses, and damages; protection of patient autonomy; consent, informed consent, conception and abortion, choice of treatment, and organ donation and organ transplantation.

970 Income Tax II (3) Corporate reorganizations and transactions; distributions among corporations and shareholders.

972 Income Taxation of Business Organizations (3) Survey and comparative analysis of federal patterns of income taxation of partnerships, subchapter S corporations, and limited liability companies; introduction to transactional analysis and business planning. Required for construction of portions of partnership agreements, opinion letters, and legal memoranda. Prereq: 816.

973 Wealth Transfer Taxation (3) Taxation of gratuitous transfers of wealth during life (gift tax) and at death (estate and generation skipping transfers). Prereq or coreq: 935.

975 Tax Theory (3) Method and purposes of government revenue collection through examination of economic and political theory; comparative analysis of various approaches and proposed policies of taxation: income tax, consumption tax, sales tax, and value-added tax. Required preparation of a research paper on a tax theory chosen by the student. Limited enrollment.


980 Insurance (3) Types of insurance: life, property, health, accident and liability insurance; regulation of insurance industry; interpretation of insurance contracts; insurance regulatory requirements; liabilities and rights of insurers and insureds; tort and property-related remedies.

985 Social Legislation (3) Systems other than traditional tort remedies for compensating victims of work-related accidents and diseases, and for compensating disabled persons. Worker's compensation requirements for covered employer-employee relationships; accidental injuries or occupational diseases arising out of and in course of employment; causation; nature of medical disability; and death benefits; exclusiveness of compensation remedy against employer and co-employees, and rights and liabilities of non-employees; administration and procedural aspects of Workers' Compensation practice; and various labor law reform measures. Brief introduction to and sampling of cases involving Social Security disability claims.

990 Issues in the Law (3) Selected topics. May be repeated.

991 Issues in the Law Seminar (2) Selected topics. May be repeated.

993 Directed Research (1-2) Independent research in law or another field under the supervision of a faculty member. Proposals must be approved by supervising faculty member and by the Dean or the Dean's designee. Maximum of once each semester during last two years of study. Prereq: Second-year standing.

994 Independent Study (1-4) Independent study under the supervision of a faculty member. Proposals must be approved by supervising faculty member and by the Dean or the Dean's designee. Maximum of once each semester during last three semesters of study.

995 Law Review (1) Completion of a potentially publishable casenote, comment, or other article for the Tennes-see Law Review. May be repeated. (Will not count toward total number of elective upper division courses taken S/NC.)

997 Moot Court (1) Participation as member of faculty supervised interscholastic moot court competition. May be repeated S/NC only. (Will not count toward total number of elective upper division courses taken S/NC.)

998 Planning and Drafting Project (1) Preparation and completion of planning and drafting project under faculty supervision in conjunction with substantive courses where such planning and drafting option is provided by course instructor. May be repeated.
Leadership Studies in Education
(College of Education)

MAJORS

College Student Personnel ........................................... M.S.
Education ............................................................. Ph.D.
Leadership Studies in Education ..................................... M.S., Ed.S., Ed.D.

Grady Bogue, Leader

Professors:
Bogue, Grady (Liaison), Ed.D. ....................... Memphis State
Harris, G. W., Jr., Ph.D. ......................... Michigan
Mertz, Norma T., Ed.D. ......................... Columbia
Ubben, Gerald C., Ph.D. ...................... Minnesota

Associate Professors:
Connelly, Mary Jane, Ed.D. ....................... VPI
Husen, Peter M., Ed.D. ....................... Stanford

Assistant Professors:
Aper, Jeffrey P., Ph.D. ....................... VPI

The Leadership Studies unit offers graduate programs leading to the Master of Science with majors in Leadership Studies in Education, concentration in educational administration and supervision, and College Student Personnel; the Specialist in Education with a major in Leadership Studies in Education, concentration in educational administration and supervision; the Doctor of Education with a major in Leadership Studies in Education, concentrations in educational administration and supervision, educational administration and supervision for practicing administrators, and higher education; and the Doctor of Philosophy with a major in Education. See Education under Fields of Instruction for full description of all degree requirements.

The higher education doctoral program combines theory and practice in an innovative demonstration of scholarly study and research. A blend of classroom instruction, individualized advising, and supervised practica and internships allows students to develop a specialization in academic administration, community-junior college administration, student personnel administration, financial management, and college teaching. The concentration for practicing administrators focuses on k-12 administrators currently in the field.

For additional information, contact the unit leader.

ADMISSION REQUIREMENTS

General test of the Graduate Record Examination; writing sample if GRE verbal is below 50th percentile; leadership potential judged by activities in organizations; and rating forms or letters of recommendation. The Ed.D. applicant must also interview with all faculty members on campus or elsewhere.

Educational Administration and Supervision

GRADUATE COURSES

513 Administrative and Organizational Theory in Education (3) Introduction to theoretical administrative and organizational foundations of management and leadership of educational programs and institutions. F, Su

515 Human Relations and Communication in Administration (3) Development and use of effective interpersonal communication skills and channels, interpersonal relations, supportive work climates, personnel motivation, conflict management skills, and role of values, ethics, and professionalism. F, Su

516 Research for School Administrators (3) Descriptive, experimental, and quasi-experimental design to help students without quantitative backgrounds to read and understand technical professional literature. Introduction to inferential statistical methods, needs assessments, and evaluation procedures. Sp, Su

529 Politics of Education and Educational Environment (3) School/community relations in political context of modern, complex society. Administrator and supervisory competency: political, social, ethical, cultural, and racial environments in which schools operate. Prereq: M.S. introductory core or consent of instructor. F, Su

535 Administrative Applications of Micro Computers (3) DOS, word processing, database management, spreadsheets, and computer communications. Review and development of specific administrative applications: scheduling, attendance, student record systems, and accounting. F, Su

544 School Finance and Business Management (3) For prospective building level administrators. Financial and logical management tasks and procedures in individual school settings. F, Su

547 Educational Facility Planning (3) Concepts and skills for development, evaluation, construction, renovation, maintenance, and operations of quality educational environments and facilities. Prereq: M.S. introductory course or consent of instructor. F, Su

548 Introductory Supervision and Personnel (3) Basic supervisory and personnel concepts and related competencies: building (or micro-organizational) level; interviewing, personnel planning, collecting and maintaining employee information, supervision of instructional and non-instructional personnel, clinical supervisory activities, staff evaluation, and staff development. Prereq: Introductory M.S. core or consent of instructor. Sp, Su

553 Strategies of Educational Planning (3) Processes for improving decision-making function through use of both qualitative and quantitative planning techniques. Policy analysis, CPM, PERT, Delphi. Prereq: Introductory M.S. core or consent of instructor. F, Su

554 School Law (3) Logical arrangement of case and statutory materials for public school administrators and teachers; problems concerning law and public education. Prereq: M.S. introductory course or consent of instructor. Sp, Su

580 Internship in Educational Administration (3) Field experience in appropriate educational setting working directly with administrator. End of planned program of study. Placement by department assignment. Some on-campus classes in conjunction with 583 or 582. Prereq: 21 hrs in educational administration and supervision or consent of instructor. F

582 Educational Leadership and District-Level (3) Role of central administrative team; relationships, behaviors, concepts and competencies for developing and maintaining effective school organization. End of planned program of study. Prereq: 21 hrs in educational administration and supervision or consent of instructor. F, Su

583 Educational Leadership—Principalship (3) Knowledge, skills and competencies for principals to be effective educational leaders. Simulation materials and field-based activities. Culminating course with internships at end of planned course of study. Prereq: 21 hours in educational administration and supervision or consent of instructor. F

590 Special Topics (1-3) May be repeated. E

592 Field Problems in Educational Administration and Supervision (3) Topic to be assigned. May be repeated. S/N or letter grade. E

675 Elementary Principals Seminar (1-3) For in-service training of elementary school administrators. Development and practice of leadership, supervision, and evaluation skills of elementary school administrators. Prereq: Presently elementary school administrator or consent of instructor. May be repeated, S/N or letter grade. F, Sp

686 Middle School Principals Seminar (1-3) For in-service training of middle school administrators. Development and practice of leadership, supervision, and evaluation skills of middle school administrators. Prereq: Presently middle school administrator or consent of instructor. May be repeated, S/N or letter grade. F, Sp

694 Seminar in Educational Administration and Supervision (1) Current educational issues, problems and research. Required two consecutive semesters during doctoral residency. May be repeated. S/N or letter grade. E

695 Advanced Seminar in Administrative Theory (2) Interdisciplinary seminar: faculty, by faculty for research and scholarly value from early to current classical theoretical studies and current periodical literature in educational administration. Required of Ph.D. students in Education. Prereq: Doctoral student in Education.

610 Internship in Educational Administration (3) Opportunity for doctoral students and advanced graduate students to gain experience in performance of critical tasks of educational administration under supervision of practitioner and University representative. May be repeated at discretion of student’s committee. Maximum 12 hrs. S/N only. E

614 Statistical Methods for School Administrators (3) Descriptive and experimental research methods, parametric and non-parametric statistical techniques used in research in educational settings. F

615 Research Designs (3) Statistical methods through multi-variate techniques and applications to various research designs. Prereq: 614 or consent of instructor. Sp

616 Research Methods (3) Overview of descriptive and experimental research designs; data collection, analysis, and interpretation for survey studies and school surveys. Conduct of survey. Prereq: Basic statistics and computer skills or consent of instructor. E

629 Seminar in Politics of Education (3) Political theories and practices as they affect operation of public school systems and institutions. Interdisciplinary discussions of community power structures and special interest groups, based on literature and research from education, sociology, and political science. Field inquiry. Prereq: 529, 518 or equivalent or consent of instructor. F

644 Educational Finance and Business Management (3) Contemporary educational finance policies and their influence upon education, nation and citizens. Superintendent team concept, management of school logistical services. Prereq: 544 or consent of instructor. F, Su

646 School Personnel Administration (3) Personnel administrative functions for professional and support staff in educational organizations. Recruitment, selection, placement, personnel policies, employee wage and salary administration, fringe benefits, collective negotiations, human relations, staff development; and staff evaluation. Prereq: 546 or consent of instructor. F, Su

655 State-Federal Relations in Education (3) Interrelationships of federal, state, and local responsibilities and organizations for education. Prereq: 646. Legal, fiscal and functional aspects of educational partnership. Funding partnerships; discussion of grant proposal development processes. Sp, Su

656 Legal Foundations of Public Education (3) School law: traditional foundations as they relate to public education at state and local levels. F

658 Conflict Management (3) Social conflict and its management. Causes of interpersonal, intergroup, and organizational conflict; skills and strategies used to man-
age conflict, conflict management models associated with different sectors of human activity, and current organizational practices for managing destructive conflict. F

670 Values and Ethics in Educational Leadership (3) Examination of moral and ethical dilemmas of work of educational administrators, including moral and ethical assistance to current and prospective administrators to deal with dimensions of knowledge, reflective, and principled ways. (Same as Higher Education 670.)

680 Administration of Complex Organizations (3) Concepts and theoretical formulations to understand, analyze, evaluate, and change complex educational programs and organizations. Prereq: 513 or consent of instructor. Sp, Su

590 Special Topics (1-3) May be repeated. E

Higher Education

GRADUATE COURSES

530 Special Topics (1-3) May be repeated. E

535 Assessment of Student Learning and Experience in Higher Education (3) Outcome assessment in American higher education: origins of assessment policies, rationales for assessment policy and practice, constructs and outcomes typically assessed, methods for conducting assessment, and uses of assessment data. Philosophies, priorities, and values, recent assessment efforts in higher education.

536 Seminar on Policy Issues in Quality Assurance (3) Exploration of historic and contemporary approaches to definition and demonstration of quality in higher education and examination of contemporary policy issues related to quality assurance in colleges and universities.

542 The College Student and the Court (3) Legal precedent affecting student personnel services in public higher education. Student discipline, housing, dress, organizations, activities fees, tuition and related federal regulations.

543 American Higher Education in Transition (3) History, philosophy, purposes, functions, organizations, and programs in American higher education.

570 Introduction to Student Personnel Work in Higher Education (3) Historical, philosophical and organizational perspective. Functional areas comprising field and major issues.

572 Theory and Practice in Student Personnel Services (3) Theoretical framework of college student personnel services and practical application of theory in student services environment. Applicable administrative theory, human development theory and evaluation assessment techniques.

599 Practicum in College Student Personnel (1-6) Prereq: Consent of instructor. May be repeated. S/N only. E

619 Administration and Governance of Higher Education (3) Trends, structure and process of collegiate governance. Development of understanding of administrative theory and practice in higher education. Prereq: 543 or consent of instructor. F

630 Special Topics (1-3) May be repeated. E

640 College and University Law (3) Legal precedent affecting organizations, administration, and finances of higher education. Academic freedom, faculty termination, religion, tort liability, administrative law, academic due process and affirmative action in employment.

645 Curriculum and Instruction in Undergraduate Higher Education (3) Content and organization of institutional strategies and curricular structure in higher education.

650 Fiscal Problems in Higher Education (3) Revenue sources, appropriation process, budget procedures, cost analysis, and fiscal management in public and independent colleges and universities.

670 Values and Ethics in Educational Leadership (3) (Same as Educational Administration and Supervision 670.)

695 Practicum in Higher Education (1-6) Supervised practicum in selected areas of higher education administration. Prereq: Consent of instructor. May be repeated. S/N only. E

698 Seminar in Higher Education (3) Capstone experience for doctoral students. Examination of major philosophical concepts and policy principles distinctive to American higher education, review of significant and current policy issues and critiques, exploration of contemporary policy issues, and evaluation of recommended reforms in higher education. Travel to state, regional, and national policy agencies for higher education.

Leadership Studies

GRADUATE COURSES

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

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


518 Educational Specialist Research and Thesis (3) May be repeated. P/NP only. E

593 Independent Study (1-3) May be repeated. S/N or letter grade. E

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

606 Leadership Forum (2) Development of research, evaluation, policy analysis skills and critical analysis and evaluation of philosophical and historical perspectives of American education. Continuous enrollment for 2 years, on-campus, for students in Ed.D. alternative research program. May be repeated. Maximum 12 hrs. S/N only.

693 Independent Study (1-3) May be repeated. S/N or letter grade. E

Life Sciences

(College of Arts and Sciences)

MAJOR DEGREES

Life Sciences ................................ M.S., Ph.D.

W.F. Harris, Chair

Coordinating Council:

Schwarz, O.J., Plant Physiology and Genetics

Douglas D.K., Biotechnology

The programs leading to the M.S. and Ph.D. degrees in Life Sciences are interdepartmental and intercollegiate and are designed to augment offerings of individual departments in the following concentrations: biotechnology, (M.S. only), and plant physiology and genetics.

Students interested in these areas should contact either the Life Sciences chairperson or the director of the area of interest. Each semester when student uses University facilities and/or faculty time before degree is completed, May not be applied toward degree requirements. May be repeated. S/N only.

593 Independent Study (1-3) May be repeated. S/N or letter grade. E

ADMISSION REQUIREMENTS

1. A Bachelor's degree with a major in a biological, behavioral, or physical science.
2. GRE (general) scores.
3. Three letters of recommendation.
4. Coursework including a year of calculus (differential and integral), one year of chemistry, and a year of physics. Specific course deficiencies may be corrected during the first year.

DEGREE REQUIREMENTS

The master's degree requires a minimum of 30 semester hours of study approved by the student's committee, a thesis, and an oral examination. Within the biotechnology program only, a non-thesis M.S. option is available. Students choosing this option are expected to complete: (1) two summers' co-op experience in an appropriate industry. An evaluation by supervisor and a written report are required (526, Biotechnology Practicum Cooperative Experience, maximum 4 hrs.). (2) A written report in the form of a scientific paper in an area of specialization chosen by the student and advisor. The minimum requirements for the doctoral degree include at least 6 hours above the 600 level, 24 semester hours of course 500, a pattern of courses approved by the student's committee, a comprehensive examination, a doctoral dissertation, and a defense of dissertation. Individual programs may have additional requirements.

CONCENTRATIONS

Biology (M.S. only)

The biology program will prepare students to participate in the wide variety of opportunities presented by the use of living cells and their components for the production of useful materials. This will be achieved at the M.S. level by a prescribed course of study of the biology and biochemistry of cells and molecules; by formal study of cells and of engineering aspects of biotechnology; and by the development of special expertise in areas such as animal embryo manipulation, automated chemical synthesis of macromolecules, bioprocess engineering, bioproducts and biotransformations, liposomes, microscopy and image processing, monoclonal antibodies and hybridoma technology, plant tissue culture, recombinant DNA technology and risk assessment, and modeling. The production of a research thesis or an industrial co-op experience plus an area of specialization will also be an important part of the training experience.

Required courses are Life Sciences 509, 511, 512, 531, 532; Biochemistry and Cellular and Molecular Biology 511; Microbiology 410, Botany 451, Chemical Engineering 475; and Ecology and Evolutionary Biology 507.

Plant Physiology and Genetics

This program provides the opportunity for intensive training and research experience in areas transcending the usual boundaries of botany, biochemistry, and agricultural plant sciences. It devotes itself to seeking solutions of problems concerning the interactions of physiology and genetics in applied and fundamental aspects of plant science.

Required courses are Life Sciences 510; Botany 521, 522; Biochemistry and Cellular and Molecular Biology 511, 512; Plant and Soil Science 471 or Ecology and Evolutionary Biology 560; Plant and Soil Science 552; Microbiology 410.

GRADUATE COURSES

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

502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any year.
Management

(undergraduate)

MAJOR

Business Administration MBA, Ph.D.

Oscar Fowler, Head

Professors:
Boling, Ronald W. (Emeritus), Ph.D., Stanford
Dewhurst, H. Dudley, Ph.D., Texas
Gilbert, Kenneth C., Ph.D., Pennsylvania
Hake, David A., Ph.D., Tennessee
James, Lawrence R. (Pilot Chair of Excellence), Ph.D., Tennessee
Keally, A. H. (Emeritus), MBA, Pennsylvania
Laud, Robert T., Ph.D., Georgia
Larsen, John M., (Emeritus), Ph.D., Purdue
Miller, Alex, Ph.D., Pennsylvania
Neel, C. Warren, Ph.D., Alabama
Reese, Don (Emeritus), Ph.D., Pennsylvania
Rush, Michael C., Ph.D., Akron
Russell, Joyce E. A., Ph.D., Pennsylvania
Stahl, Michael J., Ph.D., Rensselaer
Vance, S. C. (Emeritus), W.B. Stokely Prof., Ph.D., Pennsylvania

Assistant Professors:
Wagoner, George A. (Emeritus), M.S., Indiana
Whitlock, G. H. (Emeritus), Ph.D., Distinguished Prof., Ph.D., Tennessee

Associate Professors:
Bowers, Melissa R., Ph.D., Clemson
Bowers, Oscar S., Ph.D., Georgia
Fryxell, Gerald E., Ph.D., North Carolina
Judge, William O., Ph.D., Texas
Maddox, Robert C., Ph.D., Texas
Noon, Charles E., Ph.D., Michigan
Srinivasan, M. M., Ph.D., Northwestern

MINOR IN ENVIRONMENTAL POLICY

The department participates in a program designed to give master's level graduates an opportunity to develop an interdisciplinary specialization in environmental policy. See Economics for program description.

GRADUATE COURSES

600 Thesis (1-15) P/NP only, E

502 Registration for Use of Facilities (3-15) Required only.

504 Management of Organizational Behavior (3) Integration of individual and group differences, organization theory and design, motivation, leadership, human resources planning, and decision making.

511 Organizational Theory: Integrated Structure and Behavior (3) Cases, group projects, discussion; organizational theories, organization effectiveness; contextual factors of organizations; environment, size, technology; organizational structure configurations, organization design; social influences on organization effectiveness; motivation, leadership, group behavior, interorganizational and interpersonal issues, organization change and development.

521 Personnel Administration (3) Personnel functions and human resource management. Community relations, recruitment, selection, training, performance evaluation, wage and salary administration, legal framework as it affects personnel.

522 Labor Relations and Collective Bargaining (3) American labor history, structure and philosophy of bargaining, dispute settlement, and contract administration. (Same as Economics 562.)

526-26 Industrial and Organizational Psychology (1-3) Topic in industrial and organizational psychology. Available only by special arrangement with supervising faculty member. May be repeated. Maximum 6 hrs. S/N or letter grade.

531 Management of Technology-Based Organizations (3) Role of technology and innovation in the development and implementation of strategy. Management of research and development function and coordination with other functional departments. Management of scientists and engineers.

541 Operations Management I (3) Techniques applicable to design of systems in operations function.

542 Operations Management II (3) Operations planning and control function. Application of models to real-world systems.

551 Management of New Ventures (3) Integration of various functional disciplines and their application to the general management of ventures formed both within larger corporations and independently. Preparation of a venture plan, case analysis.

567-68 Proseminar in Industrial/Organizational Psychology (3) Basic concepts, instruments, and issues required for advanced graduate study in industrial and organizational psychology. Must be taken in sequence during student's first year of study in industrial and organizational psychology program. Credit for instructor required for all non-industrial/organizational psychology program students. (Same as Psychology 517-18.)

571 International Management (3) Analysis of environmental factors affecting the multinational enterprise. Selection of international markets, foreign investment, and management of intercultural and external factors on managerial decisions.

581 Environmental Management (3) Managerial frameworks for addressing environmental issues. Pressure from environmental challenges, corporate reputation, and sustainable business performance. Cases, field projects, research papers.

593 Directed Independent Study (1-3) Topic of mutual interest. Available only by prearrangement with supervising faculty member. May be repeated. Maximum 6 hrs. S/N or letter grade.

595 Selected Topics in Current Management Issues (3) In-depth consideration of current issues. Managerial impact of emerging topics. Prereq: Consent of instructor.

599 Doctoral Research and Dissertation (3-15) P/NP only, E

601 Research Methods (3) Seminar covering broad range of issues; research process as applied to study of strategic management. Literature and examples of research. Research proposal.

610 Seminar in Advanced Organizational Theory (3) Analysis of functioning of complex organizations. Change, organizational effectiveness, and design of complex organizations.

611 Seminar in Strategic Management I (3) Analysis of concepts and research in strategic management.

612 Seminar in Strategic Management II (3) Analysis of concepts and research in strategic management.

625 Seminar in Organizational Psychology (3) In-depth analysis of current theories, concepts, and issues associated with psychology of organizational leadership and work motivation. Prereq: 571, 585, consent of instructor. May be repeated. (Same as Psychology 625.)
Management Science (College of Business Administration)

MAJORS DEGREES
Management Science M.S., Ph.D.
Business Administration MBA

Melissa R. Bowers, Chairperson

Committee Members:
Bowers, Melissa R., Management; Bozdogan, Hamparsum, Statistics; Edirisinghe, Chenaka F., Management; Fowler, Oscar S., Management; Gilbert, Kenneth C., Management; Leitnaker, Mary G., Statistics; Noon, Charles E., Management; Ralston, Bruce A., Geography; Srinivasan, M. M., Management.

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

Management Science coursework will expose students to both the theoretical development of mathematical techniques and their application to managerial decision making. In addition to the development of sufficient mathematical maturity for creative use of quantitative skills, the program requires concentrated study in a supporting area.

Supporting areas are available in other departments of the College of Business Administration (excluding statistics) as well as in computer science, public administration, ecology, and other areas, subject to approval by the Management Science Committee.

Admissions Requirements
The master's program requires three applicant recommendation forms and the GRE or GMAT. Applications are encouraged from all majors, but mathematics background equivalent to the completion of at least two years of college calculus and proficiency in a computer language is required. The program is designed to be completed in three semesters by full-time students. However, students may start the program in any semester and may pursue an M.S. degree in Management Science on a part-time basis.

Course Requirements
- Core Requirements: Management Science 531, 532, 533, 534, Statistics 583
- Applied specialization area (approved by advisor)
- Electives selected from mathematics, statistics, computer science, and/or management science area

TOTAL 38

A thesis option is available to qualified students who substitute 6 hours of thesis credit for the following 9 hours of course work: Management Science 534, 3 hours in the applied concentration area and 3 hours of electives in any area. The Management Science Committee will work closely with the student in tailoring a program to his/her needs. The committee must approve a tentative overall program during the student's first semester and must approve all courses on a semester-by-semester basis.

Recognizing the diverse backgrounds and needs of Management Science M.S. students, the Management Science Committee is prepared to waive some of the above requirements on an individual basis. For example, an undergraduate mathematics major with a strong background may be allowed to take 6 additional hours of electives in place of the mathematics requirements. On the other hand, a student lacking experience in rigorous senior-level mathematics courses will be asked to take such courses to fulfill the 6-hour mathematics requirement. The total course load will remain 38 hours for all non-thesis students and 36 hours for all thesis students; however, the number of hours of electives can be reasonably expected to vary between 6 and 12 as a function of prior background.

THE DOCTORAL PROGRAM
The Ph.D. program in Management Science is designed to prepare students for research related to the application of mathematical tools to complex decision making. Three primary objectives of the program are:
1. to provide, through management science coursework, a thorough knowledge of common Management Science/Operations Research mathematical models and their uses;
2. to provide 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, management, and transportation and logistics) or other disciplines, (e.g., computer science, forestry, ecology, and public administration);
3. to develop in the student, through coursework in mathematics, statistics and computer science, a high degree of mathematical maturity to enhance a potential career in management, research, or teaching.

Admission Requirements
The doctoral program requires three applicant recommendation forms and the GRE or GMAT, in addition to The Graduate School's requirements.

Coursework
A minimum of 48 semester hours of coursework taken for graduate credit (exclusive of thesis or dissertation) is required. Some of this may be the coursework from a master's program although a master's is not a prerequisite for the doctorate. The candidate must complete a minimum of 24 semester hours at The University of Tennessee, Knoxville, at least 6 of which must be at the 600 level. Both of these requirements are exclusive of the thesis or dissertation credits. Entering students who have completed graduate studies in applicable fields will be granted course credits for work which is equivalent to required courses in the program.

The program includes approximately 16 to 20 semester hours of coursework in the applied area.

Qualifying Examinations
The student must demonstrate mastery of probability theory and statistical inference. Statistics 563, 564, by passing a written qualifying examination.

Mastery of 12 to 14 semester hours in mathematics coursework must be demonstrated by passing a written qualifying examination. Topics normally include numerical analysis, either Mathematics 471, 472, 453, and 571; or 571-572, and real analysis, Mathematics 445-446. Other options may be approved. In exceptional circumstances, the faculty will consider waiving the mathematics and/or statistics qualifying examinations.

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

There is no foreign language requirement.

Comprehensive Examination
Prior to admission to candidacy for the degree, and normally after completion of the second year of the program, the student must pass a written comprehensive examination covering the theory of deterministic and stochastic management science models. Topics included in this examination are determined on an individual basis. Students will be expected to demonstrate an integrative ability that goes beyond simple mastery of course content.

Research and Dissertation
The student must complete 24 semester hours of Management Science 600: Doctoral Research and Dissertation, through which he/she is expected to make a significant contribution to the science. A final oral examination is conducted over the dissertation and such other segments of the program that the faculty committee deems appropriate. This orally, which is beyond the minimum 48 hours of coursework, normally is completed in the third year of the program.

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

**PREREQUISITES FOR MANAGEMENT SCIENCE COURSES**

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

**BUSINESS ADMINISTRATION CONCENTRATION**

For complete listing of MBA program requirements, see Business Administration. MBA Concentration: Management Science. Minimum course requirements are 531, 532 and 534.

**GRADUATE COURSES**

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

502 Registration for Use of Facilities (1-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only.


532 Stochastic Models in Management Science (3) Discrete-time Markov chains, Poisson processes, continuous-time Markov chains, renewal theory, and queueing theory. Prereq: Statistics 563 and Mathematical Analysis or consent of instructor. Sp

533 Computational Mathematical Programming (3) Advanced modeling, computational and reporting techniques in practical mathematical programming. Prereq: 531 and proficiency in PASCAL.

534 Application of Management Science Methods (3) Application of methods from 531 and 532 to real world problems. Exposure to existing problem in industry or elsewhere.


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

593 Management Science Problems (1-6) Directed study on subject of mutual interest. E

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

621 Network Flows (3) Treatment of network optimization algorithms, transportation and transshipment models and primal-dual and primal-based tree methods. Prereq: 531 or equivalent.

651 Integer Programming (3) Theoretical and computational aspects of linear programming with integer variables, branch and bound, cutting plane, and group theoretic algorithms. Prereq: 531 or equivalent.

651 Nonlinear Optimization (3) Solution of constrained and unconstrained nonlinear programming problems. Practical algorithms that perform well in recent practice. Prereq: 531 or equivalent.

### Marketing, Logistics and Transportation

(MBA Concentration: Logistics and Transportation)

#### MAJOR

Business Administration MBA, Ph.D.

David W. Schumann, Head

**Associate Professors:**

- Barnaby, D. J., Ph.D. Purdue
- Cadotte, E. R., Ph.D. Ohio State
- Davis, F. W., Jr., Ph.D. Michigan State
- Dicer, G. N., DBA Indiana
- Frye, J. L. (Emeritus), Ph.D. Florida
- Hendrix, F. L. (Emeritus), Ph.D. North Carolina
- Langley, C. J., Jr., Ph.D. Penn State
- Mentzer, J. T. (Business Administration Chair of Excellence), Ph.D. Michigan State
- Mundy, R. A., Ph.D. Penn State
- Patton, E. P., Ph.D. North Carolina
- Woodruff, R. B., DBA Indiana

**Assistant Professors:**

- Boggin, J. H. (Liaison), DBA Indiana
- Gardial, S. F., Ph.D. Houston
- Reizenstein, R. C., Ph.D. Cornell
- Rentz, J. O. (Liaison), Ph.D. Georgia
- Schumann, D. W., Ph.D. Missouri
- Dabholkar, P. A., Ph.D. Georgia State
- Holcomb, M. C., Ph.D. Tennessee
- Johnston, T. C., Ph.D. California
- Moon, M. A., Ph.D. North Carolina

**BUSINESS ADMINISTRATION CONCENTRATIONS**

For complete listing of MBA and Ph.D. program requirements, see Business Administration.

**MBA Concentration: Logistics and Transportation, Marketing**

Minimum course requirements for logistics and transportation—501, 508, and one course from the following: 504, 506, 507, 593, and 599.

For management—511 and 512.

**Ph.D. Concentration: Logistics and Transportation, Marketing**

Minimum course requirements for logistics and transportation—12 hours to include 601, 602, 603. For marketing—12 hours from among the following courses: 601, 602, 603, 604, 605, 606.

**Graduate Courses**

502 Registration for Use of Facilities (1-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only.

503 Buyer Behavior—Analysis for Marketing (3) Consumer behavior concepts and processes developed and applied to market analysis and design, and control of marketing programs. Social psychology and demographic factors that affect consumer product, brand and patronage decisions. Prereq: Business Administration 504 and 505 or consent of instructor.

504 Analyzing Market Opportunity for Marketing Decisions (3) Major determinants of opportunity in markets, framework for finding markets and analyzing them for opportunity, application of market opportunity analysis to marketing strategy decisions. Prereq: Business Administration 504 and 505 or consent of instructor.

506 Marketing Research and Information Planning (3) Design of a rigorous marketing study from inception to implementation of results by recognizing key decision points and critically evaluating merit of research project. Prereq: Business Administration 504 and 505 or consent of instructor.

507 Global Marketing (3) Strategic issues related to international and multi-national marketing operations; identification and evaluation of opportunities in overseas markets; coordination of strategies in world markets.

510 Principles of Marketing Management for Non-MBA Students (3) For students from other disciplines interested in obtaining knowledge of marketing disciplines at graduate level.

511 MBA Marketing Concentration (6) Determination of customer value. Principles of consumer behavior, marketing research, and building customer value. Prereq: Business Administration 504 and 505 or consent of instructor.

512 MBA Marketing Concentration II (6) Delivery of customer value. Communication of customer value, marketing strategy, and providing customer responsive organizations. Prereq: Business Administration 504 and 505 or consent of instructor.

550 Market Opportunity Analysis for New Ventures (3) Concepts for understanding coverage of new venture MOA and various information sources as a guide to identify and analyze sales opportunities in markets for new product or service. Prereq: Consent of instructor.

583 Independent Study (3) Directed research and study. Prereq: MBA Core and consent of instructor. May be repeated. Maximum 6 hrs.

599 Special Topics Seminar (3) Topics vary. Nonbusiness marketing applications, macro-environmental issues, market segmentation, international marketing, services marketing, marketing channels, and related issues. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

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

601 Marketing Theory (3) Nature and scope of marketing, role of theory development and theory testing important to marketing research.

602 Research Methods I (3) Research process: problem formulation, research and experimental design, measurement and implementation of results. Design: experimental design, survey research, and measurement.

603 Marketing Thought (3) Marketing literature across number of areas of research and a particular area of marketing work, determine state of research in each area, and identify areas that merit further study.
Materials Science and Engineering

(Majors in Engineering)

MAJORS

DEGREES

Metallurgical Engineering M.S., Ph.D.
Polymer Engineering M.S., Ph.D.

Joseph E. Spruiell, Head

Professors:

Brooks, C. R., Ph.D. .................................. Tennessee
Buchanan, Raymond A., Ph.D. .................... Vanderbilt
Clark, Edward S., Ph.D. .............................. California
Fellers, J. F., Ph.D. .................................... Akron
Liw, P. K. (Racheff Chair of Excellence), Ph.D. .................................. Northwestern
Lowndes, Douglas H., Ph.D. ...................... Colorado
Lundin, Carl D., Ph.D. ............................... Pennsylvania
Montealegre, Oliver, Ben F., Ph.D. ............... Penn State
Pedraza, A. J., Ph.D. ................................. National (Argentina)
Phillips, Paul J., Ph.D. ............................... Liverpool (UK)
Spruiell, Joseph E. (Liaison), Ph.D. .......... Tennessee
Stansbury, E. E. (Emeritus), Ph.D. .......... Cincinnati

Associate Professors:

Becker, William T., Ph.D. ......................... Illinois
Benson, R. S., Ph.D. ................................ Florida State
Meek, Thomas T., Ph.D. .......................... Ohio State

Graduate programs are offered leading to the degrees of Master of Science and Doctor of Philosophy in Metallurgical Engineering or Polymer Engineering. Both the metallurgical and polymer programs are flexible and interdisciplinary in nature. Students may be admitted from a wide range of disciplines; these include physics, chemistry, chemical engineering, mechanical engineering, electrical engineering, materials engineering, and engineering science programs. Prospective students should consult materials science and engineering faculty concerning development of individual concentration or special programs compatible with their backgrounds and goals.

Areas of concentration within the metallurgical engineering program include physical metallurgy; materials processing; welding; metallurgy and materials joining; corrosion behavior; failure analysis; and mechanical and physical behavior of materials. Specializations in electronic and ceramic materials are available.

Areas of concentration within the polymer engineering program include rheology and polymer processing; polymer morphology, mechanical, physical, and chemical behavior of polymers; and composite materials.

THE MASTER'S PROGRAM

Thesis Option

A total of 30 semester hours is required for the M.S. degree in either Metallurgical Engineering or Polymer Engineering. Additional requirements include:

1. A major consisting of 12 to 18 semester hours of graduate courses in metallurgical engineering or polymer engineering. The polymer engineering major must include 540, 541, 543, 546, 549, 550 and 572 unless similar material has been covered in prior coursework.

2. Additional courses amounting to 6 to 12 hours total in any approved engineering, chemistry, mathematics, physics, or other related fields.

3. Master's thesis, 500 totaling 6 to 12 hours. All resident students are required to register for and participate in the graduate seminar in metallurgical engineering or polymer engineering, as appropriate, during each semester in which it is offered. Credits for the seminar do not count towards satisfying the coursework requirements.

Non-Thesis Option

Under certain conditions, a candidate may apply for a non-thesis option. To be eligible, the candidate must show evidence of significant professional experience after the baccalaureate degree; at least five years of industrial experience or research publications would be examples of such evidence. A departmental faculty meeting will consider each application individually. Upon acceptance, a supervisory committee of three will be appointed, at least two being from the Department of Materials Science and Engineering. The requirements for completion of the non-thesis option are as follows:

1. A total of at least 33 hours in graduate courses in metallurgical engineering, polymer engineering and related areas. The minimum requirement are 21 hours in the Department of Materials Science and Engineering and up to 12 hours in other engineering or science courses. The candidate's degree program must be approved by the faculty committee.

2. Satisfactory completion of a critical review of the literature in an area related to metallurgical, polymer or materials engineering (580).

3. Satisfactory performance in an oral examination to be conducted by the faculty committee and covering the review paper and other areas of metallurgical or polymer engineering.

THE DOCTORAL PROGRAM

Students applying for entrance into the doctoral program must display concrete evidence of ability to perform and report independent research to the satisfaction of the department. The master's thesis may be offered as such evidence.

Department requirements consist of the satisfactory completion of:

1. Graduate courses in materials science and engineering amounting to approximately 24 semester hours, at least eight of which must be in 600 series courses.

2. Supporting courses in related scientific and engineering fields amounting to approximately 24 semester hours, subject to approval by the student's faculty committee. These related fields will normally include chemistry, mathematics, physics, and engineering.

3. The comprehensive examination, usually given in two parts, and covering such topics as materials science and engineering, metallurgical or polymer engineering operations and processes, thermodynamics, technology, ceramics, materials science and engineering, metallurgical or polymer engineering operations and processes, and chemical behavior of materials.

4. Active participation in graduate seminars conducted by the department. Resident students must register for the appropriate 503 or 504 every semester offered.
ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The Ph.D. program in Metallurgical Engineering is available to residents of Virginia; the M.S. and Ph.D. programs in Polymer Engineering are available to residents of Kentucky, Louisiana, or Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

405 Structural Characterization of Materials (4) X-ray diffraction and fluorescence; scanning and transmission electron microscopy; microanalytical techniques.

421 Mechanical Behavior of Materials II (3) Description of stress and strain; linear elastic constitutive equations; isotropic and anisotropic moduli in various materials; yield criteria; brittle fracture; crazing; plastic strain constitutive equations, forming operations and limit criteria. Prereq: Mechanical Behavior of Materials, Mechanisms of Fracture (3) and permission of instructor.

422 Chemical Process Metallurgy (3) Application of chemical thermodynamics to metallurgical processing. Ferrous and nonferrous pyrometallurgy refining, slag-metal equilibria, solidification, gas-metal processing. Prereq: 303.

426 Materials Joining (3) Processes for joining metals, polymers and ceramics: mechanical, adhesive, fusion-solidification/crystallization; surface characteristics necessary for joining and chemical bonding; thermal effects on structure and properties of joints; design of joints. Prereq: Introduction to Materials Science and Engineering.

443 Polymer Processing (3) Rheological measurements; flow through tubes and slits, and effects to extrude swell; selected applications; screw extrusion, injection molding; synthetic fibers, spinning methods, structure development, properties.

444 Plastics Fabrication and Design (3) Lectures, laboratories and field trips; unit operations of plastics fabrication; plastics classification; design and selection criteria; processing techniques; characterization laboratory. Sp

470 Environmental Degradation of Materials (3) Mechanism, techniques, and control of environmental degradation processes in metals, polymers, ceramics and composites; materials selection and design considerations. Introduction to Materials Science and Engineering. Recommended for chemical engineering, mechanical engineering and engineering science and mechanics majors.

472 Fundamental Principles of Composite Materials (3) Establishment of physical principles basic to design, manufacture and application of fiber reinforced polymers, metals and ceramics. Prereq: 302 or equivalent.

474 Biomaterials (3) Metals, polymers and ceramics used in orthopaedic, cardiovascular, and dental surgical implant design and degradation problems; material properties of primary importance; tissue response to synthetic materials. Prereq: 201. Recommended for engineering science and mechanics majors.

475 Fracture-Safe Design (3) Same as Engineering Science and Mechanics 423.

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

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

503 Graduate Seminar in Metallurgical Engineering (1) Prereq: Admission to graduate program. May be repeated. S/NC only. E

504 Graduate Seminar in Polymer Engineering (1) Prereq: Admission to graduate program. May be repeated. S/NC only. E

505 Engineering Analysis (3) Same as Chemical Engineering 506.

522 Defects in Crystals (3) Analytical and experimental analysis of defect interactions in solids. Prereq: 451 or consent of instructor.

523 Plastic Deformation of Metals (3) Geometry and mechanisms of single crystal plastic deformation; slip, twinning, and cleavage; work hardening, effect of temperature and strain rate; effects of testing conditions on flow curves; work hardening, flow curves; dislocation theory; polycrystalline behavior in terms of single crystal deformation mechanisms; texture formation. Prereq: 302, 320 or consent of instructor.

524 Metallurgical Thermodynamics (3) Applications of chemical thermodynamics to metallurgical problems: refining, oxidation, surface treatments, alloy systems. Prereq: 570 or equivalent.

525-26 Welding Metallurgy (3,3) Welding processes; physical metallurgy of welding; phase transformations; heat flow; residual stresses; theories of hot cracking, cold cracking and porosity formation; applications to process utilization.

528 Ceramic Matrix Composites: Material and Mechanics (3) Same as Engineering Science 526.

529 Diffusion in Solids (3) Phenomenon and atomic mechanisms of diffusion in solid state. Solution and applications of diffusion equations; random walk problems and mechanisms of diffusion; diffusion in dilute and concentrated alloys; Kirkendall effect; high diffusivity paths.

530 Phase Transformations in Metallic Materials (3) Thermodynamics of phase equilibrium, theory of nucleation in solids; kinetics and morphology of diffusion controlled growths; kinetics of interface controlled phase transformations; crystallography and kinetics of martensitic transformations.

531 Advanced Corrosion (3) Analyses of corrosion processes in terms of polarization measurements and Pourbaix diagram. Influence of environmental and mechanical factors contributing to pitting, crevice, fretting, wear, fatigue and stress corrosion. Prereq: 470 or consent of instructor.


540 Basic Polymer Chemistry (3) Synthesis, reactions and degradation of polymers. Polymer characterization; solution methods and spectroscopy. Prereq: Semester of organic chemistry and thermodynamics or equivalent.

541 Fluid Mechanics and Polymer Processing (3) Navier-Stokes equations and illustrative problems; applications in theoretical engineering and polymer engineering, packed and fluidized beds, multiphase systems. Basic concepts in rheology; applications in polymer processing; screw extrusion, fiber spinning, injection molding. (Same as Chemical Engineering 541.)

542 Further Topics in Polymer Processing (3) Description and analysis of selected polymer processing operations. Prereq: 541.


544 Polymer Solution Thermodynamics and Characterization (3) Theories of solutions, statistical thermodynamics, characteristic phenomena of polymers, linear viscoelasticity, light scattering and osmotic pressure. Prereq: Undergraduate physical chemistry.

545 Mechanical Properties of Solid Polymers (3) Types of mechanical behavior, Hookean and rubber elastic behavior, deformation, fracture, linear viscoelasticity; dynamic mechanical behavior and testing; loss tangent; experimental methods. Introduction to mechanical properties of polymeric composites.

549-50 Laboratory Methods in Polymer Engineering (1-1) Basic experimental techniques and instrumentation associated with characterization, x-ray and light scattering, calorimetry, rheometry, mechanical properties of solid polymers, polymer processing operations. Coreq: 540 or consent of instructor.

560 Principles of Ceramic Processing (3) Treatment of ceramic processes, preparation and characterization; powder consolidation; drying, firing, sintering techniques, mechanisms and kinetics. Prereq: 380 or equivalent.

561 Inorganic Glass Forming Systems (3) Physical and chemical nature of glassy materials; structural theories of glass formation; major groups forming systems: silica, oxide glasses, nitrate glasses, water glasses, and chalcogenide glasses. Prereq: 360, Chemistry 374.

582 Experimental Mechanics of Composite Materials (3) Same as Engineering Science 562.

571 Electron Microscopy (3) Operation of electron microscope; kinematic and dynamical diffraction theory; structure determination; analysis of lattice defects. Prereq: 485 or equivalent.

572 X-Ray Diffraction (3) Symmetry of crystals, space group theory, reciprocal lattice and application to definition of structures; powder and single crystal x-ray techniques, introduction to crystal structure determination; characterization of orientation; application to inorganic, metallic and polymer structures.

574 Formability of Materials (3) Modeling and analysis of finite plastic strain with application to primary and secondary forming operations; crystalline and noncrystalline materials, flow localization, fatigue, predictability, testing. Prereq: Consent of instructor.

576 Special Topics in Materials Science and Engineering (3) Topics of current significance and interest. Prereq: Consent of instructor. May be repeated.


600 Doctoral Research and Dissertation (1-15) P/NP only. E

521-22 Theoretical Metallurgy (3,3) Topics in solid state physics as applied to metallurgy; introduction to quantum theory, specific heats, electron theory of solids, electrical and thermal conductivity, magnetic properties, theories of alloy formation. Prereq: Consent of instructor.

523-24 Solidification and Crystal Growth (3,3) Theories of solidification, fluid flow effects, magnetohydrodynamic of incompressible fluids, growth stability theory, thermodynamic applications, rapid solidification theory, metastability. Prereq: Consent of instructor.

641 Advanced Rheology and Viscoelastic Theory (3) Continuum mechanics, formulation of viscoelastic theories for describing deformation and flow of polymeric materials. Application to polymer processing problems. Recommended for MS candidates working in rheological areas. Prereq: 541.

642 Advanced Topics in Polymer Processing (3) Application of theories of rheological behavior and structure development to analysis of polymer processing operations. Prereq: 541. (Same as Chemical Engineering 642.)

643 Phase Transformations in Polymers (3) Glass transition and glassy state; annealing of polymeric glasses; crystallization of polymers; nucleation, growth and morphology; secondary nucleation theory; solidification of polymers; crystallization under stress. Prereq: 543.

671 Quantitative Microscopy (3) Principal acoustic, optical, x-ray neutron, electron and field-ion techniques for examination of microstructures of materials. Prereq: 405.

676 Advanced Topic in Materials Science and Engineering (3) Latest developments and/or advanced special topics. Prereq: Consent of instructor. May be repeated.

678 Seminar in Recent Advances in Materials Science and Engineering (3) Directed and independent study of advanced topics. Prereq: Consent of instructor. May be repeated.
Mathematics (College of Arts and Sciences)

MAJOR DEGREES

Mathematics ................................................ M.M., M.S., Ph.D.
John B. Conway, Head

Professors:
Alexiades, V., Ph.D. ................................ Delaware
Alfakho, N., Ph.D. ........................................ Brown
Anderson, D. F., Ph.D. ................................ Chicago
Baker, G. A., Ph.D. ........................................ Cornell
Bradley, John S. (Emeritus), Ph.D. ........ Iowa
Carruth, J. H., Ph.D. ....................................... Louisiana State
Clark, C. E., Ph.D. ........................................... Wisconsin
Conway, J. B., Ph.D. ....................................... Louisiana State
Dawson, Robert J., Ph.D. ......................... Wisconsin
Dobb, D. E., Ph.D. ........................................ Cornell
Dydek, J., Ph.D. ............................................. Warsaw
Frandsen, Henry, Ph.D. ...................... Illinois
Gross, J. L., Ph.D. ............................................ Cornell
Hallam, T. G., Ph.D. ......................................... Missouri
Hinton, D. B., Ph.D. ......................................... Tennessee
Husse, L. S., Ph.D. ........................................... Florida State
Johannson, K., Ph.D. ........................................ Bielefeld
Jordan, G. Samuel, Ph.D. ......................... Wisconsin
Karakashian, O., Ph.D. ......................... Harvard
Kupershmidt, B. A. (UTSI), Ph.D. .... MIT
Lenhart, S., Ph.D. ............................................ Kentucky
McConnell, R. M., Ph.D. ....................... Illinois
Mathews, H. T., Ph.D. ..................................... Tulane
Miller, D. J. (Emeritus), Ph.D. ........... Michigan
Rajput, B. S., Ph.D. ...................................... Illinois
Reddy, K. C. (UTSI), Ph.D. ....................... Indian IT
Rosinski, J., Ph.D. ....................................... Wroclaw
Saeger, P. W., Ph.D. ....................................... Maryland
Sarbin, Steve, Ph.D. ................................. Cornell
Simpson, H., Ph.D. ....................................... Cal Tech
Son, K., Ph.D. ................................................. Oregon State
Son, P., Ph.D. ................................................ Oregon State
Stallman, F. W. (Emeritus), Ph.D. ....... Giesen
Stephenson, K. R., Ph.D. ......................... Wisconsin
Sundberg, C. Ph.D. ........................................ Wisconsin
Thistlethwaite, M. B., Ph.D. .................. Manchester
Wade, W. R., Ph.D. ................................... California (Riverside)
Wagner, C. G., Ph.D. ............................... Duke

Associate Professors:
Freire, A., Ph.D. ........................................ Princeton
Kimble, K. R. (UTSI), Ph.D. ............ Ohio State
Kot, Mark, Ph.D. ............................................ Duke
Kuo, Y., Ph.D. ............................................ Cincinnati
Muyay, S., Ph.D. ........................................ Purdue
Pflaut, Conrad, Ph.D. ................................. Maryland
Richer, Stefan (Laisson), Ph.D. ........ Michigan
Row, W. H., Jr., Ph.D. ............................... Wisconsin
Smith, J., Ph.D. ........................................... California

Assistant Professors:
Collins, Charles R., Ph.D. ..................... Minnesota
Feng, Xiaobing, Ph.D. ............................... Purdue
Gavrilets, Sergey, Ph.D. ................... Moscow State
Guan, B., Ph.D. ........................................ Massachusetts
Hill, Emery, Ph.D. ....................................... Virginia
Qin, Jinshui, Ph.D. ....................................... Pennsylvania State
Tong, Jie, Ph.D. ........................................... North Carolina

The Mathematics Department has three graduate degrees: (1) the Master of Mathematics degree, intended primarily for teachers, provided the constraints of the latter option have not been violated. A student’s status after electing such transfer is determined by the complete history of the student’s earlier mathematics examinations from the standard program and the interdisciplinary mathematical ecology concentration. Descriptions of both programs are given below.

2. Demonstrate proficiency in one foreign language, normally French, German, or Russian. This requirement must be met prior to the examinations in the area of specialization. A student’s doctoral committee may require the student to pass a second language examination.

3. Pass an examination in the field of specialization. After the requirements in 1. and 2. have been met, this examination will be given by a committee appointed by the department head. A student may take this specialty examination only twice.

4. Pass a one-year, 600-level sequence in mathematics outside the student’s area of specialization. The sequences selected to fulfill this requirement must be approved by the department head and the student’s doctoral committee. (Such approval may occur after completion of the sequence.) Requirements 1-4 must be completed no later than the start of a student’s seventh year (as a mathematics graduate student at UT Knoxville).

Standard Program

Demonstrate knowledge in five subjects selected from the groups listed below by passing written examinations in three subjects and by earning grades of B+ or better each semester in the courses associated with two additional subjects. Three subjects selected for written examinations must be from Groups I, II, or III. At least two groups must be represented in the three written examinations. At least three groups must be represented in the five subjects.


A student’s five subjects may not include both Real Analysis and Applied Linear Analysis or both Mathematical Principles of Fluid Mechanics and Mathematical Principles of Continuum Mechanics. A student may not count examinations in both Ordinary Differential Equations and Partial Differential Equations, but both may be included in a student’s five subjects. Without prior approval of the graduate committee, a student may utilize as a Group IV course a year-long graduate-level sequence from outside the Department of Mathematics. At most one such utilization may be made.

A student may take as many written examinations as desired at any time the examinations are given, subject to the following conditions:

a. The examinations to be taken must be approved in advance by the student’s advisory committee.
b. At any one time a student may take at most only the number of examinations necessary to complete the requirements. 

c. A student may take a collection of written examinations a maximum of 3 times, but no one failing 4 examinations, counting possible repetitions, will be permitted to take another examination. An exception is that a student who does not have a master's degree in mathematics and who has been enrolled in a UTK graduate program in mathematics no longer than one year may take written examinations at one time during that year without having that sitting for the examinations or any incurred failure(s) count toward the limits imposed above. 

d. At least two examinations must be taken and at least one must be passed before the start of a student’s fourth year. Three examinations must be passed before the start of a student’s fifth year. 

"In lieu of earning a grade of B- or better each semester in a sequence from Group I, II, or III, a student may demonstrate proficiency in that subject by passing the associated written examination. For this purpose, only one examination is permitted for each subject. The use of a written examination must be declared before the examination is taken so that the sitting for the examination and any failure are not counted toward the limits in condition c.

Mathematical Ecology Concentration

The student must pass written examinations in three subjects:

2. A subject from Group I, II, or III of the standard program.
3. A subject represented by a year-long graduate-level sequence from outside the Department of Mathematics. The sequence must be approved in advance by the mathematical ecology faculty and by the departmental Graduate Committee. At least one member of the mathematical ecology faculty must be involved in the grading of the examination. The examination in this subject may be taken only twice.

The student also must earn grades of B+ or better each semester in the courses associated with each of the three subjects from the groups listed in the standard program. This requirement may not be satisfied with courses from outside the department. At least one of the subjects used to meet this requirement or the written examination subject in 2. must be from Groups I and II.

Except for the privilege of utilizing as a Group IV course a course from outside the department, this concentration is subject to the constraints and privileges specified in the standard program, including the restrictions on related subjects, the conditions a. through d. placed on the taking of written examinations, and the option to pass a written examination in lieu of earning a grade of B+ or better each semester in a sequence from Group I, II or III.

GRADUATE COURSES

400 History of Mathematics (3) Development of major ideas in mathematics from ancient to modern times and influence of ideas in art, music, philosophy, science, and other areas. Writing emphasis course: at least one in-class essay examination and 3000 words of writing outside classroom. Prereq: Matrix Algebra I and Introduction to Abstract Mathematics.

401 Mathematics and Microcomputers (3) Primarily for students seeking certification as mathematics teachers at secondary level. Use of microcomputers to study concepts and problems in mathematics. Does not satisfy the major requirements for B.S. or M.S. in mathematics. Prereq: Calculus I.

404 Applied Vector Calculus (3) Topics from multivariable and vector calculus: line and surface integrals, divergence theorem and theorems of Gauss and Stokes. Prereq: Calculus II or Biocalculus II.


421 Combinatorics (3) Introduction to problems of construction and enumeration for discrete structures: sequences, partitions, graphs, finite fields and geometries, error-correcting codes, designs. Prereq: Probability and Statistics or consent of instructor.


425 Statistics (3) Derivation of standard statistical distributions: t, F and ?2; independence of sample mean and variance with large samples; limit theorems; point estimation, Bayesian estimates; statistical hypothesis, Neyman-Pearson theorem; likelihood ratio and other parametric and non-parametric tests; sufficient statistics. Prereq: Probability I or consent of instructor.


437 Complex Variables I (3) Theory of functions of complex variable: residue theory and contour integrals. Prereq: Calculus III. Recommended prereq: 300- or 400-level mathematics course.

440 Complex Variables II (3) Applications of complex variables to steady-state temperatures, electromotive forces, and fluid flow. Prereq: 443.

445-46 Advanced Calculus I, II (3,3) Theory of sequences, series, differentiation, and Riemann integration of functions of one or more variables. Prereq: Calculus III and Introduction to Abstract Mathematics, or consent of instructor.


452 Algebra II (3) Field theory and Galois theory. Prereq: Algebra I.


456-57 Abstract Algebra III, IV (3,3) Linear algebra, Galois theory, and group theory. Prereq: Algebra II.

458-59 Abstract Algebra V, VI (3,3) Representation theory of groups. Prereq: Algebra IV.

460 Geometry (3) Axiomatic and historical development of neutral, Euclidean, and hyperbolic geometries stressing geometric proof and critical reasoning. Models of Non-Euclidean geometries. Prereq: Introduction to Abstract Mathematics, or consent of instructor.

461 Topology (3) Topology of plane and plane, separation properties, compactness, connectedness, continuity, functions, homeomorphisms, and continua and topological invariants. Prereq: Calculus III and Introduction to Abstract Mathematics, or consent of instructor.

471 Numerical Analysis (3) Computation, approximations, and applications of interpolation and approximation by polynomials and piecewise polynomials. Quadrature and numerical solution of initial and boundary value problems of ordinary differential equations, stiff systems. Prereq: Numerical Algorithms I or consent of instructor. (Same as Computer Science 471.)


475 Industrial Mathematics (3) Modeling, analysis, and computation applied to scientific/technical/industrial problems. Prereq: Differential Equations I and either Computer Literacy for Mathematics or Numerical Algorithms, or consent of instructor.

490 Readings in Mathematics (1-3) Open to superior students with consent of department head. Independent study with faculty guidance. Prereq: Consent of faculty mentor to supervise independent work. May be repeated. Max. 9 hrs.

499 Seminar in Mathematics (1-3) Topics vary. Requires out-of-class projects and in-class presentations by students. Credit hours announced for each seminar. Prereq: Consent of instructor. May be repeated. Max. 9 hrs.

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

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

504 Discrete Mathematics for Teachers (3) Mathematical logic and methods of argument, sets, functions and relations, combinatorics. Normally first graduate course for students seeking M.M. degree. For students in Master of Mathematics program and for students in graduate programs in College of Education. May not apply toward M.S. degree in mathematics. Prereq: 1 yr calculus or equivalent.

505 Analysis for Teachers (3) Development of differential and integral calculus, proofs of basic theorems. For students in Master of Mathematics program and for students in graduate programs in College of Education. May not apply toward M.S. degree in mathematics. Prereq: 1 yr calculus or equivalent.

506 Algebra for Teachers (3) Algebraic structures: integral domains and fields and their applications to algebraic integers and algebraic numbers. For students in Master of Mathematics program and for students in graduate programs in College of Education. May not apply toward M.S. degree in mathematics.


509 Seminar for Teachers (3) For students in Master of Mathematics program and for students in graduate programs in College of Education. May not apply toward M.S. degree in mathematics. Prereq: Consent of instructor. May be repeated. Max. 12 hrs.

510 Applied Mathematics Laboratory (1) Computer applications in applied mathematics, software packages for matrix analysis, symbolic algebra, and differential equations. Coreq: 511 or 512. May be repeated.

511-12 Methods in Applied Mathematics (3,3) Fundamental principles and techniques associated with discrete and continuous models of physical, engineering and biological systems: difference equations, networks and graphs, optimization, time series analysis, and analysis of differential and delay-differential equations, and other topics. Coreq: 510. Prereq or coreq: 445 or 447, and 453.
Mechanical and Aerospace Engineering and Engineering Science

(College of Engineering)

MAJOR DEGREES

Aerospace Engineering ...................... M.S., Ph.D.
Engineering Science ......................... M.S., Ph.D.
Mechanical Engineering ..................... M.S., Ph.D.

D. W. Dareing, Head

Professors:
Antar, B. (UTSI), Ph.D. ....................... Texas
Arnimi, R. V., Ph.D. ........................ VPI
Baker, A. J., PE, Ph.D. ........................ New York
Braun, G. W. (Eremits), Ph.D. ............... Gottingen
Carley, T. G. (Liaison), PE, Ph.D. .......... Illinois
Collins, F. G. (UTSI), Ph.D. ............... California
Crawford, R. A. (UTSI), Ph.D. ............. Tennessee
Dearing, D. W., P.E., Ph.D. ................. Pennsylvania
Dubey, R. V., Ph.D. .......................... Clemson
Edmondson, A. J., PE, Ph.D. ............... Texas A&M
Flandro, G. A. (UTSI), Ph.D. ............... Cal Tech
Forrester, J. H., PE, Ph.D. .................. Iowa State
Forty, J. W. (Eremits), Ph.D. ............... Toulouse (France)
Garrison, G. W. (UTSI), Ph.D. .............. NC State
Hodgson, J. W. (Fisher Prof.), PE, Ph.D.  .......... Georgia Tech
Holland, R. W. (Eremits), PE, M.S. ....... Tennessee
Jendrucko, R. J., PE, Ph.D. ................. Virginia
Johnson, W. S., PE, Ph.D. .................. Clemson
Keefe, D. R. (UTSI), Ph.D. .................. Florida
Keyhani, M. (Liaison), Ph.D. .............. Ohio State
Kim, K. H., Ph.D. ............................ NC State
Krane, R. J., Ph.D. .......................... Oklahoma
Krieg, R. D. (Condra Chair of Excellence), Ph.D. ........ New Mexico
Landes, J. D., PE, Ph.D. .................... Lehigh
Lee, C. W. (Eremits), Ph.D. ............... Illinois IT
Lifton, J., H. (Eremits), M.E.A. ............ George Washington
Lo, C. F. (UTSI), Ph.D. ..................... Cornell
McCay, M. H. (UTSI), PE, Ph.D. ........... Florida
McCay, T. D. (UTSI), Ph.D. .................. Auburn
Maxwell, R. L. (Eremits), PE, M.S. ....... Case Western
Milligan, M. W., PE, Ph.D. ................. Tennessee
Newman, M. K. (Eremits) (UTSI), Ph.D.  ..... Oregon
Parang, M. PE, Ph.D. ........................... Oklahoma
Parsons, J. R., PE, Ph.D. ................... NC State
Peters, C. E. (UTSI), D.A.S. ............... Brussels
Pih, H. (Eremits), PE, Ph.D. ............... Illinois IT
Pitts, D. R. (Eremits) Ph.D. ................. Georgia Tech
Remenyik, C. J. (Eremits), Ph.D. .......... Johns Hopkins
Schulz, R. (UTSI), Ph.D. ..................... Tennessee
Scott, W. E. (Eremits), Ph.D. ............... Johns Hopkins
Shahroki, F. (UTSI), Ph.D. .................了很多
Shobe, L. R. (Eremits), PE, M.S. ......... Kansas State
Smith, G. V., PE, Ph.D. ...................... Penn State
Snyder, W. T., Ph.D. ........................ Northwestern
Sollman, Q. E., Ph.D. ........................ Tennessee
Speckhart, F. H. (IBM Prof.), PE, Ph.D. .... Georgia Tech
Stair, W. K. (Eremits), M.S. ............... Tennessee
Stoneking, J. E., PE, Ph.D. ................. Illinois
Tucker, P. C. (Eremits), M.S. .............. Georgia Tech
Wasserman, J., PE, Ph.D. .................. Cincinnati
Weitsman, Y. J., Ph.D. ...................... Rensselaer
Willkerson, H. J., PE, Ph.D. ............... Tennessee
Wilson, C. C., Ph.D. ........................... Purdue
Wu, J. M. (UTSI), Ph.D. ..................... Cal Tech
Young, R. L. (Eremits) (UTSI), Ph.D. .... Northwestern

Associate Professors:
Becker, S. E., PE, Ph.D. ..................... NC State
Boulet, J. A., M. Ph.D. ...................... Stanford
Caruthers, J. E. (UTSI), Ph.D. ........... Georgia Tech
Engle, R. C. (Eremits), Ph.D. .......... VPI
Finkel, J. L, Ph.D. .......................... Virginia
Hamel, W. R., Ph.D. ......................... Tennessee
Madhukar, M. S., Ph.D. ...................... Drexel
Mathews, A. E., PE, Ph.D. .................. Illinois
Moulden, T. H. (UTSI), Ph.D. .............. Tennessee
Nguyen, K., Ph.D. ........................... Colorado
Steinhoff, J. S. (UTSI), Ph.D. ............. Chicago
Vekili, A. D. (UTSI), Ph.D. .............. Northwestern

Assistant Professors:
Cezeaux, J. L., Ph.D. ............................ Rensselaer
Iannelli, G. S. (Eremits), Ph.D. .......... Tennessee
Kawiecki, G., Ph.D. .......................... West Virginia
Lyne, J. E., M.D., Ph.D. ........................ NC State
Ponake, C. D., PE, Ph.D. ...................... Georgia Tech
Rao, R. L. (UTSI), Ph.D. .................... Georgia Tech
Yu, N., Ph.D. ................................ California (San Diego)

Graduate programs leading to the degrees of Master of Science and Doctor of Philosophy are available with majors in Mechanical Engineering, Aerospace Engineering, and Engineering Science. Changing from one of these programs to another requires departmental approval. Each student is advised as to any prerequisite courses before entering a program.

In Mechanical Engineering, program concentrations include energy conversion and utilization; propulsion; heat transfer and fluid mechanics; thermodynamics; space engineering; gas dynamics; machine design and dynamics; power generation; and stress analysis.

In Aerospace Engineering, program concentrations include energy conversion and utilization; propulsion; heat transfer and fluid mechanics; thermodynamics; space engineering; aerodynamics and gas dynamics; flight mechanics; aeroacoustics; and structures and stress analysis.

In Engineering Science, program concentrations include energy conversion and utilization; propulsion; heat transfer and fluid mechanics; computational mechanics; biomedical engineering; and optical engineering (UTSI only). In each of these concentrations, interdisciplinary programs are arranged to meet individual needs or interests. The flexibility and interdisciplinary approach of the program concentrations are intended to be of particular interest to prospective students currently employed in research, development, or design activities and whose interests in continuing education (either full-time or part-time) lie at one of the interfaces between science and engineering. Each student can meet his program's course offerings and research activities also intended to meet the needs of students who seek preparation for employment in engineering areas requiring specialization in mechanics or in related interdisciplinary studies such as biomechanics.

In Mechanical Engineering or Aerospace Engineering, entrance into the Master of Science program is available to qualified graduates of recognized undergraduate curricula in mechanical or aerospace engineering and to qualified graduates of other curricula who satisfy the necessary prerequisites. Admission into the doctoral program will be granted to those applicants who have demonstrated superior achievement in their engineering backgrounds. The general GRE is required of all international applicants for admission.

In Engineering Science, entrance into the graduate program is available to graduates of recognized curricula in engineering, mathematics, or one of the physical or biological sciences. A program application is required in addition to the Graduate School application. The names and addresses of up to four references must be included with the program application. The general GRE is required of all international applicants for admission.

Each student must satisfactorily complete a program of study that has been approved by his/her advisory committee and complies with the requirements of the Graduate School. In Engineering Science, the student's major professor may be selected from a department other than the Department of Mechanical and Aerospace Engineering and Engineering Science; however, at least one member of the student's graduate advisory committee must be on the faculty of the Department of Mechanical and Aerospace Engineering and Engineering Science.

THE MASTER'S PROGRAM

In both Mechanical Engineering and Aerospace Engineering, three M.S. options are
offered. Option I requires a thesis, while options II and III do not. Option I is the normal program for recent graduates. Options II and III provide graduate students with significant professional work experience the opportunity to focus their programs in special areas through either greater course work or selected engineering problems. Credit requirements for these three options are summarized below.

### Course Areas

<table>
<thead>
<tr>
<th>Hours Required</th>
<th>Option I</th>
<th>Option II</th>
<th>Option III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics (400 level or above)</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Engineering courses below 500 (maximum)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Thesis credit</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Problems credit (590)</td>
<td>n/a</td>
<td>n/a</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

All three program options require participation in the departmental graduate seminars program, and passing a final examination on all work submitted for the degree. Option II final examination will cover all course work. Option III final examination will cover all the selected engineering problems.

The thesis option, Option I, requires submission and defense of a written thesis that demonstrates the ability to conduct and report an independent investigation.

The problems option, Option III, requires a formal report to be written for each selected engineering problem.

In Engineering Science, two M.S. options are offered: Option I requires a thesis, while Option II does not. The Option II is restricted to those students who have had significant engineering professional work experience. In Option I, a minimum of 30 semester hours, including the thesis, is required. In Option II, a minimum of 30 hours is required. Credit requirements for these two options are summarized below.

### Course Areas

<table>
<thead>
<tr>
<th>Hours Required</th>
<th>Option I</th>
<th>Option II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursework</td>
<td>24</td>
<td>30</td>
</tr>
<tr>
<td>Mathematics</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

**Engineering courses** (Major concentration may include but is not restricted to courses offered by the Department.)

1. Additional courses (May include additional courses in mathematics, computer science, or the physical and life sciences as well as engineering courses.)
2. Thesis

**Total**

12 15 6 9 30 30

*Aerospace Engineering*

NOTE: Not all the courses listed below are available at both the UT Knoxville and the UT-SI campuses.

#### GRADUATE COURSES

**422 Aerodynamics (3)** Theory and design of aero-dynamic bodies for desired characteristics. Potential flow theory, viscous effects, compressibility effects. Subsonic, transonic, and supersonic flight. Prereq: 370, F

**423 Viscous Flow (3)** Boundary layer theory; laminar and turbulent flow; compressibility effects; numerical solution methods. Prereq: 422 or Heat Transfer or consent of instructor. Sp

**424 Astronautics (3)** Propulsion, trajectories, guidance, control, and atmospheric reentry of space vehicle systems. Prereq: 362, Mechanical Engineering 332. Sp

**425 Propulsion (3)** Principles of propulsion devices; turbojet, ramjet and rocket engines. Prereq: 351, F

**426 Introduction to Aerospace Design (2)** Design processes, synthesis, safety, reliability, patents, product liability, economic analysis, optimization, design standards, design studies. Individual design reports. Prereq: 351, 370, 353. Coreq: Mechanical Engineering 344. F

**429 Aerospace System Design (4)** Synthesis and design of complete aerospace system, economic and technical aspects. Participation in team design effort, formal presentations and design report. Prereq: 425, 426. Sp

**449 Aerospace Engineering Laboratory (3)** Designing, conducting, and reporting results of experimental exercises. Test standards and specifications. Analysis of data and formation of conclusions. Prereq: 345, 351, 3 labs, F

**455 Selected Topics in Aerospace Science (1-4)** Current problems and topics in aerospace science. Prereq: Consent of instructor.

**511 Inviscid Flow (3)** Kinematics and dynamics of inviscid fluids; potential flow about a body, conformal mapping. Prereq: 422 or Mechanical Engineering 331. Mathematics 425 or equivalent.

**512 Viscous Flow (3)** Equations of viscous fluid flow; laminar and turbulent flow; transition; separation; boundary layer theories; exact and approximate solutions. Prereq: Mechanical Engineering 351 or equivalent.

**513 Experimental Methods in Fluid Mechanics (3)** Experimental techniques with laboratory experiments; representative experiments: hot wire anemometry and turbulence measurements, flow visualization, wind tunnel tests, water table experiments, supersonic flow experiments, boundary layer measurements, laser-optical measurements. Prereq: 423 or Mechanical Engineering 351.

**515-16 Air Vehicle Aerodynamics and Performance (3,3)** Application of aerodynamics principles to air vehicles to provide estimates of performance, stability, and control characteristics for subsonic to hypersonic speeds. Relations among thrust, drag, lift and altitude, propulsion systems, vehicle performance characteristics, and trajectory optimization. Prereq: 422; 515 for 516.


**525 Hypersonic Flow (3)** Hypersonic flow, boundary layer, Newtonian theory, blunt body flow, viscous interactions, free molecule and rarefied gas flow. Prereq: 512.
527-28 Aerospace Ground Test Facilities (3,3) Atmospherics models and similarity considerations; aerodynamic test facilities: continuous and intermittent, tunnels and ballistic ranges; propulsion test facilities or air breathing and rocket engines, space environment and space vehicle test facilities. Prereq: 512 and 521, Mechanical Engineering 522.

529 Rarefied Gasdynamics (3) Binary elastic collisions; kinetic theory; flow regimes, Boltzmann and model equations, transfer equation, gas-surface interactions, slip boundary conditions, free molecule, slip and transition flow, Knudsen number; experimental techniques; introduction to hypersonic real gas flows. Prereq: 522, Mechanical Engineering 522.

531 Magnetohydrodynamics (3) Electromagnetic field theory, chemical kinetics, thermal dynamics, and thermophysical properties of gases; plasmas; governing equations and applications. Prereq: 422 and Mathematics 471.

532 Introduction to Turbulence (3) Microscopic effects, analogies, statistical treatment, correlation functions, energy spectra, diffusion; introduction to turbulent jets and pipe flow. Prereq: 511-12.

534 Atmospheric Entry (3) Reentry trajectories; lift and drag during reentry; vehicle motion and stability during reentry; aerodynamic heating and heat protection systems. Prereq: 522. Recommended prereq: 512.


551 Aerospace Mechanics (3) Principles of mechanics applicable to aerospace vehicles, equations of motion, multibody systems, and trajectory analysis. Prereq: Mathematics 561 or equivalent.

554 Aerospace Vehicle Stability and Control (3) Static and dynamic longitudinal directional and lateral stability and control. Coupled modes. Motion with free and fixed flight surfaces. Automatic control systems. Prereq: 425-51, 551.


561 Fundamentals of Aerocoustics (3) Generation, propagation and absorption of sound in static and moving media. Prereq: Consent of instructor.

564 Spacecraft Attitude Dynamics and Control (3) Rotational attitude dynamics of space vehicles. Gyroscopic instruments, passive and active attitude control devices. Linear control theory and attitude stabilization. Prereq: 551, Mathematics 471.

574 Space Engineering: Satellite Technology (3) Satellites and rockets (orbit, launch vehicles and launching); spacecraft structure, power systems, attitude control systems; satellite data and information, and communication systems. Prereq: 425, Mathematics 471, 404.

580 Selected Engineering Problems (2-6) Enrollment limited to students in programs program. Prereq: Consent of advisor.

599 Special Topics in Aerospace Engineering (1-3) May be repeated. Maximum 6 hrs.

631 Magnetohydrodynamics II (3) Alfvén and shock waves, exact solution for magnetohydrodynamic channel flow, one-dimensional model of channel flow, engineering applications of magnetohydrodynamics, propulsion and power generation. Prereq: 631 and Mathematics 562.

641-42 Physical Gas Dynamics (3,3) High speed, high temperature gas flow from molecular point of view. Kinetic theory, statistical mechanics, equilibrium flow, vibrational and chemical rate processes, non-equilibrium vibrational and chemical flow, non-equilibrium kinetic theory, flow with transition non-equilibrium. Prereq: 522, Mechanical Engineering 522.

654 Theory of Turbulence (3) (Same as Engineering Science and Mechanics 645.)

651-52 Advanced Aerodynamics (3,3) Subsonic, transonic, supersonic, and hypersonic flows treated in generalized and unified manner with combined viscous-inviscid effects. Relationships among various regimes of fluid flows. Fundamental assumptions, limitations of approximations and consequences. Foundations of gas dynamics, applications to airplanes, rockets, ground testing and jet propulsion. Discussion of special topics according to interest of students. Prereq: 511, 522.


690 Advanced Topics in Aerospace Engineering (3) Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

Engineering Science

GRADUATE COURSES

421 Materials of Engineering (3) Mechanical properties of engineering materials; data collection and processing; time dependent and cyclic dependent properties. Prereq: 321, Materials Science and Engineering 201. 3 hrs or 2 hrs and 1 lab.

423 Fracture-Safe Design (3) Critical review of variables controlling fracture toughness; past and flaw geometry, fracture mechanics analysis of materials; characterization of fracture toughness by stress intensity factors; strain energy release rates, J integral, COD data, transition temperature, fracture toughness design. Prereq: 321 and Materials Science and Engineering 201. (Same as Materials Science and Engineering 475.) 3 hrs or 2 hrs and 1 lab.

433 Dynamic Systems (3) Three dimensional dynamical systems of particles and rigid bodies; gyroscopes; variable mass systems; central force motion; Lagrange's equations; stability; transfer functions. Prereq: Dynamics. 435 Engineering Acoustics (3) Concepts of acoustics, measures of sound and their units; noise generation and transmission, noise control principles and application, materials and procedures for noise abatement. Prereq: Senior standing or consent of instructor.

442 Fluid Mechanics II (3) Differential form of basic laws: compressibility, isentropic flow, shocks, duct flows; viscosity; viscous flow; boundary layers; critical flow, energy methods; internal and external viscous flows, boundary layers, elementary turbulent closure models. Prereq: 341, Mathematics 231.

461 Experimental Stress Analysis (3) Theory, techniques, and instrumentation of resistance strain gauges; stress analysis and cracktip plastic zone; fatiguelife prediction; stress analysis; crack tip plastic zone; energy principles in fracture mechanics; fatigue-crack initiation and propagation; fracture mechanics design and fatigue life prediction. Analytical, numerical, and experimental methods for determination of stress-intensity factors. Current topics in fracture mechanics. Prereq: Consent of instructor.

462 Carbone Matrix Composites: Material and Mechanics (3) Matrix materials, microstructure and microstructural design; fabrication of ceramic matrix composites, interface characterization and mechanics; electron microscopy examination, nondestructive evaluation; fracture, fatigue, and fracture toughness; Prereq: 459 or consent of instructor (Same as Materials Science and Engineering 528.)


473 Biomechanics (3) Mechanical properties of living tissues; biomechanics of injury; mechanics of prostheses; material compatibility of prosthetic devices; biomechanical problems related to impact. Prereq: 321.


476 Transport Phenomena in Living and Life Support Systems (3) Application of mass, momentum and heat transfer to design and optimize bioreactors. Prereq: 424 or consent of instructor. May be repeated. Maximum 6 hrs.

484-95 Special Engineering Science Topics (1-3,1-3) Problems related to recent developments and practice. Open to juniors or seniors. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

523 Theory of Elasticity (3) Equations of equilibrium, strain-displacement relations compatibility, and constitutive equations in three-dimensions. Beams, discs, thick-walled tubes, plates with holes; stress concentrations. Airy and complex potential stress function, plane stress and plane strain in rectangular and polar coordinates. Thermal stresses in beams, rings, plates, and shells; thermal buckling problems.


528 Ceramic Matrix Composites: Material and Mechanics (3) Matrix materials, microstructure and microstructural design; fabrication of ceramic matrix composites, interface characterization and mechanics; electron microscopy examination, nondestructive evaluation; fracture, fatigue, and fracture toughness. Prereq: 459 or consent of instructor (Same as Materials Science and Engineering 528.)


538 Advanced Engineering Acoustics (3) Introduction to theory and application of acoustic analysis; vibration of continuous systems; plane and spherical waves, transmission phenomena, reflection, diffraction and scattering. Resonators, filters, absorption mechanisms, microphones, ultrasonic, sonar transducers. Prereq: 435 or undergraduate vibrations course.

539 Continuum Mechanics (3) Cartesians tensors, transformation laws, field equations, mechanics concepts; stress, strain, deformation, constitutive equations. Conservation laws for mass, momentum, energy. Applications in solid and fluid mechanics.

541 Fluid Dynamics I (3) Kinetic; kinematic and thermodynamic properties of fluids. Development of rate deformation laws; mass, momentum and energy conservation relationships; non-dimensionalization. Applications of Euler and Navier-Stokes equations: exact solutions, potential flow, transonic, boundary layer approximations; coupled heat/mass transfer models. Coreq: 539.

542 Fluid Dynamics II (3) Development of basic concepts and governing equations for turbulence and turbulent field motion. Formulation for correlation function, energy spectrum, diffusion, turbulence, turbulent transport processes, free turbulence, wall turbulence; use of engineering turbulence closure models; examination of modern numerical and experimental methods. Prereq: 541.

557 Computational Mechanics Seminar (1) Current developments in computational fluid/thermal/structural mechanics. For departmental thesis students only. May be repeated.

562 Experimental Mechanics of Composite Materials (3) Stress-strain relationships for orthotropic and transversely isotropic materials; analysis of composite lamina and laminate; stress and strain transformation; lamina plate theory; fiber, matrix, fiber-matrix interface, and composite mechanical properties (tenaxile, flexure, compressive, shear); physical properties; notch-tip stress field, stress intensity factor, notch sensitivity; strain energy release rate, composite fracture toughness; failure modes. Lab. Prereq: Mechanical and Aerospace Engineering and Engineering Science 521 or consent of instructor. (Same as Materials Science and Engineering 562.)

564 Laser Processing of Materials (3) Physics and engineering associated with laser processing of metals and composites. Physics: lasers, optics, plasmas, heat transfer, plasma, welding, cutting, drilling, ablation, laser-induced material transport processes; laser welding, physical metallurgy of welding, theories of segregation and porosity formation, chilling, cutting, drilling, ablation, laser-induced material transport processes; thermal process engineering and hardening. Residual stresses, plasma character and diagnostics and applications to process utilization.

566 Optical Engineering I (4) Wave optics; scalar diffraction theory, introduction to Fourier optics; ray or geometric optics; thin mirror, gratings, paraxial methods, introduction to aberrations.

568 Optical Engineering II (4) Statistical optics; spontaneous and induced emission; black and gray body radiation, incoherent, partial and totally coherent radiation; mutual coherence function, detectors, radiometry. Prereq: 566.

571 Biomechanics of Hard and Soft Tissue (3) Introduction to terminology, physiology, and analytical methods for mechanics of living tissue. Continuum mechanics analysis of the bioelasto-plastic and fluid flow behavior of living tissue. Flow properties of blood, rheology of blood in microvessels; viscoelasticity of fluids and solids, mechanical properties of body fluids; vessel, skeletal; heart and smooth muscle; bone and cartilage. Research paper.


578 Fuzzy Systems in Engineering (3) (Same as Nuclear Engineering 578.)

581 Special Topics in Engineering Mechanics (3) Mechanics problems related to recent developments. Prereq: Consent of instructor. May be repeated with consent of department.

585 Industrial Pollution Prevention (3) (Same as Chemical Engineering 581 and Environmental Engineering 581.)

589 Measurement Science II (3) (Same as Nuclear Engineering 589 and Aviation Systems 589.)

621 Analysis and Design of Thin Shell Structures (3) Geometry of surfaces, derivation of thin shell theory for arbitrary shell geometry; applications of theory to structural engineering. Prereq: 525 or Civil Engineering 562.

624 Viscoelasticity (3) Viscoelastic constitutive relations; ideal/thermal boundary value problems; wave propagation in viscoelastic/mekaoelastic media; stability problems; determination of viscoelastic properties. Prereq: 523 and 539 or Polymer Engineering 541.

625 Computational Plasticity and Creep Theory (3) and numerical algorithms used to describe plastic and creep behavior in finite element structural models. Perfect plasticity, kinematic and isotropic hardening; Mroz, mechanical sublayer, and two-surface models; visco-plasticity models; traditional creep models and unified creep-plasticity models. Numerical algorithms, including error maps, and plane stress plasticity algorithms in parallel. Prereq: 529 or 523, Mechanical and Aerospace Engineering and Engineering Science 525.


641 Advanced Topics in Fluid Mechanics and Convegetive Heat Transfer (3) Convective momentum, heat and mass transfer; boundary layer analysis, stability, transition, turbulence, closure models; Navier-Stokes equations, closure procedures: time- and ensemble-averaged, large scale structures; high speed flow, reacting, nonreacting, excitation, ionization. Applications in propulsion, lasers, aerodynamics. Prereq: 542.

646 Theory of Turbulence (3) Mathematical descriptions of turbulence; isotropic and anisotropic turbulence, energy spectra, Kolmogorov's hypothesis, large and small eddy structure for turbulent flows; turbulent diffusion by continuous movement; applications to turbulent jets, wakes, pipe and boundary layers. Prereq: 542, (Same as Aerospace Engineering 546.)

657 Computational Mechanics Seminar (1) Current developments in computational fluid/thermal/structural mechanics. For departmental thesis students only. May be repeated.

661 Advanced Topics in Engineering Mechanics (3) Advanced problems in mechanics, group or individually. Prereq: Consent of instructor. May be repeated with consent of department.


692 Mechanical Engineering Seminar (1) (Same as Honors and Honors Seminar 692.) Design and analysis of mechanical systems. Advanced problems in mechanical systems. Participation in team design effort; design report. Prereq: 332, 344. F

693 Thermal Engineering Seminar (1) (Same as Honors and Honors Seminar 693.) Application of strength and properties of materials, design factors, theories of failure to design of machine elements. Machine design experiences. Prereq: Materials Science and Engineering 201, Engineering Science and Mechanics 321, F, Sp


713 Phase Change Heat Transfer (3) Mechanisms and modeling of nucleate, transition, and film boiling processes; critical heat flux; forced convection boiling and condensation; heterogeneous nucleation; dropwise and filmwise condensation; phase change processes, moving phase fronts; mathematical modeling. Prereq: 544, 511.
Mechanical and Aerospace Engineering and Engineering Science

GRADUATE COURSES

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

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

521-22 Advanced Strength of Materials (3,3) Three-dimensional transformations for stress and strain, elementary theory of elasticity, asymmetrical bending, beams on elastic foundation, energy methods, shear center, beam-columns, thick-walled pressure vessels, elementary theory of plates. Prereq: Mechanics of Materials II or Mechanical Engineering 466, Mathematics 431 or Engineering Analysis.


560 Computational Mechanics Laboratory (1) Utilization of networked X-terminals/engineering work-station environment for conducting computational mechanics experiments. May be taken for credit with each of courses 551, 552, 553, and 557. Coreq: 551.

575 Applied Artificial Intelligence (3) (Same as Nuclear Engineering 575.)

576 Expert Systems in Engineering (3) (Same as Nuclear Engineering 576.)

577 Neural Networks in Engineering (3) (Same as Nuclear Engineering 577.)

580 Measurement Science (1) (Same as Nuclear Engineering 588, Aviation Systems 588, Civil Engineering 588.)

595 Seminar (1) All phases of mechanical and aerospace engineering and engineering science, reports on current research at UTK and UT ISI. May be repeated. S/N only. E

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

651-52 Advanced Topics in Computational Fluid Dynamics (3,3) Approximation theory; analysis of accuracy, convergence, and stability for smooth and non-smooth solutions; shocks, artificial dissipation, two- and three-dimensional, compressible viscous and inviscid flow through theory, turbine engine analysis of two-phase performance, homogeneous and heterogeneous propulsionsystems. Prereq: Consent of instructor.

526 Combustion and Chemically Reacting Flows II (3) Advanced topics: phenomenological approaches to turbulent flames; fundamentals of turbulent flow; application of probability density functions to turbulent flames; turbulent reacting flows with premixed and non-premixed reactants; spray combustion models; fluidized bed combustion; chemically reacting boundary layer flow; gas turbine combustion; combustion design; introduction to supersonic combustion and hypersonic flows. Prereq: 525.


551-52 Advanced Topics in Solid Mechanics (3) Advanced topics: phenomenological approaches to turbulent flames; fundamentals of turbulent flow; application of probability density functions to turbulent flames; turbulent reacting flows with premixed and non-premixed reactants; spray combustion models; fluidized bed combustion; chemically reacting boundary layer flow; gas turbine combustion; combustion design; introduction to supersonic combustion and hypersonic flows. Prereq: 525.


S21-22 Thermodynamics I and II (3,3) Macroscopic thermodynamics, including First and Second Law analyses, available energy, chemical reactions, equilibrium criteria, combustion, gas mixtures, and properties relations, determination of thermodynamic properties from molecular structure, spectroscopic data, kinetic theory, statistical mechanics, quantum mechanics, Schrodinger equation. Prereq: 332.


820 Rocket Propulsion I (3) Rocket propulsion fundamentals; thermodynamics of nonequating and chemically reacting ideal gases, rocket nozzle design; ideal rocket performance parameters; rocket heat transfer; chemistry of propellants; liquid rocket engine systems; ground testing; introduction to solid propellant rockets. Prereq: Consent of instructor.

588 Mechanics and Control of Robot Manipulators (3) Fundamentals of robot manipulation; kinematics and dynamics of manipulator arms, controller design for industrial robots, trajectory planning, compliant motion control and force control. Prereq: Matrix Computations, undergraduate dynamics and controls.


592 Selected Engineering Problems (2-6) Enrollment limited to students in the Junior year. Prereq: Consent of advisor. May be repeated. S/N only.

599 Special Topics in Mechanical Engineering (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. Prereq: Consent of instructor.

611 Advanced Convection Heat Transfer, Fluid Mechanics and Mass Transfer (3) Stagnation point and high speed viscous boundary layer flows; problems in heat transfer at high supersonic and hypersonic speeds; laminar and turbulent boundary layer heat transfer with surface heating, state of the art, effects of free-stream properties and temperature profiles on heat transfer. Lefler's integral solution for high speed boundary layers; heat flux scaling rules; mass transfer and radiation conjugate techniques. Prereq: 512 and consent of instructor.


613 Advanced Radiation Heat Transfer (3) Radiation heat transfer in absorbing, emitting and scattering media; interaction of thermal radiation with conduction and convection heat transfer. Prereq: 511, 512.

621 Advanced Topics in Solid Mechanics (3) Advanced theory and applications in mechanics, dynamics, vibrations, control, and finite element; Consent of instructor. May be repeated. Maximum 6 hrs.

622 Advanced Topics in Thermodynamics (3) Comparison of macroscopic and microscopic approach; equilibrium of pure substances, metastable states. Non- equilibrium thermodynamics. Prereq: Consent of Instructor.


526 Combustion and Chemically Reacting Flows I (3) Fundamentals: chemical kinetics and conservation equations; phenomenological approach to laminar flames; diffusion and premixed flame theory; single droplet combustion; deflagration and detonation theory; stabilization of combustion waves in laminar streams; laminar diffusion flames; introduction to turbulent flames. Prereq: 522, 531, or consent of instructor.

523 Special Topics in Thermodynamics (3) Application of thermodynamics to topics of current interest in mechanical engineering. Prereq: Consent of instructor.

525 Combustion and Chemically Reacting Flows I (3) Fundamentals: chemical kinetics and conservation equations; phenomenological approach to laminar flames; diffusion and premixed flame theory; single droplet combustion; deflagration and detonation theory; stabilization of combustion waves in laminar streams; laminar diffusion flames; introduction to turbulent flames. Prereq: 522, 531, or consent of instructor.

Mechanical and Aerospace Engineering and Engineering Science
ADMISSION REQUIREMENTS

Students are expected to have completed an undergraduate program with a 3.0 or better GPA on a 4.0 system. Included in the undergraduate course work should be (1) a full year of general biological science, (2) one year of calculus, (3) two years of chemistry, including one year of organic, (4) one year of physics, and (5) an introductory course in microbiology. In many cases, deficiencies in this program may be removed by taking appropriate courses during the first year of graduate study. The department also requires the student to have had the following: (1) an introductory course in microbiology, and (2) a course in statistics. Prerequisites: (1) an introductory course in microbiology, and (2) a course in statistics. The program leading to the Ph.D. is designed to develop the student's ability to pursue independent and original research in microbiology and adjacent fields, to teach both oral and written communication of the results of research to the scientific community, and to train effective teachers. Students may enter the program after receiving either a bachelor's or master's degree. Students who enter with a master's degree usually take four or five years to complete the degree. Departmental requirements are: (1) a 3.0 GPA in all courses taken for graduate credit after 12 hours of credit have been earned in courses graded on the A-F scale; (2) a 3.0 GPA in courses taken in the department; (3) satisfactory performance in at least one semester as a teaching assistant; (4) one semester of physical chemistry; (5) one course in statistics; (6) two semesters of biochemistry or molecular biology; (7) satisfactory performance in a comprehensive examination that must be attempted before the end of the fifth semester in the program and passed before admission to candidacy; and (8) the presentation of a research dissertation and its oral defense.

GRADUATE COURSES

410 Bacterial Physiology (3) Modern concepts of structure and function of bacterial cell. Prereq: Introduction to Microbiology. F
411 Bacterial Genetics (3) Transmission and expression of genetic information by bacteria. Prereq: Introduction to Microbiology. Sp
420 Medical Microbiology (3) Disease-producing microorganisms, including bacteria, rickettsiae, chlamydia and fungi. Prereq: Introduction to Microbiology. Sp
429 Medical Microbiology Laboratory (2) Laboratory exercises designed to accompany 420. Prereq: Introduction to Microbiology Laboratory. Coreq: 420. Sp
430 Immunology (3) Principles of inflammation and immunity; immunoglobulin structure and function; normal and abnormal immunological responses; cell cooperation and recognition of immune mechanisms; soluble factors. Prereq: Biology 220. (Same as Biochemistry and Molecular Biology 436.) F
439 Immunology Laboratory (2) Laboratory exercises designed to accompany 439. Coreq: 439. (Same as Biochemistry and Molecular Biology 439.) F
449 Virology Laboratory (1) Laboratory procedures for isolation, handling, and culturing of animal viruses. Prereq: 440. Coreq: 449. Sp
470 Microbial Ecology (3) Physiological diversity and taxonomy of microorganisms from natural environments. Functional role of microorganisms in natural and simulated ecosystems. Prereq: 310. F
500 Thesis (1-15) P/NP only. E
503 Supervised Fieldwork (1-15) Prereq: 310. F/NP only. E
557 Applied Microbiology and Bioengineering (3) (Same as Chemical Engineering 575, Environmental Engineering 575, and Agricultural Engineering 575.) F
591 Foreign Study (1-15) See College of Arts and Sciences.
592 Off-Campus Study (1-15) See College of Arts and Sciences.
593 Independent Study (1-15) See College of Arts and Sciences.
595 General Seminar (1) Lectures and seminars by invited speakers, faculty, and graduate students. May be repeated. Maximum 18 hrs. S/N only. E
596 Laboratory Rotation (1) Familiarization with research areas in the department through series of rotations in laboratories of individual faculty members. May be repeated. Maximum 3 hrs. S/N only. E
600 Doctoral Research and Dissertation (3-15) P/NP only. E
601 Journal Club in Microbial Physiology (1) Readings and discussions on current literature. May be repeated. Maximum 18 hrs. S/N only. E
602 Journal Club in Microbial Pathogenesis (1) Readings and discussions on current literature. May be repeated. Maximum 18 hrs. S/N only. E
603 Journal Club in Immunology (1) Readings and discussions on current literature. May be repeated. Maximum 18 hrs. S/N only. E
604 Journal Club in Virology (1) Readings and discussions on current literature. May be repeated. Maximum 18 hrs. S/N only. E

Microbiology

The Department of Microbiology offers both the M.S. and Ph.D. Students have the option of selecting from a variety of graduate research programs. For a departmental brochure, contact the department head.
Microbiology-Veterinary Medicine

See College of Veterinary Medicine and Comparative and Experimental Medicine

Music

(College of Arts and Sciences)

MAJOR

DEGREES

Music

Kenneth A. Keeling, Sr., Head

Professors:

Ball, Charles H., Ph.D. Peabody
Bitzas, George C., M.M. Converse
Brock, John P. (Liaison), M.M. Alabama
Carter, W. J. (Emeritus), D.M.A. Eastman
Coker, J. M. A. Sam Houston
Combs, F. M., A. Missouri
DeVeine, George F. (Emeritus), Schurz
Dorn, W. (Emeritus), M.A. Columbia
Fred, Herbert W. (Emeritus), Ph.D. North Carolina
Holford, A. G. (Emeritus), M.M. Northwestern
Jacobus, K. A., D.M.A. Texas
Jullian, W. J. (Emeritus), Ph.D. Northwestern
Keeling, Kenneth A., Sr., D.M.A. Catholic
McClelland, D. K., M.A. Columbia
MacMorran, W. S., M.M. Wisconsin
Machem, John J., M.M. Northwestern
Moore, M. C., Ph.D. Michigan
Northington, D. B., D.M.A. Yale
Pederson, D. M., Ph.D. Iowa
Starr, W. J. (Emeritus), M.M. Eastman
Stutzenberger, D. R., D.M.A. Maryland
Tipp, A. W., Ph.D. Michigan

Associate Professors:

Adams, Fay, M.M. Tennessee
Boling, M. E., M.M. Tennessee
Brown, Donald R., Hs.D. Tennessee
Carter, P. S., M.M. Colorado
Davis, Dolly C., M.M. Tennessee
Dubberty, T. S., D.M.A. Yale
Horodysky, P. M., M.M. Manhattan
Hough, Don, M.M. Tennessee
Johnson, A. E., D.M.A. Stanford
Leach, C. F., M.M. New Mexico
Mintz, J. O., Ed.D. Columbia
Searle, S. M., M.M. Tennessee
Sparks, J. R., M.S. Tennessee
Sperl, G. R., M.M. Indiana
Young, S. E., Ph.D. North Carolina

Assistant Professors:

Batey, A. L., D.M.A. South Carolina
Binder, S. L., M.M. Virginia Commonwealth
Brunell, D. E., D.M. Indiana
Ehrman, M. M., B. S. Northwestern
Hawthorne, W., Ph.D. Cincinnati
Murphy, B. A., Ph.D. Ohio State
Romines, J. M., M.M. Indiana
Schallert, G. T., D.A. Northern Colorado
Smith, C., B.M. SUNY-Fredonia
Wenzel, A. N., M.M. Southern California

The Department of Music offers the Master of Music degree with concentrations in accompanying, choral conducting, composition, instrumental conducting, jazz, music education, musicology, performance (organ, piano, strings, voice, winds, and percussion), piano pedagogy, and literature, sacred music, string pedagogy, and theory.

Applicants must have completed an undergraduate degree approximately equivalent in music requirements to those required in degrees conferred by UT Knoxville, appropriate to the applicant's prospective area of concentration on the master's level.

All concentrations require a written and oral examination in their respective areas. These examinations are given by the Department of Music at the beginning of each semester.

THE MASTER'S PROGRAM

A minimum of 30-33 semester hours of coursework is required for the Master of Music degree. These hours are specifically distributed according to the area of concentration. All concentrations require coursework in music history/literature and music theory and allow for elective courses. Specific curricula are available from the department.

The graduate recital is given in lieu of thesis by students with concentrations in performance, pedagogy, jazz, and accompanying. A performance project is given in lieu of thesis by students with concentrations in choral conducting, instrumental conducting, and sacred music. A thesis is required of students in composition, musicology, and theory.

All concentrations require a written and oral final examination.

Concentration in Music Education

The concentration in music education is designed for persons who hold a Bachelor's degree in Music or Music Education and certification to teach music in the public schools. Students seeking initial certification should consult the requirements for the Master of Science degree in the College of Education.

The program requires 510 and 520: 9 hours of music education electives at the 500 level; 6 hours of Thesis 500; 6 hours of 500-level courses in music theory or history; 2 hours of applied music at either the 400 or 500 level; 2 hours of music ensemble at the 500 level; and 3 hours of electives at the 500 level.

A three credit research problem and three extra hours coursework in Music Education may be substituted for Thesis. If a larger thesis problem is desired, the thesis credit may be increased to 9 hours, and 3 hours of Music Education electives may be dropped.

Diagnostic tests in theory, ear training, and music history will be required.

Music Education

GRADUATE COURSES

500 Thesis (1-15) P/R only: E

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

510 Foundations of Music Education (3) Historical, philosophical and aesthetic bases. Prereq: Consent of instructor.

520 Research in Music Education (3) Definition of research problems, data collection and analysis, and research report writing. Application of knowledge of research techniques to analysis of existing research literature in music education. Prereq: Consent of instructor.

530 Advanced Band Literature and Conducting (3) Reading, conducting, and interpreting band scores suitable for school, college, and community bands; contemporary and standard band literature. Prereq: Consent of instructor.


560 Psychology of Music Teaching (3) Research on musical perception and cognition and its application to teaching of music. Definition and measurement of musical ability. Prereq: Consent of musicology or 1 yr of music theory or consent of instructor.

560 Seminar in Music Education (3) Class investigation and individual reporting of pertinent topics and issues in music education. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

562 Special Topics in Music Education (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

563 Special Problems in Music Education (3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

Music Ensemble

GRADUATE COURSES

503 Small Jazz Ensemble (1) May be repeated. Maximum 12 hrs.

504 Jazz Ensemble (1) May be repeated.

505 Studio Orchestra (1) May be repeated. Maximum 12 hrs.

506 Trombone Ensemble (1) May be repeated.

510 Percussion Ensemble (1) May be repeated.

511 Marimba Ensemble (1) May be repeated.

515 Chamber Music Ensemble (1) May be repeated. Maximum 12 hrs.
Music General

GRADUATE COURSES

500 Thesis (1-15) P/NP only. E
501 Graduate Recital (2) E
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E
511 Lecture Recital (2) E
521 Special Topics in Performance (1-3) Prereq: Consent of department head. E
540 Secondary Applied Music (1) May be taken by music majors desiring applied study on a 2nd or 3rd instrument. May be repeated for a maximum of 4 hours credit on each instrument. Admission by audition. Requires payment of Applied Music fee. E
561 Church Music Performance Project (1-2) May be repeated. Maximum 3 hrs. E

Music History

GRADUATE COURSES

410 Music History Genre (3) Topics vary. May be repeated. Maximum 6 hrs.
420 History of Opera (3) Dramatic, vocal, and orchestral elements in opera of Italian, French, and German schools, 1900-present.
430 Symphonic Literature (3) Literature for orchestra from Baroque to present, evolution of symphony.
440 Music of North America (3) Folk and art music of U.S. and Canada from colonial times to present.
450 Composer Seminar (3) Life and works of single composer. Subjects vary.
460 Music Aesthetics (3) Nature of music and musical experience, sense perception and emotions, music and role of artist in society. Aesthetic viewpoint of individuals and historical eras through selected writings.
480 Music in Christian Worship (3) Hymnody, liturgies, and liturgical music.
490 Church Music Methods and Administration (3)
510 Music Bibliography (2) Bibliographic methodology in music. F
520 Music Research (1) Principles of research methodology applied to writing of research proposal and project.
530 Music in the Middle Ages (3) Gregorian and medieval chant, secular monophony, and rise of polyphony.
540 Music in the Renaissance (3) From 1400 to 1600. Mass, motet, chansons, madrigal, and other vocal and instrumental forms and genres.
550 Music in the Baroque Period (3) From c.1600 to 1750; rise of opera and oratorio, sacred and secular cantatas, instrumental forms, performance practice.
560 Music in the Classic Period (3) Evolution of classical style from pre-classic music to music of Haydn, Mozart, and early Beethoven.
570 Music in the Romantic Period (3) Nineteenth-century musical styles from Beethoven to post-romanticists.
580 Music in the Twentieth Century (3) From 1890, Debussy, to present, Stockhausen and others.
590 World Music (3) Attitudes and techniques of ethnomusicology. Survey of world music cultures, interviews and transcription projects.
593 Independent Study (1-15) See College of Arts and Sciences. Prereq: Consent of department head.

Music Instrumental

GRADUATE COURSES

480 Piano (1-4)
479 Guitar (1-4)
470 Cello (1-4)
465 Viola (1-4)
450 Oboe (1-4)
445 Tuba (1-4)
440 Baritone (1-4)
435 Trombone (1-4)
430 Trumpet (1-4)
425 Horn (1-4)
420 Saxophone (1-4)
415 Clarinet (1-4)
410 Bassoon (1-4)
405 Oboe (1-4)
403 Flute (1-4)
406 Oboe (1-4)
410 Bassoon (1-4)
415 Clarinet (1-4)
420 Saxophone (1-4)
425 Horn (1-4)
430 Trumpet (1-4)
435 Trombone (1-4)
440 Baritone (1-4)
445 Tuba (1-4)
450 Percussion (1-4)
455 Voice (1-4)
460 Violin (1-4)
465 Viola (1-4)
470 Cello (1-4)
475 String Bass (1-4)
476 Electric Bass (1-4)
479 Guitar (1-4)
480 Piano (1-4)
485 Harpsichord (1-4)
480 Organ (1-4)
490 Improvisation (1-3)
495 Composition with Electronic Media (1-3)
496 Composition for Media (2)
499 Improvisation (1-2) May not be used toward applied music requirement.
503 Flute (1-4)
505 Oboe (1-4)
510 Bassoon (1-4)
515 Clarinet (1-4)
520 Saxophone (1-4)
525 Horn (1-4)
530 Trumpet (1-4)
535 Trombone (1-4)
540 Baritone (1-4)
545 Tuba (1-4)
546-95 Suzuki Piano Method I,II (2,2) Psychology, procedures, and literature of Suzuki piano method. Must be taken in sequence. Prereq: Consent of instructor.
520 Piano Literature Seminar (3) Topics vary. May be repeated. Maximum 6 hrs.
531-41 Recital Project (2,2) Preparation and accomplishment of full recital for accompanying concentrations only. 531--Vocal recital, 541--Instrumental recital. Prereq: Consent of instructor.
540-50 Advanced Piano Pedagogy I,II (2,2) Evaluation and study of methods and materials for teaching piano at all levels. Supervised laboratory teaching. Prereq: 440, 450, or consent of instructor. 550--Introduction and principles of Kodaly, Orff, Suzuki, Dalcroze Eurhythmics, and class piano teaching. Prereq: 440, 450 or consent of instructor.
550 Organ Literature Seminar (3) Topics vary. May be repeated. Maximum 6 hrs.

Music Performance

GRADUATE COURSES

All performance courses require an audition and consent of instructor. May be repeated. Maximum 8 hrs toward M.M. degree.
403 Flute (1-4)
406 Oboe (1-4)
410 Bassoon (1-4)
415 Clarinet (1-4)
420 Saxophone (1-4)
425 Horn (1-4)
430 Trumpet (1-4)
435 Trombone (1-4)
440 Baritone (1-4)
445 Tuba (1-4)
450 Percussion (1-4)
455 Voice (1-4)
460 Violin (1-4)
465 Viola (1-4)
470 Cello (1-4)
475 String Bass (1-4)
476 Electric Bass (1-4)
479 Guitar (1-4)
480 Piano (1-4)
485 Harpsichord (1-4)
480 Organ (1-4)
490 Improvisation (1-3)
495 Composition with Electronic Media (1-3)
496 Composition for Media (2)
499 Improvisation (1-2) May not be used toward applied music requirement.
503 Flute (1-4)
505 Oboe (1-4)
510 Bassoon (1-4)
515 Clarinet (1-4)
520 Saxophone (1-4)
525 Horn (1-4)
530 Trumpet (1-4)
535 Trombone (1-4)
540 Baritone (1-4)
545 Tuba (1-4)
teaching, analysis of vocal problems in selected students, and supervised teaching.

570 Vocal Chamber Music Performance (2) Prereq: Consent of instructor.

580-05 Choral Literature II, I, I (2, 2) Choral music from middle ages to present with consideration of historical development of major choral genres.

590 Advanced Choral Conducting (3) Expansions and development of conducting technique, development of choral rehearsal skills. Prereq: Consent of instructor.

594 Project in Choral Conducting Performance (1-3) Public performance, critical document: recording project. Prereq: Consent of instructor. May be repeated.

595 Choral Conducting Seminar (3) Score reading and preparation: problems of interpretation, performance practices, and conducting techniques. Prereq: 590 or consent of instructor. May be repeated.

Nuclear Engineering

(College of Engineering)

MAJOR DEGREES

Nuclear Engineering M.S., Ph.D.

Thomas W. Kerlin, Head

Professors:

Dodd, H. L., PE, Ph.D. Tennessee
Kerlin, T. W. (Liaison), Ph.D. Tennessee
Mihalczuk, J. T., Ph.D. Tennessee
Miller, L. F., PE, Ph.D. Texas A&M
Shannon, T. E., Ph.D. Tennessee
Uhrig, R. E. (Distinguished Prof.), PE, Ph.D.
Upadhaya, B. R., Ph.D. California

Associate Professors:

Grog, P. G., Ph.D. Vienna
Katz, E. M., Ph.D. Tennessee
Peyve, R. E., Ph.D. Tennessee
Ruggles, A. E., Ph.D. Rensselaer
Scott, T. H., PE, Ph.D. Florida
Townsend, L. W., Ph.D. Idaho

Assistant Professor:

Hines, J. W., Ph.D. Ohio State

The Department of Nuclear Engineering offers programs leading to the Master of Science and Doctor of Philosophy degrees. Students may elect a traditional nuclear engineering M.S. or Ph.D. program (focusing on fission energy or fusion energy) or a radiological engineering concentration at the master's level. The radiological engineering concentration prepares students for careers in the radiation safety field (health physics). The program is designed for graduates of undergraduate programs in engineering, physics, biology, and chemistry.

All entering students must have, as a minimum, competency in mathematics through ordinary differential equations, competency in atomic and nuclear physics, and competency consistent with a course in introductory nuclear engineering. If these competencies do not exist, the student must take appropriate courses for undergraduate credit. The department head is the contact for all interested students, both those with nuclear engineering degrees and those from other disciplines.

THE MASTER'S PROGRAM

A graduate program leading to the Master of Science is available to graduates of recognized undergraduate curricula in engineering and physics. Each applicant will be advised as to the necessary prerequisite courses before he/she enters the program.

The student must complete 24 semester hours of coursework approved by the student's advisory committee that includes the following:

1. A major consisting of a minimum of 12 semester hours of graduate courses in nuclear engineering. This must include at least one of the following sequences: 511, 512; 551, 552; 571, 572.

2. A minor of 6 semester hours of elective courses in mathematics, statistics or computer science.

3. Six semester hours in either nuclear engineering or a related field.

The M.S. candidate must also demonstrate research or design capability. This requirement may be satisfied by a thesis project or engineering practice projects as described below:

Thesis - The student performs independent research on a topic approved by the graduate committee. He/she submits a thesis to the research advisor. The student must then pass an oral examination on the thesis and all graduate coursework. The student must enroll for six semester hours of NE 500 (Thesis).

Engineering Practice - The student performs independent research on a topic of two to four separate topics approved by his/her graduate committee. Each project is similar to a thesis project but smaller in scope. He/she submits a report, in thesis format, on each project. The student must then pass an oral examination on his/her engineering practice reports and all graduate coursework. The student must enroll for six semester hours of NE 598 (Nuclear Engineering Practice).

THE DOCTORAL PROGRAM

Students in the field of nuclear engineering desiring to study for the Doctor of Philosophy must have a Bachelor of Science or Master of Science from a recognized university, with a major in engineering or physics. All candidates will be required to demonstrate general competence in a comprehensive examination in the areas of engineering science, mathematics, physics, and nuclear engineering.

Specific course requirements for the Ph.D. in Nuclear Engineering include:

1. A minimum of 48 semester hours beyond the Bachelor's degree, exclusive of credit for the M.S. thesis or Nuclear Engineering Practice.

2. A minimum of 24 semester hours in doctoral research.

3. A minimum of 30 semester hours in nuclear engineering courses numbered 500 and above (or the equivalent), with at least 9 semester hours of 600-level courses. These are exclusive of thesis or dissertation credit.

4. A minimum of 12 semester hours in mathematics, computer science, or statistics courses beyond nuclear engineering undergraduate requirements numbered 400 or above.

5. A minimum of 6 semester hours in courses numbered 500 or above from a
department other than nuclear engineering. The choice depends on the student's overall program and should expand his/her knowledge in a given field.

A reading knowledge of one foreign language may be specified by the student's doctoral committee.

The comprehensive examination is prepared by the nuclear engineering faculty and consists of 12 hours of written examinations. All past examinations are filed in the library, and students are encouraged to review them. Students are invited to take the comprehensive examination after completing approximately 30 semester hours of coursework. A student who fails the written part of the examination must take and pass the examination the next time it is offered to remain in the Ph.D. program.

Registration for NE 600 is not permitted until the written examination is passed. The comprehensive examination is completed with a successful oral defense of the dissertation proposal. A candidate must successfully defend, in an oral examination, all work presented for the degree—all coursework and the dissertation.

ACADEMIC COMMON MARKET
An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The Ph.D. program in Nuclear Engineering is available to residents of the states of Alabama, Kentucky, or Mississippi. The M.S. program is available to residents of the states of South Carolina, Virginia and others.

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

GRADUATE CREDIT FOR UNDERGRADUATE COURSES
400-level courses in nuclear engineering may be used for graduate credit. However, students must recognize that at least two-thirds of the minimum required hours (30) in a master's degree program must be taken in courses numbered 500 or above.

GRADUATE COURSES
403 Nuclear Engineering Laboratory (3) Cross-section measurement, diffusion properties of neutrons, critical loading experiment, control rod calibration, statistical weight, shielding, xenon poisoning, dynamics and controls experiments. Prereq: Nuclear Engineering Laboratory or equivalent. Coreq: 471, 496.


405 Reactor Dynamics, Control and Safety (3) Reactor models, transient analysis, safety analysis, control systems and safety systems. Prereq: 470.

406 Radiation Shielding (3) Types of radiation sources, fundamentals of gamma ray and neutron attenuation, biological effects, approximate methods of shield design, discrete ordinates, and Monte Carlo. Prereq: Physics 232.

412 Introduction to Nuclear Criticality Safety (3) Fundamentals of nuclear criticality safety; criticality accidents; safety standards; overview of experiments, computational methods, and instrumentation. Prereq: Introduction to Nuclear Engineering.


432 Radiation Risk Analysis (3) Radiation risk estimates for external and internal radiation, dose-response models, dose rate effects, prediction of radiation risks, radiation safety standards.


463 Introduction to Fusion Energy I (3) Same as Electrical Engineering 463.

464 Introduction to Fusion Energy II (3) Same as Electrical Engineering 464.

470 Nuclear Reactor Theory I (3) Fundamentals of reactor physics relative to cross sections, kinematics of elastic scattering, reactor kinetics, reactor systems and nuclear data. Analytical and numerical methods applied to reactor core design: equations that relate thermal and neutron variables; power distribution calculations and reactivity control methods. Prereq: 470.

471 Nuclear Reactor Theory II (3) Thermal spectrum computational methods: heterogeneous effects in fast and thermal spectra; critical core design: equations that relate thermal and neutron variables; power distribution calculations and reactivity control methods. Prereq: 471.

472 Selected Topics in Nuclear Criticality Safety (3) Topics related to reactor safety and safeguards. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

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

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

511-12 Transport Processes in Nuclear Engineering (3.3) Rheology of Newtonian and non-Newtonian fluids; integral and system conservation equations for single and multi-component fluids; in-depth development of boundary layer analysis; numerical analysis of fluid flow and heat transfer.

521 Nuclear Systems Dynamics and Control (3) Introduction to state variable systems, control systems and control analysis and application of these methods to nuclear plant dynamics, simulation and control problems.

522 Experimental Methods in Reactor Dynamics (3) Introduction to time and frequency analysis techniques, numerical analysis of fluid flow and heat transfer.

541 Reactor Fuel Management (3) Topics relative to fuel management, applicable topics in reactor physics, fuel depletion, isotopic inventories, reactivity control and numerical methods. Prereq: 401.

542 Management of Radioactive Materials (3) Technologies for processing, treatment, handling and storage of radioactive material; advanced methods for environmental impact of radioactive materials. Licensing and regulation issues.

543 Selected Topics in Nuclear Criticality Safety (3) Criticality safety computational and experimental methods for enchainment, fabrication, storage, reprocessing, and transportation of materials. Prereq: 421 or consent of instructor.

551 Radiation Protection (3) Interactions of photons, neutrons, beta particles, and heavy charged particles with matter and mechanisms of energy loss; methods of radiation detection, internal and external radiation dosimetry, chemical and biological effects of radiation; regulations and standards. Prereq: Introduction to Nuclear Engineering and Differential Equations I or equivalents.

552 Radiation Monitoring and Dose Assessment (3) Methods for work area and environmental monitoring; dose assessment; pathways analysis; risk projections and regulations. Prereq: 551.

561 Plasma Diagnostics I (3) Same as Electrical Engineering 561.

571 Reactor Theory and Design (3) Analytical and numerical techniques for neutronics modeling of nuclear systems. Forward and adjoint Boltzmann transport equation, Multigroup diffusion theory, Core analysis methods and codes. Prereq: 401 or equivalent.

572 Nuclear System Design (3) Design and analysis of a nuclear system, interface with non-nuclear aspects of system design: system reliability and economics; class project. Prereq: 571 or consent of instructor.

575 Applied Artificial Intelligence (3) Symbolic methods for artificial intelligence systems with focus on application to engineering problems. Prereq: Consent of instructor. (Same as Mechanical and Aerospace Engineering 575)

576 Expert Systems in Engineering (3) Application of expert systems in engineering aimed at developing expert systems, programming, advanced topics. Prereq: 575 or consent of instructor. (Same as Mechanical and Aerospace Engineering 576).

577 Neural Networks in Engineering (3) Neural network technology for use in intelligent systems; rationale for neural computing, structure of neural systems, programming, Prereq: Consent of instructor. (Same as Mechanical and Aerospace Engineering 577).

581 Radiation Shielding (3) Application of analytic and deterministic solutions of Boltzmann transport equation to shield design problems. Spherical harmonics, moment methods, discrete ordinates, adjoint calculations, coupled analysis, and fast reactor shield design. Prereq: 406 or equivalent.

582 Monte Carlo (3) Analysis of radiation transport problems in radiation shielding by Monte Carlo method, determination of MORSE computer code. Prereq: Introduction to Nuclear Engineering or equivalent. Preregistration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. Maximum 6 hrs.

583 Monte Carlo (3) Application of radiation transport analysis to radiation shielding problems by Monte Carlo method. Determination of MORSE computer code and methods for evaluating integral, elemental, transport, and adjoint methods of analysis. Radiation shielding, and advanced modes of analysis. Prereq: 582 or equivalent. Preregistration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. Maximum 6 hrs.

585 Process System Reliability and Safety (3) Qualitative and quantitative techniques for assessing and improving process systems reliability and safety. Fault tree analysis and associated dependent failure analysis. (Same as Chemical Engineering 585).

588 Measurement Science II (3) Principles of measurement, introducing to measurement devices. Prereq: Consent of instructor. (Same as Mechanical and Aerospace Engineering 588).

589 Measurement Science I (3) Modern industrial measurement systems, advanced topics in measurement. Prereq: 588. (Same as Aviation Systems 589, and Mechanical Engineering 586).

598 Special Topics in Nuclear Engineering (3) Lectures and recitation on recent advances in nuclear engineering. Prereq: Consent of Instructor. May be repeated with consent of department.

599 Nuclear Engineering Practice (3-9) Experience in solving problems in nuclear engineering; Prereq: Approval of department. May be repeated. Enrolment limited to alternative plan students. S/N only.

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

611-12 Selected Topics in Reactor Theory (3) Selected topics from literature. Prereq: 572.
Nursing

(College of Nursing)

MAJOR DEGREE

Nursing ........................................... M.S.N., Ph.D.

Joan L. Creasia, Dean
Sandra Thomas, Director of Ph.D. Program
Martha Alligood, Director of MSN Program

Professors:
Alligood, Martha R. (Liaison), Ph.D. ... New York
Cresala, Joan L., Ph.D. ............... Maryland
Goodfellow, Dale H., Ph.D. . Peabody
Mozingo, Johnie N., Ph.D. ......... Walden
Pierce, Joan U., Ph.D. ......... Utah
Thomas, Sandra P., Ph.D. ........ Tennessee

Associate Professors:
Bowen, Sheila, Ph.D. ............... Tennessee
Davis, Mitzi, Ph.D. ................. Tennessee
Droppleman, Patricia G., Ph.D. .... Tennessee
Dyer, Theresa, Ed.D. ............... Tennessee
Fanske, Mildred M., Ph.D. ....... Vanderbilt
Jolly, Mary Lue, Ed.D. .......... Kentucky
McGuire, Sandra, Ed.D. ........ Tennessee
Modrin-McCarthy, Mary Anne, Ph.D. .... Tennessee
Smith, Helen, Ph.D. ............. Maryland
Tuck, Inez, Ph.D. ................ North Carolina (Greensboro)
Wallace, Debra C., Ph.D. .... South Carolina

Assistant Professors:
Brown, Allie J., M.S.N. ....... Alabama (Birmingham)
Conion, Kathleen P., M.S.N. .... SUNY (Buffalo)
Evans, Ginger W., M.S.N. ........ Tennessee
Evans, Maude M., M.S.N. ......... Tennessee
Fox, Marie X., M.S.N. ............. Texas Women's
Halton, Sally M., M.S.N. ........ Texas Women's
Kollar, Mary, Ph.D. ............... Tennessee
Pierce, Margaret, M.S.N. ........ Tennessee
Pullen, Lisa, Ph.D. .............. Mississippi State

THE MASTER'S PROGRAM

The College of Nursing offers the Master of Science in Nursing degree with concentrations in adult health nursing, family nurse practitioner, mental health nursing, nursing administration, and nursing of women and children.

Admission Requirements
1. Meet requirements for admission to The Graduate School.
2. Hold a Bachelor's degree in Nursing from a National League for Nursing accredited program or complete the equivalent of an upper division undergraduate major in nursing in addition to meeting all M.S.N. degree requirements.
3. Have an undergraduate GPA of 3.0 or higher or a GPA of 3.3 for courses in the undergraduate major.
4. Submit scores of the general portion of the Graduate Record Examination.
5. Submit Graduate Program Data Form.
6. Submit Graduate School Rating Forms from three individuals familiar with the applicant's current work performance or academic aptitude.
7. New students normally are admitted to the program only at the beginning of fall semester. However, under special circumstances and on a space available basis, a B.S.N. graduate may be admitted at the beginning of spring or summer terms in a temporary non-degree status. Applications for fall admission must be received by February 1.

Special Requirements
1. Each student must hold personal professional liability insurance.
2. Registered nurses must be licensed to practice nursing in Tennessee.
3. Each student must present proof of hepatitis B vaccination and rubella and rubella immunization or sufficient titer for immunity; TB status.
4. Each student must present evidence of current 2-person CPR certification.
5. Non-registered nurse students must have completed courses in chemistry, nutrition, microbiology, anatomy, and physiology plus 12 semester hours of behavioral science courses.

Thesis and Non-Thesis Options
The thesis option is available for interested students and is especially encouraged for those who are considering pursuit of doctoral degrees sometime in the future. Students who choose the non-thesis option must register for 580 Nursing Project or 582 Supervised Research.

Program Requirements
All students must complete a minimum of 36 semester hours distributed as follows:

Core (12 credits)
503-04 Advanced Clinical Reasoning I, II 6
510 Theoretical Foundations of Nursing 3
520 Advanced Practice Nursing and Health Delivery Systems 3

Research (9-12 credits)
--- Graduate level statistics course 3
501 Nursing Research: Methods, Design & Analysis 3
500 Thesis 6
580 OR 582 OR 582 Supervised Research 3

Elective (3 credits)--waived for those who choose thesis option 3

Registered nurses whose bachelor's degrees are not in nursing must have completed courses in chemistry, nutrition, microbiology, anatomy, and physiology plus 12 hours of behavioral science courses. They must also complete 305, 313, 332, 403 and 433 and complete or successfully challenge the following:

301 Clinical Pharmacology 3
304 Nursing Assessment and Health Promotion 5
306 Health Deviation Concepts I 3
316 Health Deviation Concepts II 4
330 Nursing of Adults 6
414 Community Mental Health Nursing 6
415 Family/Community Health Nursing 6
431 Nursing of Children 4

Final Examination Requirements
All students must successfully complete a final examination as required by The Graduate School. For thesis students, the examination will consist of an oral defense of the thesis as well as other written or oral questions designed to measure student mastery of the entire program of study. For non-thesis students, the written examination will cover the entire program of study and may, at the discretion of the student's committee, be followed by an oral examination.

Special Policies
1. If the clinical performance of any student for any course is found to be unsatisfactory, the student will receive a grade of "F" for the course.
2. If a student achieves a final grade of "D" or "F" for any required undergraduate or graduate nursing course, he or she will not be permitted to repeat the course and will be required to withdraw from the program.
3. If the clinical performance of any student is characterized by unethical, unprofessional or unsafe behavior, or behavior that places the client in jeopardy, the student will be required to withdraw from the program.

THE DOCTORAL PROGRAM

The College of Nursing offers a doctoral program leading to the Doctor of Philosophy degree with a major in Nursing. This is a unified program offered jointly with The University of Tennessee, Memphis, College of Nursing. Students may complete all or part of the program at either site. The dissertation must be completed in its entirety at one site.

The doctoral program prepares nursing scholars capable of integrating research, theory, and practice into their roles as researchers.
educators, and/or administrators. Specifically, the graduate of this program should be able to:
1. Analyze, test, refine, extend, and expand the theoretical basis of nursing practice.
2. Conduct nursing research that generates knowledge and advances nursing as a discipline.
3. Provide leadership as nurse researchers, educators, and/or administrators in current and emerging health care settings.
4. Collaborate with members of other disciplines in health-related research of mutual concern.
5. Analyze, develop, and recommend health care policy at various levels.

Admission Requirements
1. Meet requirements for admission to The Graduate School.
2. Hold a master's degree in nursing from a program accredited by the National League for Nursing. Some outstanding applicants who are prepared at the bachelor's level in nursing may be considered. In such cases, graduate level courses in nursing theory, concentration specialty, and/or research will be integrated into the formal program of doctoral degree requirements.
3. Have a minimum cumulative graduate grade-point average of 3.3 on a 4.0 scale for previous college work.
4. Have a cumulative score of at least 1000 on the verbal and quantitative sections of the Graduate Record Examination.
5. Have successfully completed a basic statistics course and graduate nursing theory and research courses prior to enrollment in nursing doctoral level courses.
6. Have TOEFL scores of at least 550 if native language is not English.
7. Complete Graduate Program Data Form, College of Nursing.
8. Submit Graduate School Rating Forms from three college level instructors and/or nurses and administrators who have supervised applicant's professional work.
9. Submit a sample of scholarly writing (e.g., thesis, published paper).
10. Submit an essay describing personal and professional aspirations.
11. Submit Graduate Application for Admission, academic transcript(s), Graduate Record Examination scores, and, if required, TOEFL scores to the Graduate School. Submit three Graduate School Rating Forms, sample of scholarly writing, and Graduate Program Data Form with essay to the Director of the PhD program prior to February 15.
12. Schedule a personal interview with the College of Nursing PhD Student Admissions Committee prior to March 15 of the year preceding Fall admission.

Program Requirements
The following courses are required for all students:

--- Electives

600 Dissertation 24
TOTAL 72

*Note: A minimum of 1 hour per semester must be taken for 4 semesters.

Possible cognate areas include, but are not limited to, anthropology, child and family studies, psychology, education, management, medical ethics, public health, social work, philosophy, and statistics.

Doctoral Committee
Early in the student's program, a nursing faculty advisor will be selected by the student in consultation with the program director. The student's comprehensive examination committee consists of the faculty teaching core courses and one representative from the cognate area. The student then selects the dissertation committee. Five faculty holding the rank of assistant professor or above comprise the committee, three of whom (including the chair) must be approved by the Graduate Council to direct doctoral dissertations. At least two members of the committee must be from an academic unit other than nursing.

Special Policies
1. A minimum of 6 graduate hours taken before acceptance into the doctoral program may be applied toward the degree.
2. Minimum grades of B in all nursing doctoral courses and a 3.0 cumulative GPA are required for continuation in the program.

MINOR IN GERONTOLOGY
Graduate students in the College of Nursing may pursue a specialized minor in gerontology. This interdepartmental/interdisciplinary minor gives the student an opportunity for combining the knowledge about aging in American society with his/her major concentration. Please refer to Human Ecology for specific requirements.

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

GRADUATE COURSES

500 Thesis (1-15) P/NP only. E
501 Nursing Research: Methods, Design, and Analysis (3) Basic principles of research process in application to clinical questions; critical evaluation of nursing and health-related research. Prereq or coreq: 510, graduate level statistics. F, Sp
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities for courses. Registration may be repeated. S/N only. E
503 Advanced Clinical Reasoning I (3) Principles of health promotion, education, and innovative strategies for achievement of wellness; health habits, psychological, and social dimensions of whole person as related to risks for lifestyle diseases. F
504 Advanced Clinical Reasoning II (3) Development of advanced clinical reasoning skills for assessment of client health status and needs; physiological and pathophysiological concepts as dimensions of whole person. Implication for therapeutic nursing interventions. Prereq or coreq: 503. F
505 Advanced Clinical Pharmacology (3) Pharmacological agents utilized to treat common, recurrent health problems; indications, contraindications, side and interactive effects of commonly prescribed drugs. Prereq: 301 or equivalent or consent of instructor. F
510 Theoretical Foundations of Nursing (3) Historical evolution of nursing science; nursing's metaparadigm and selected philosophies, conceptual models and theories as structures which guide critical thinking in analysis, reasoning, and decision making for advanced practice nursing. F, Sp
520 Advanced Practice Nursing and Health Delivery Systems (3) Nursing's role in dynamic health care system; health policy and organizational, social, ethical, political, economic and technological factors which impact advanced practice nursing and delivery of health care. Prereq: 501, 504. Coreq: 520. Didactic (2) and practicum (4). Sp
531 Adult Health Nursing II (Continuation of 530) Delivery, provision, and management of health care for adult groups and communities. Prereq: 530. Didactic (2) and practicum (4). F
540 Family Nurse Practitioner I (6) Nursing management and primary care of individuals and families with actual and potential acute health problems; clinical experience in role of family nurse practitioner providing advanced practice nursing care in a variety of settings. Prereq: 504. Prereq or coreq: 501. Coreq: 520. Didactic (2) and practicum (4) Sp
541 Family Nurse Practitioner II (6) Continuation of 540. Nursing management of chronic health problems of individuals and families in all developmental life stages; role refinement and exploration of major issues of family nurse practitioner; clinical experience in variety of settings. Prereq: 540. Didactic (2) and practicum (4). F
543 Nurse Practitioner (9) Exploration and application of holistic nursing concepts to nursing management of common and chronic health problems. Role refinement and exploration of major issues in delivery of holistic primary nursing care. Clinical experiences vary depending on student's intent to pursue certification as family or adult nurse practitioner. Prereq: 540 and one course in concentrated area. Didactic, P/NP only. E
550 Nursing of Women and Children I (6) Advanced practice nursing for women and children; clinical experience in role of nurse practitioner or clinical nurse specialist in variety of settings. Health promotion and nursing interventions for actual or potential health problems of women, children, and families. Prereq: 504. Prereq or coreq: 501. Coreq: 520. Didactic (2) and practicum (4) Sp
551 Nursing of Women and Children II (6) Continuation of 550. Role refinement of nurse practitioner or clinical nurse specialist in health maintenance and delivery of holistic care. Prereq: 550 and one course in concentrated area. Didactic, P/NP only. E
552 Parent Child Nursing Field Work and Seminar (5) Seminar and intensive clinical practicum designed to facilitate further development of specialized knowledge and skills utilized for advanced parent-child nursing practice. Prereq or coreq: 551. 1 hr and 4 labs. Sp
557 Nurse Midwifery Seminar I (1) Exploration of art and science of midwifery, nature and scope of midwifery practice, professional and ethical issues in advanced nursing practice. Prereq or coreq: 501. 10. F
558 Nurse Midwifery Seminar II (1) Exploration of psychological, developmental, and sociocultural theories as related to individual and family patterns of illness and wellness. Role of nurse-midwife in advanced prac-
Nurse Midwifery Seminar III (1) Exploration of state of science in nurse midwifery, innovative practice options, and related research problems in nurse-midwifery practice. Prereq: 570, 571. Coreq: 500, 580 or 582.

559 Mental Health Nursing I (6) Theories of advanced therapeutic interventions for clients experiencing actual and potential mental health problems: advanced practice nursing in specialty of mental health; clinical practice with clients of various ages in acute care and community settings. Prereq: 504. Prereq or coreq: 501, 510, Didactic (2) and practicum (4). Sp.

560 Mental Health Nursing II (6) Continuation of 559. Advanced practice nursing in community settings for families and groups with actual and potential mental health problems. Prereq: 560. Didactic (2) and practicum (4). F.

565 Teaching Practicum (1-4) Individually designed teaching experience in college laboratory teaching practice setting. Objectives to be developed collaboratively by student and faculty. Prereq or coreq: 564 and consent of instructor. S/NC or letter grade. Sp.

566 Educational Principles and Strategies (3) Exploration and analysis of selected education, curriculum; teaching-learning, measurement, and evaluation principles and theories and their application to instruction of undergraduate nursing students, staff development, and patient education. Prereq: Consent of instructor. Su.

577 Special Topics (1-3) Topic is determined by faculty and student interest. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E.

580 Nursing Project (3) Student-initiated scholarly project with faculty supervision. Review and critical evaluation of literature in specific area of advanced practice nursing, culminating in "state of the practice" paper. Prereq: Consent of instructor, first course in concentration. Su, F.

582 Supervised Research (3) Supervised research culminating in scholarly paper. Experiential learning of research process. Participation in on-going faculty research project by completing specified portion of project under faculty guidance. Prereq: Consent of instructor, 501, 510. May be repeated. Maximum 6 hrs. E.


591 Nursing Administration II (6) Continuation of 580. Utilization of human and financial resources, conflict resolution, and organizational decision making. Prereq: 580, 2 hrs and 4 labs. F.

593 Independent Study (1-3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E.

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

601-02 Theory Analysis and Construction I, II (3-3) A study of selected nursing theories and conceptual models. Prereq: 510 or equivalent or consent of instructor. F, Sp.

605-06 Nursing Research Seminar (2,2) Selected topics pertaining to dissertation proposal process; research experience and defense. Prereq: Completion of core courses. F, Sp.

607 Qualitative Nursing Research (3) Exploration and analysis of philosophical bases, theoretical implications, methods, and data analyses of qualitative nursing research. F.

608 Quantitative Nursing Research (3) Exploration and analysis of philosophical bases, theoretical implications, methods, and data analyses of quantitative nursing research. Prereq or coreq: Graduate level statistics course. F.

609 Research Practicum (1-3) Supervised individual or group research experience under guidance of faculty. Prereq: Consent of instructor. May be repeated. Maximum 12 hrs. S/NC or letter grade. E.

611 Advanced Nursing Seminar (2) Exploration of historical and current issues of interest to doctoral prepared nurses. F.

612 Health and Nursing Policy/Planning (3) Policies affecting health education and health policy and political considerations and research methodologies in nursing research with completion of study under faculty guidance. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. Sp.

613 Nursing Management of Complex Systems (3) Contemporary organizational and management theories and techniques needed for effective administrative leadership in nursing education, practice, research, and entrepreneurial settings. F.

614 Nurse Preceptorship (1) Individually designed practicum, field, or internship experiences in variety of administrative, educational, research, or clinical practice settings. Prereq: 501, 502. F.

620 Directed Research (3) Exploration of theoretical considerations and research methodologies in nursing research with completion of study under faculty guidance. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. Sp.

Nutrition

(College of Human Ecology)

MAJORS

DEGREES

Nutrition ............................................ M.S.
Foodservice and Lodging Administration .... M.S.
Human Ecology ........................................ Ph.D.

Michael B. Zemel, Head

Professors:

Beauchene, Roy E. (Emeritus), Ph.D. .............. Kansas State
Carruth, Betty Ruth, Ph.D. ....................... Missouri
Sachan, Dileep S., Ph.D. ........................ Illinois
Skinner, Jean D., Ph.D. ............................ Oregon State
Smith, John T. (Emeritus), Ph.D. ............. Missouri
Zemel, Michael (Liaison), Ph.D. .............. Wisconsin

Associate Professors:

Alam, Yousri, Ph.D. ............................... Tennessee
Bailey, James W., Ph.D. ........................ Iowa State
Brooks, M. D. (Memphis), M.S. ............. Alabama
Costello, Carol, Ph.D. .............................. Tennessee
Haughton, B., Ed.D. ............................ Columbia

Assistant Professors:

Bittle, Joyce (Memphis), Ph.D. ............... Tennessee
Chencharick, Judith (Memphis), M.S. ....... Maryland
McGrath, M. (Liaison), Ed.D. ............. Tennessee
Moustaid, Naima, Ph.D. ......................... Paris
Whelan, Jay, Ph.D. ...................... Penn State

Young, Katherine A., J.D. .............. California Western School of Law
Zemel, Paula, Ph.D. ..................... Wayne State

Instructor:

Jones, K., MBA ............................... East Texas State

Master of Science programs are available in Nutrition and in Foodservice and Lodging Administration. Within the Nutrition program, a student may choose a concentration in nutrition science or public health nutrition.

A graduate degree combined with an approved pre-professional practice experience (AP4) beyond the baccalaureate degree qualifies the graduate to apply to the Registration Examination to become a Registered Dietitian (R.D.). Students may request more information from the department about the AP4 program. Students may also select an interdisciplinary minor in gerontology.

ADMISSION REQUIREMENTS

A final file for review includes the Graduate School application, completed departmental application forms, Graduate Record Examination (GRE) scores for all applicants, and three Graduate School Rating Forms completed by individuals who can attest to the applicant's potential for graduate education. Forms may be obtained from the Department Office, 229 Jessie Harris Building, University of Tennessee, Knoxville, 37996-1900.

Admission into any of the graduate programs in the department is dependent on completion of undergraduate courses that give the necessary background for success in the graduate program. For programs in Nutrition, essential undergraduate courses include general and organic chemistry, physiological psychology, and statistics and advanced nutrition.

For the master's program in Foodservice and Lodging Administration, undergraduate courses in foodservice and lodging administration, quantity food production, cost control, marketing, and personnel development are essential. Applicants to all programs with related work experience may be given preference.

THE MASTER'S PROGRAM

Students may choose a thesis or non-thesis option in Nutrition or Foodservice and Lodging Administration. Attendance at HRA 537 (Foodservice and Lodging Administration) or NTR 640 (Nutrition) is required every semester.

Nutrition

Thesis Option: The program consists of a minimum of 33 hours with at least 16 hours of coursework in the department. NTR 511, 512, 540, 541 and 3 hours of AP4 beyond the baccalaureate degree are required. Students in public health nutrition must take NTR 511, 512, 513, 514, 515, 540 and the minor in public health. Six hours of Thesis 500, and 6 hours outside the department are required. A minimum of 22 hours at the 500 or 600 level is required.

An oral comprehensive examination is required upon completion of the thesis.

Non-Thesis Option: The program consists of a minimum of 36 hours with at least 20 hours of coursework in the department. NTR 511, 512, 540, 541, 2 hours from 542-544 and 3 hours of graduate level statistics are required. Students in public health nutrition must take NTR 511, 512, 513, 514, 515 and the minor in public health.
Nutrition

GRADUATE COURSES

414 Nutrient-Drug Interactions (2) Nutrient effects on efficacy and toxicity of drugs: drug effects on absorption and metabolism of nutrients. Prereq: Fundamentals of Nutrition or equivalent. Sp, A

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

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

508 Cultural, Food, and Nutrition (3) Food-related behavior of individuals and groups in United States. Sociocultural, economic, and technological influences. Nutrition and food surveys, public policy. Prereq: Nutrition for Educators or Advanced Nutrition or consent of instructor. F, A

509 Graduate Seminar in Public Health (1) Same as Public Health 509, Exercise Science 509, Nursing 509 and Social Work 509. F

511 Advanced Physiological Chemistry (4) Bioenergetics, flux control and hormonal interrelationships. Prereq: Advanced Nutrition or equivalent. F


513 Community Nutrition I (3) Orientation to community; assessment of nutrition problems, needs, and resources; functional roles of public health nutritionist. Prereq: Consent of instructor. F

514 Community Nutrition II (3) Planning, implementation, and evaluation of public health nutrition programs. Prereq: 513 or consent of instructor. Sp

515 Field Study in Community Nutrition (1-12) Personal participation in and analysis of state or regional community nutrition program. Location of in-depth study to be selected in consultation with instructor. Prereq: 513, 514 and consent of instructor. S/N only. Su

516 Maternal and Child Nutrition (3) Nutrition principles related to growth and development during pregnancy, infancy, and childhood to age 5. Prereq: Consent of instructor. F

517 Childhood and Adolescent Nutrition (3) Application of nutrition principles to school-age children; effects of disease on growth and development; nutritional assessment and counseling for nutrition. Prereq: Advanced Nutrition or consent of instructor. Sp, A

518 Nutrition and Aging (3) Nutritional problems of adults; nutritional requirements, dietary intakes; effects of aging on nutritional status. Prereq: Advanced Nutrition or consent of instructor. Sp

520 Nutritional Ecology (2) Examination of issues in natural, political, physical, and social environments that impact availability of food and nutrients in U.S. food supply. F

521 Physiological Basis for Diet and Disease (2) Altered nutrient needs as result of metabolic changes that occur in selected disease states. Prereq: Nutrition in Disease or consent of instructor. Sp

522 Nutrition Counseling (2) Individual eating habits and disorders, evaluation strategies for effectiveness of helping process. Prereq: Nutrition in Disease or consent of instructor. F

524 Nutrition Education: Principles, Implementation, and Evaluation (3) Conceptual models, principles, application, and evaluation models in nutrition education research. Prereq: 508 or consent of instructor. Su

540 Seminar in Nutrition (1) May be repeated. S/N only. E

541 Research Methods (1) Basic principles of planning, conducting, and interpreting nutrition and foodservice systems administration research. Prereq: 6 graduate hrs in nutrition and food system administration and statistics. Sp

542 Advanced Experimental Nutrition (2) Application of research principles to individual projects using experimental animals. Prereq or coreq: 541. Sp

544 Food and Nutrition Survey Methods (2) Project for assessment of food consumption, nutrient intake, nutritional status, and sociocultural economic parameters in populations. Prereq or coreq: 541. Sp

547 Field Experience (3-9) Experience in food-related industry or agency under supervision of faculty member. Prereq: Consent of instructor. S/N only. E

548 Directed Study in Nutrition (1-3) Advanced study in nutrition. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

549 Special Topics (1-3) Recent advances in nutrition or food systems administration. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

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

602 Advanced Topics in Nutrition Science (1-3) Comprehensive individual study and group discussion of topics related to current problems in nutrition. Prereq: 512 or consent of instructor. May be repeated. F

603 Current Trends in Food and Sociocultural Change (2) Critical evaluation of research. Prereq: 508 or consent of instructor. F

Hotel and Restaurant Administration

GRADUATE COURSES

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

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

530 Computer-Assisted Foodservice and Lodging Management (3) Application of computer technology to foodservice and lodging industry: Inventory, cost accounting, production, nutrient analysis, room management, and sales planning and analysis. Prereq: Quantity Food Procurement, Production and Service, Microcomputer Applications or consent of instructor. F

531 Advanced Financial Management (3) Financial planning, operations and evaluation techniques used in foodservice and lodging management: Developing budgets, accounting systems and financial reports. Prereq: Food and Lodging Cost Control or consent of instructor. F

532 Advanced Human Resource Management (3) Identifying labor needs; development and maintenance of workforce. Prereq: Food and Lodging Personnel Development or consent of instructor. F

533 Advanced Food Production and Delivery Systems Management (3) Principles and implementation of food production and delivery systems; application of quantitative methods and models to optimize decisions. Prereq: Quantity Food Procurement, Production and Service or consent of instructor. F

534 Special Topics in Foodservice and Lodging Administration (1-3) Lecture/discussion format. Con-
temporal developments and trends in industry. Prereq: Consent of instructor. May be repeated. E

535 Directed Study in Foodservice and Lodging Administration (1-3) Problems selected for study by student with guidance of faculty member. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. E

537 Seminar in Foodservice and Lodging Administration (1) May be repeated. S/N only, F

542 Advanced Hotel Administration (3) Strategic management of hotel organizations. Theoretical and applied literature on hotel operation and implementation of strategy. Prereq: Hospitality Administration (1-3) or consent of instructor. May be repeated. S/A

544 Experimental Study of Quantity Food Production (3) Design and preparation of food products applicable to foodservice industry. Market research, sensory evaluation, production techniques, and microbiological evaluation of food. Prereq: Quantity Food Procurement, Production and Service with lab, or Observation, Hospitality Sales and Marketing, 542 and Nutrition 413, or equivalents. F,A

546 Foodservice and Lodging Administration Research Methods (2) Application of research methods to foodservice and lodging. Prereq or coreq: Nutrition 541, Sp

547 Field Experience (3-9) Experience in food- and lodging-related industry or agency under supervision of faculty member. Prereq: Consent of instructor. S/N only, F

555 Foodservice and Lodging Law (3) Management organization and policy as imposed or granted by law. Legal research to determine legal principles at state and federal levels which impact industry. Prereq: Hospitality Law or equivalent, or consent of instructor. Sp,A

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

610 Advanced Topics in Lodging Administration (1-3) Individual study and group discussion of topics related to current problems. Prereq: 542 or consent of instructor. Sp,A

620 Advanced Topics in Foodservice Administration (1-3) Individual study and group discussion of topics related to current problems. Prereq: 533 or consent of instructor, F,A

Ornamental Horticulture and Landscape Design
(College of Agricultural Sciences and Natural Resources)

MAJOR DEGREE

Ornamental Horticulture and Landscape Design........................................ M.S.

Don B. Williams, Head

Professors:

Callahan, L. M., Ph.D. ................................ Rutgers
Creater, G. Douglas, Ph.D. ................................ Ohio State
Graham, E. T. (Emeritus), Ph.D. ............... Penn State
Grasshoff, Peter M. (Rachelle Chair of Excellence), Ph.D. ................. Australian National
McDaniel, G. L., Ph.D. ................................ Iowa State
Williams, Don B., Ph.D. ......... Penn State

Associate Professors:

Augé, Robert M., Ph.D. ................. Washington State
Day, J. W., Ph.D. ................................ Mississippi State
Rogers, S. M., M.L.A. ......................... Georgia

Trigiano, R., Ph.D. ...................... NC State
Witte, Willard T. (Liaison), Ph.D. ........... Maryland

Assistant Professor:

Hamilton, Susan, Ed.D. ....................... Tennessee
Menendez, Garry, M.S. ....................... Tennessee
Starman, Terri W., Ph.D. ..................... Texas A&M

The Department of Ornamental Horticulture and Landscape Design offers the Master of Science with concentrations in floriculture and landscape design, nursery science and technology, or turfgrass science and technology. Various interests may be emphasized in any of these commodity areas, including micropropagation, innovative production and maintenance systems, computer-aided management systems, and the molecular biology, genetics, histology and stress physiology of ornamentals.

For admission, the student must have a B.S. in ornamental horticulture, horticulture, plant science, or a related agricultural or basic science discipline. Undergraduate transcripts must be evaluated by the department for prerequisite requirements, if any. Graduate research assistantships are available on a competitive basis. For further information, contact the department head.

THE MASTER'S PROGRAM

Thesis Option

1. A thesis is required. A master's committee of no fewer than 3 faculty members will be selected. Prior to research for the thesis, a proposal must be approved by the master's committee. Registration for 6 hours of Thesis 500 is required.

2. In addition to the thesis requirement, a minimum of 24 hours of graduate credit is required. Not more than 10 hours of the minimum 30 hours can be below the 500 level. The academic program must be approved by the master's committee which may require additional coursework if the student's progress or background indicates such need.

3. All students are required to include 510 Research Methods and 2 hours of 590 Seminar in their program and are expected to attend this course and participate in discussions each semester enrolled.

4. Twelve hours of coursework in the major must be at the graduate level, exclusive of Thesis 500.

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

Non-Thesis Option

1. A master's committee of no fewer than 3 faculty members will be selected.

2. Thirty-four hours of graduate coursework are required of which 22 hours must be at the 500 level or above.

3. All students are required to include 2 hours of 590 Seminar in their program and are expected to attend this course and participate in discussions each semester enrolled.

4. Twelve hours of coursework in the major must be at the graduate level.

5. Final comprehensive written and oral examinations shall be taken upon completion of no fewer than 32 hours of approved graduate work.

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GRADUATE COURSES

410 Nursery Management and Production (3) Modern management methods as applied to nursery and garden operations. Prereq: 220, 330, and Plant and Soil Science 570, or consent of instructor. 2 hrs and 1 lab. Sp,A

420 Advanced Floriculture Science and Technology (3) Physiology and greenhouse production of floriculture crops. Cultural practices: propagation, planting, spacing, fertilization, temperature and daylighting regimes, harvesting, shipping, marketing, and pest control. Prereq: Greenhouse Production and Management or consent of instructor. 2-3 hrs. Sp

440 Advanced Turfgrass Management (4) Principles and scientific basis of turfgrass culture: adaptation, ecology, physiology, soil fertility, and grass nutrition, climate influences on grass cultures; physiology of clipping and water management; design, construction, and management of golf courses; and physiological influences of pest infestation and control measures. Prereq: 340 or consent of instructor. 3 hrs and 1 lab. Sp,A

451 Plant Tissue Culture (3) (Same as Botany 451.)

460 Professional Practices in Landscape Construction and Management (2) Professionalism, salesmanship, proposals, bidding, estimating, specification, and contract management in landscape services industries. Interaction with industry representatives through special presentations. Prereq: 350 or consent of instructor, F

480 Advanced Landscape Design (4) Comprehensive application of landscape design skills. Design applications involving site layout, grading, planting, landscape construction, planting design. Analysis, programming, design, detailing, estimating, and specifying applicable to variety of landscape projects. Prereq: 280, 350, and 380, or consent of instructor. 1 hr and 2-3 hrs. Sp

485 Computer Aided Landscape Design (3) Overview of drafting and design (CAD). Site planning and construction of related landscape plan view and 2-D drawings. Introduction to operating systems; techniques on utilization of AutoCAD and LANDCAD software. Prereq: Fundamentals of Landscape Design, Microcomputer Applications to Problem Solving or consent of instructor. 2-3 hrs. F,Sp

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

501 Special Topics in Ornamental Horticulture and Landscape Design (1-3) Topics to be assigned. May be repeated. Maximum 5 hrs. Prereq: Consent of instructor. E

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

510 Research Methods in Ornamental Horticulture and Landscape Design (2-3) Literature retrieval; research proposal writing; use of computers for word processing, data entry, statistical analysis, and graphics production. Prereq: All students in thesis option. Prereq: Plant and Soil Science 471. F

511 Plant Disease Fungi (3) (Same as Entomology and Plant Pathology 510.)

550 Plant Microtechnology (3) Practical light and scanning electron microscopy methods for investigating aspects of plants and plant tissues, subcellular, cellular, and subcellular structures in plants and plant pathologies. Prereq: 8 hrs biological/botanical sciences and consent of instructor. 1 hr and 2 labs. Su

570 Physiology and Development of Ornamental Plants (3) Basic and applied aspects of the physiology of ornamental plants related to growth and development in production and utilization. Critical review of literature and discussion of current advances in growth and development, flowering, photoperiodism, vernalization, cold acclimation, hardiness, dormancy, growth regulators, environmental stress, and post-harvest consideration. Prereq: Botany 201 and consent of instructor. S/A

590 Seminar (1) Current literature and developments. May be repeated. Maximum 3 hrs. E
593 Problems in Ornamental Horticulture and Landscape Design (1-3) Independent study. Current topic related to technology and science. May be repeated. Maximum 6 hrs. E

Pathology
See College of Veterinary Medicine and Comparative and Experimental Medicine

Philosophy
(College of Arts and Sciences)

MAJOR DEGREES

Philosophy ........................................... M.A., Ph.D.

Kathleen Bohstedt, Head

Professors:

Aquila, Richard E., Ph.D. .......... Northwestern
Brenkert, George G., Ph.D. ......... Michigan
Cebik, L. B., Ph.D. ....... Nebraska
Davis, John W. (Emeritus), Ph.D. .... Emory
Edwards, Rem B., Ph.D. ............... Emory
Graber, Glenn C., Ph.D. ......... Michigan
Nelson, James L., Ph.D. ............. SUNY (Buffalo)
Postow, Betsy C., Ph.D. .......... Yale
Van de Vate, Dwight, Jr., Ph.D. ...... Yale

Associate Professors:

Bennett, James O., Ph.D. ............. Tulane
Bohstedt, Kathleen Emmett (Lisison), Ph.D. ........... Ohio State
Cohen, Sheldon M., Ph.D. ......... Northwestern
Nolt, John E., Ph.D. .......... Ohio State
Osborne, Martha Lee, Ph.D. .......... Tennessee

Assistant Professors:

Baylis, Francois, Ph.D. ............... Western Ontario
Hamin, L. Phillips, Ph.D. ............ Georgia

The Department of Philosophy offers graduate study leading to the Master of Arts and Doctor of Philosophy. The M.A. program includes thesis and non-thesis options and offers concentrations in medical ethics and in religious studies. The Ph.D. program also has a concentration in medical ethics. Detailed information may be obtained from the Director of Graduate Studies in Philosophy.

THE MASTER'S PROGRAM

The department offers both a thesis and a non-thesis option. The course requirements for the M.A. with a thesis are 30 hours, including 9 hours in Philosophy 500. Of non-thesis hours, at least two-thirds must be in courses at or above the 500 level. Students seeking the non-thesis option must also pass a final written examination on all work offered for the degree. An additional oral examination may be required.

THE DOCTORAL PROGRAM

Students must hold an M.A. with a major in Philosophy or an equivalent degree when entering the Ph.D. program. Twenty-seven hours of coursework beyond the M.A. is required, of which 6 hours will be in courses numbered above 600. See the Philosophy Department Graduate Student Procedures for specific course requirements.

Students must demonstrate a reading knowledge of one foreign language, normally a living language in which there exists a significant body of philosophical literature. (In special circumstances relating to the area of dissertation research, the Graduate Committee may approve a language not satisfying these conditions.) This may be done by passing the doctoral language examination given by the appropriate department, if available, or by passing French 302 or German 332 with a B or better. Bi- or multilingual (normally, foreign) students, whose native language (other than English) is one in which there is a significant body of philosophical literature, are exempted from the foreign language requirement. Students receiving the Ph.D. with concentration in medical ethics are also exempted.

CONCENTRATIONS

Medical Ethics
The department has an M.A. and Ph.D. program of graduate study with a concentration in medical ethics. Detailed information concerning the program may be obtained from either the Director of Graduate Studies in Philosophy or the Director of the Medical Ethics Program.

Religious Studies
The department has an M.A. program of graduate study with a concentration in religious studies. Details concerning the program may be obtained from the Director of Graduate Studies in Philosophy or the Department of Religious Studies.

ACADEMIC COMMON MARKET

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

GRADUATE COURSES

400 Special Topics (3) May be repeated when topic varies. Maximum 6 hrs.

411 Modern Religious Philosophies (3) (Same as Religious Studies 411)

412 Classical Indian Systems of Philosophy: The Moksha Tradition (3) (Same as Religious Studies 412)

420 Topics in History of Philosophy (3) Figures or movements from antiquity through mid-twentieth century. Prereq: 6 hrs of philosophy or consent of instructor. May be repeated when topic varies. Maximum 6 hrs.

425 American Philosophy (3) Colonial to early 20th Century. Prereq: 6 hrs of philosophy or consent of instructor.

435 Intermediate Formal Logic (3) Metatheory of formal logic and philosophy of logic. Prereq: Consent of instructor.

440 Contemporary Ethical Theory (3) Topics in meta-ethics or ethics. Prereq: 6 hrs of philosophy or consent of instructor.

446 Theoretical Issues in Medical Ethics (3) Prereq: 240 or 345 or consent of instructor. (Same as Religious Studies 446)

460 Philosophy of Science (3) Methodological and conceptual issues in natural and social science. Prereq: 350 and 1 yr of natural or social science, or consent of instructor.

465 Philosophy of History (3) Speculative and critical aspects of philosophy of history. Prereq: 6 hrs of philosophy or consent of instructor.

473 Philosophy of Mind (3) Problems of mind and body in relation to consciousness and personal identity. Prereq: 350 or consent of instructor.

475 Analytic Metaphysics and Epistemology (3) Topics in metaphysics and epistemology in recent Anglo-American tradition. Prereq: 6 hrs of philosophy or consent of instructor.

479 Studies in Recent Continental Philosophy (3) Selected thinkers or topics: existentialism, phenomenology, hermeneutics, structuralism, post-structuralism. Prereq: 6 hrs of哲学. Prereq: 6 hrs of philosophy or consent of instructor.

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

502 Registration for Use of Facilities (3-18) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May be repeated toward degree requirements. May be repeated. S/NC only. E

520 Topics in Ancient or Medieval Philosophy (3) Intensive critical work on major philosopher or school. May be repeated. Maximum 9 hrs.

522 Topics in Modern Philosophy (3) Intensive critical work on major philosopher or school. May be repeated. Maximum 9 hrs.

524 Topics in Twentieth-Century Philosophy (3) Intensive critical work on major philosopher or school. May be repeated. Maximum 9 hrs.

528 Topics in Contemporary Philosophy (3) Intensive critical work on themes in late 20th-century philosophy. May be repeated. Maximum 9 hrs.

540 Topics in Ethics or Value Theory (3) May be repeated. Maximum 9 hrs.

542 Topics in History of Ethics (3) Dominant movements in history of ethics. May be repeated. Maximum 9 hrs.

544 Topics in Applied Ethics (3) Single author, tradition, or topic in ethical theory. Application to Issues in health, business, technology, ecology, and other practical fields. May be repeated. Maximum 9 hrs.

546 Orientation to Medical Ethics (3) Survey of ethical theories in application to issues in medical ethics.

547 Ethical Issues in Mental Health (3) Values in "mental health" and "mental illness," informed consent in psychology, competence, patients' rights, involuntary hospitalization and treatment, and behavior control therapies.

548 M.A. Clinical Practicum (3) Series of clinical rotations at one or more local health care institutions. Open only to graduate students concentrating in medical ethics. Prereq: 547 and consent of Medical Ethics Committee and the UTMC Graduate Education Committee.
nature. At least 20 hours must be taken at the 500 level or above. In addition, the candidate must pass a written examination administered by his/her committee.

THE DOCTORAL PROGRAM

All students are expected to take Physics 521-22, 531-32, 541-42, 551, 561, 571-72, and 611. Physics 601-02 are normally required of students specializing in atomic physics; Physics 621-22 of students in nuclear physics; Physics 626-27 of students in elementary particle physics; Physics 663-64 of students in plasma physics; Physics 681-82 of students in health physics; Physics 671-72 of students in solid state physics; and Physics 681-82 of students specializing in molecular spectroscopy. Students specializing in chemical physics may substitute Chemistry 572 for Physics 551 and should complete at least 6 semester hours chosen from Chemistry 580, 670.

The courses Physics 531-32, 571-72, 521-22, 541-42, 561 constitute the core curriculum. They are the usual basis for the departmental comprehensive examination which is normally taken by a well-prepared student after two years of graduate study.

A reading knowledge of one foreign language in which there exists a significant body of literature is required. German 332 or French 302 with a grade of A or B may be substituted for the corresponding language examination.

The dissertation topic will be chosen with reference to one of the fields in which research facilities can be made available either at The University of Tennessee laboratories in Knoxville; The University of Tennessee Space Institute at Tullahoma, Tennessee; the Oak Ridge National Laboratory, Oak Ridge, Tennessee; or at other research facilities used by the University faculty.

Astronomy

GRADUATE COURSES

411 Astrophysics (3) Development of analytical physical models of galactic structure of universe, stellar and interstellar matter, and planetary systems. Topical and interdisciplinary, consideration of quasars, pulsars, black holes and current developments in field. Acceptable for major credit in physics. Prereq: Physics 232 and consent of instructor.

490 Special Topics in Astronomy (1-3) Topics of current interest in astronomy and astrophysics. Acceptable for graduate credit in physics with consent of department. May be repeated with consent of department. Maximum 9 hrs.

Physics

GRADUATE COURSES


421 Modern Optics (4) Transmission of light in uniform, isotropic media; reflection and transmission at interfaces; radiation of light by wave motion and interference effects. Rudiments of Fourier optics and holography. Prereq: 431, or Fundamentals of Physics: Wave Motion, Optics, and Modern Physics, or Honors: Mechanics and Heat, and consent of instructor. 3 hrs and 3 labs.


451 Techniques of Theoretical Physics (3) Methods and general solutions in potential theory, spectral analysis, wave mechanics, specific Sturm-Liouville system and other selected techniques of theoretical physics. Must be taken in sequence. Prereq: Fundamentals of Physics: Wave Motion, Optics, and Modern Physics or Honors: Mechanics and Heat, and Calculus III. Coreq: Matrix Algebra I.

461-62 Modern Physics Laboratory (3,3) - Introduction to fundamental and modern techniques in experimental physics, and to theory and practice of measurement and data analysis. Selected experiments in nuclear, atomic, molecular and solid state physics, and modern optics. Prereq: Electronics Laboratory and either Fundamentals of Physics: Modern Physics or 411, 462 - Advanced experiments and experimental techniques in modern physics; experimental team work. Through quantum mechanical interpretation of results and preparation of scientific reports. Prereq: 461, 6 hrs lab per week.

471-72 Health Physics (3,3) Radioactivity, interaction of electromagnetic radiation with matter, radiation quantities and units, ionization processes, x-rays and gamma rays, neutron activation, interaction of charged particles with matter, stopping power, range-energy relationships, collimation, dosimetry, waste disposal, criticality prevention, radiation biology and ecology. Prereq: Consent of Instructor.

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

501 Graduate Research Participation (3) Advanced research techniques under supervision of staff research director or research assistant. Course coincides with interests of student. Open to all graduate students in good standing. Prereq: Consent of department and research director. May be repeated with consent of department. Maximum 18 hrs. S/NP only. E

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

506 Experimental Methods (3) Principles, real operational behavior, and hazards of laser types, radiation detectors, photomultiplier tubes, image intensifiers, imaging systems, x-rays, fast framing cameras, high voltage systems including cryogenic-based devices, data acquisition techniques including synchronously-triggered electronics-methods and micro-computer data acquisition and registration methods.

507 Contemporary Optics (3) Topics in geometrical, physical, Fourier, and nonlinear optics and introductory laser physics. Extensive use of computer calculations and design of practical and sophisticated optical systems.

508 Laser Physics (3) Mode analysis, stable and unstable resonators; rate equations and population inversion; stimulated, relaxation, oscillations, fluctuations and noise, laser stability; quantum theory of laser, photon coherence; mode-locking and frequency stabilization; specific laser types; semiconductor and solid-state, excimer, copper vapor and dye lasers.

511-12 Theoretical Physics (3,3) Classical theoretical physics, with limited use of mathematics. Prereq: 312, 432, advanced calculus, differential equations, and vector analysis.


532 Advanced Classical Mechanics (3) Variational principles, canonical transformations, Hamilton-Jacobi theory, nonlinear mechanics, elasticity, fluid mechanics. Prereq: 531.


561 The Theory of Relativity (3) Geometry of space-time, relativistic electrodynamics, particle mechanics and continuum mechanics, Einstein's field equations, Schwarzschild solutions, the classical test of general relativity. C or coreq: 531 and 542.


574 Group Theory for Physicists (3) Introduction to abstract group theory, discussion of continuous and discrete groups, representation theory, Noether's theorem, symmetries and degeneracies, application of group-theoretical methods to atomic physics, solid-state physics, and particle physics. Prereq: 571-72.

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

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

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

594 Special Problems (3) Especially assigned theoretical or experimental work on problems not covered in other courses. May be repeated. Maximum 9 hrs. E


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


605 Laser Spectroscopy (3) Application of lasers to spectroscopy of atomic and molecular systems; review of classical multi-pole radiation, atomic L-S and J-J coupling and Zeeman effects, spontaneous emission of atomic systems and oscillator strengths, selection rules of dipole and quadrupole transitions; radiationless transitions and formation of spectral lines. Study of saturated absorption spectroscopy, resonance fluorescence and strong field effects, Hanle effect, optical double resonance, optical pumping and hyperfine spectroscopy. Prereq: 521, 541, 508.
606 Nonlinear Optics (3) Nonlinear optical susceptibilities, wave propagation in nonlinear media, sum-frequency and difference frequency generation, harmonic generation, parametric amplification and oscillation, stimulated Raman processes, two- and multi-photon processes, four-wave mixing and phase conjugation, transient coherent optical effects and free induction decay, optical breakdown and nonlinear effects in plasmas. Prereq: 522.

610 Quantum Optics (3) Quantum theory of emission and absorption of radiation; frequency-dependent susceptibility; coherence theory; field quantization and coherent photon states; interaction of radiation with atoms; photon optics, counting and higher-order coherence; atomic scattering phenomena. Prereq: 521.

611 Advanced Quantum Mechanics & Field Theory (3) Second quantization, quantization of electromagnetic field, emission, absorption, and scattering of light, bremsstrahlung, pair creation and annihilation, quantum field theory methods in condensed matter physics, and quantum optics. Topics vary according to instructor. Prereq: 522 and 542 or equivalent. Prereq or cons: 561 or consent of instructor.

612 Advanced Topics in Quantum Field Theory (3) Renormalization, Lamb shift, anomalous magnetic moments, gauge theories, electroweak theory, quantum chromodynamics, grand unified theories, and advanced topics in laser physics and quantum optics. Topics vary according to interest of students, Instructor and present state of physics. Prereq: 521 or 561 or consent of instructor.

621-22 Nuclear Structure (3,3) General properties of nucleus; two-body scattering processes; saturation and symmetry properties of nuclear forces; theory of light nuclei; nuclear spectroscopy; special nuclear models; theory of nuclear reactions; theory of beta-decay. Prereq: 571-72.

625-27 Elementary Particle Physics (3,3) 626-Survey in elementary particle physics covering experimental methods, conservation laws, invariance principles, and models of interactions. 627-Advanced Topics: quark models, electroweak interactions and unification of elementary forces. Prereq: 522.

641 Advanced Topics in Classical Theory (3) To meet special needs of students. Advanced dynamics and hydrodynamics, electromagnetic theory, statistical mechanics, or theory of nonequilibrium processes. Prereq: 532, 542, 551. May be repeated with consent of department. Maximum 3 hrs.

642 Advanced Topics in Quantum Theory (3) To meet special needs of students. Angular-momentum theory, beta-ray theory, theory of atomic spectra, molecular structure and valence theory, theory of radiation, electric and magnetic properties of high energy processes, scattering and collision processes, or theory of fields. Prereq: 522. May be repeated with consent of department. Maximum 3 hrs.

643 Computational Physics (3) Developing computer algorithms for solving representative problems in various fields of physics, celestial dynamics in astrophysics, boundary value problems in electromagnetism, atomic and nuclear structures, band structure on solid state physics, transport problems in statistical mechanics; Monte Carlo simulation of liquids, fitting and interpolation of data, correlation analysis, or optimization strategy. Prereq: 522, 531, 542, and 572.

661-62 Collision Interactions (3,3) Interaction of electromagnetic radiation and charged particles with atoms and molecules or free particles, scattering, ionization, transport and energy deposition, collective excitations, Cerenkov radiation, and stopping power. Prereq: 522.

663 Advanced Plasma Physics (3) (Same as Electrical Engineering 663.)

671-72 Advanced Solid State Physics (3,3) Lattice dynamics, phonons, Brillouin zones, heat capacity, energy band structure of solids, cohesio energy, work function, Crystal oscillator strengths, effective mass approximation, Drude-para-ferro-magnetism; neutron diffraction, Fermi surface, superconductivity, X-ray and electron scattering from phonons, electrons, and defects. Excitations, polarons, surface states, F-centers, dislocations, and other defects. Prereq: 542, 522, or equivalent.

681-82 Molecular Spectroscopy (3,3) Spectroscopic methods of determining molecular properties, theoretical and experimental aspects of intra- and inter-molecular energy and charge transfer, group theoretical methods and selection rules in gases and condensed phases, normal coordinates and potential functions, vibration-rotation interaction theory, intensities, frequencies and lineshapes of molecular transitions. Prereq: 532 and 542 or consent of instructor.

Planning
(College of Architecture and Planning)

MAJOR: DEGREE
Planning ........................................ M.S.P.

David A. Patterson, Acting Director

Professors:
Johnson, David A., Ph.D. ..................... Cornell University
Kenney, Kenneth B. (Emeritus), Ph.D. ........................................ North Carolina State University
Prechaska, J. M. (Emeritus), M.U.P. ... Michigan State University
Shouse, W. E. (Emeritus), M.C.P..... Harvard University
Spencer, James A. (Liaison), M.C.P. Ohio State University

Associate Professors:
Browne, George E., M.A. ....... George Washington University
Patterson, David, Ph.D. ............... Indiana University

Assistant Professors:
Anderson, Annette, M.P.A. .......... Missouri University
Mutchane, Mur, M.S.P. ................. Tennessee State University
Zanetta, Maria C., Ph.D. .............. Ohio State University

Lecturer:
Brown, Nancy, M.S.P. ............... Tennessee State University
Cole, Patrice, M.S.P. .................. Tennessee State University
Reese, Kristin, M.S.P. ................. Tennessee State University
Richardson, Keith, B.Arch. .............. Tennessee State University

The Graduate School of Planning offers a program of studies leading to the professional degree of Master of Science in Planning. The degree is the normal route for entry into professional positions in urban and regional planning or related positions. Graduates are candidates for positions in regional, city, county, and metropolitan planning agencies; in local, state, and federal agencies concerned with physical, economic, and administrative planning; in private business and organizations dealing with development problems; and in private consulting.

The Master of Science in Planning program is accredited by the Planning Accreditation Board, a joint undertaking of the American Institute of Certified Planners and the Association of Collegiate Schools of Planning.

THE MASTER'S PROGRAM

Admission Requirements
Applicants are to submit an application for admission to The Graduate School, and two letters of reference from faculty familiar with their prior academic work and a statement describing personal career objectives directly to the School of Planning. If the applicant has prior work experience in planning, a reference letter should be also provided by the work supervisor. Graduate Record Examination scores are requested of all applicants whose undergraduate GPA is below 3.0. Other applicants are encouraged to submit them. Students who have not taken an appropriate undergraduate statistics course will be required to take one as part of their graduate program.

Degree Requirements
The M.S.P. requires completion of at least 48 hours of graduate credit, at least 30 of which must be in planning. The following courses are the core curriculum required of all students: 510, 511, 512, 515, 520, 521, 530, 531, 532, 540 and 570.

Students should plan to enter the program in the fall term to take core courses in the proper sequence.

Each student is required to develop an area of concentrated competence beyond the core curriculum. After selecting the area of concentration, usually by the end of the second semester, the student takes a minimum number of courses or hours from a prescribed set of courses in the subject area. Further enhancement of the concentration is gained by focusing the thesis or major paper on the subject. Concentration courses are drawn from the planning curriculum and from other departments in the University. Concentrations are available in land use planning, environmental planning, real estate development planning, and transportation planning.

Students have the latitude to propose an alternate specialization consisting of at least 9 hours of coursework, subject to approval of a faculty committee.

Each student is required to demonstrate competence in individual research. This may be done in one of two ways:

Thesis Option—Complete a thesis for 6 hours credit.

Non-Thesis Option—Complete a major study with acceptable documentation. To be eligible for the major study option, the student must have completed at least 12 hours of graduate coursework in planning with at least a 3.5 cumulative grade-point average. The student meeting these criteria may present a proposal to his/her committee for a major study that will include at least 6 hours of subsequent coursework. The proposal shall justify the selection of the topic, describe the approach to the study, and describe the nature of the final product. The topic will normally be expected to reinforce or complement the student's concentration.

Student academic progress is monitored by the faculty. A student failing to achieve an acceptable grade-point average may be placed on probation or dismissed from the program.

ACADEMIC COMMON MARKET

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

GRADUATE COURSES

401 The City in the U.S. (3) Development and character of U.S. cities. Contemporary issues and selected case studies. (Same as Urban Studies 401.)

402 Survey of Planning (3) History of city development and of planning: U.S. experience in urban and other levels of planning. State of the art, process, comprehen-
sive plans, implementation devices, planning issues in society. Not for credit for M.S. degree.

446 Housing (3) Nature and demand for housing in U.S. and abroad, land use planning, market processes and public influences. Problems of change in housing supply, impact of new technology, and governmental programs to improve supply and quality of housing.

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


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

510 Fundamentals of Planning (2) History of planning structure and development of urban areas, operations of contemporary planning, trends and issues.

511 Graphic and Oral Communications in Planning (1)

512 Community Planning Process (1) Planning process, policy process and development process. Field reconnaissance of study community and the development of approaches for assessing community.

515 Theory of Planning (2) Nature and objectives of planning process; role of planner and planning function in public decision-making. Prereq: 510 or consent of instructor.

520 Planning Research Methods (3) Overall structuring of social science research in planning practice; familiarity with structure of planning literature information sources, systematic retrieval techniques, processes and tools, practice in posing research questions relevant to planning.

521 Information Systems and Networks in Planning (3) Use and impact of computer-based information systems and global networks on planning and public management. Development of practical skills in design of planning decision-support systems, databases, Internet-based tools and geographic information systems (GIS). Prereq: Basic experience with computer software, hardware or coursework in computer science.

523 Statistics for Planners (3) Applications of statistical techniques. Intuitive explanations and practical applications. Computer analysis to explore concepts.


526 Library Research for Planning (1) Survey of publications of interest to planners, resources and research techniques. Use of facilities and collections of library.

530 Policy and Land Use Analysis (4) Basic methods of policy analysis and planning. Concept and framework for land-use planning. Population, employment, and economic base studies; forecasting techniques. Coreq: 550 or consent of instructor.

531 Urban and Regional Analysis (3) Past, present and possible future patterns of urban and regional structures; drawing on contemporary theories, models, and empirical research.

532 Planning Methods (4) Preparation of comprehensive plans for urban areas or regions. Development of baseline data and forecasts, formulation of alternative plans and strategies, and development of plan implementation programs. Extensive laboratory experience. Prereq: 510, 512, 520, 530 and 531 or consent of instructor.

533 Planning and Transportation (3) (Same as Civil Engineering 558.)

534 Urban and Site Design (3-6) Principles of design of residential subdivisions and some components of physical community, shopping centers, institutional complexes, central business districts. Problems of reviewing alternative designs against each other or written regulations. Extensive laboratory experience.

535 Planning for Historic Preservation (3) Planning for preservation, restoration, and conservation of historic buildings, areas and sites related to comprehensive planning process, National and state, and local government role in protection of sites, legislative needs, financing and administration of historic resources. Prereq: 510 or consent of instructor.

540 Legal Aspects of Planning (3) Legal basis for planning and guiding community development. Legal tools of planning. Prereq: 510 or consent of instructor.

545 Planning and Property Development (2) Process of urban physical growth and change; financing of public sector real estate development and its relationship to planning. Partnership roles of public and private sectors in urban development and redevelopment. Prereq: 510 or consent of instructor.

547 Negotiation (1) Methods, techniques, and skills useful to planners in mediation, negotiation, and dispute resolution concerning urban planning and development.

548 Tourism Planning (3) Planning of tourist resources and programs within a geographic region. Tourism planning models. Relationships among tourists, tourism development and planning of tourist attractions and services. Application of techniques in selected areas.

549 Local Fiscal Planning and Capital Improvements (3) Fiscal planning and capital improvements programming in plan implementation. Tax and expenditure limitations, transportation financing, municipal bond market, alternative revenue sources: development fees, excises, intergovernmental aid. Extensive laboratory experience.


551 State and Regional Planning (3) Theory and practice of planning at state, sub-state, and metropolitan levels.

552 Development Planning in the Third World (3) Seminar on urban and regional development in Third World nations. Population growth, settlement patterns, economic development, land framework of integrated resource management. (Same as Ecology and Evolutionary Biology 552.)

553 Environmental Planning (3) Role of planners and planning in maintenance of balance between natural and built environment. (Same as Ecology and Evolutionary Biology 555.)

556 Policy Analysis and Strategic Planning (3) Models of policy making process and role of strategic planning and applied decision making. Quantitative and qualitative approaches to evaluation and program evaluation, and impact assessment.

570 Plan Implementation Process (1) Interactive community and governmental dynamics in plan implementation. Dynamics of change, conflict, resolution and consensus building.

590 Practicum (3) Prereq: Consent of instructor. S/N or letter grade.

591 Special Topics (1-3) Prereq: Consent of instructor.

592 Readings in Planning (1-3) Prereq: Consent of instructor. May be repeated.

593 Problems in Planning (1-3) Prereq: Consent of instructor.

635 Environmental Assessment and Sustainable Development in Third World Countries (3) (Same as Ecology and Evolutionary Biology 635 and Botany 635.)

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### Plant and Soil Science

(Originally published as "Plant and Soil Science"

**Major:**

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<th>DEGREES</th>
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<td>M.S., Ph.D.</td>
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**Fred L. Allen, Head**

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**Professors:**

| Allen, Fred L., Ph.D. .......... M.S., Ph.D. .......... Iowa State |
| Bell, Frank F. (Emeritus), Ph.D. .......... M.S., Ph.D. .......... Minnesota |
| Boswell, F. C. (Adjunct), Ph.D. .......... M.S., Ph.D. .......... Penn State |
| Coffey, D. L., Ph.D. .......... M.S., Ph.D. .......... Purdue |
| Conger, B. V. (Distinguished Prof.), Ph.D. .......... Washington State |
| Duck, B. N., Ph.D. .......... M.S., Ph.D. .......... Auburn |
| Foss, John E., Ph.D. .......... M.S., Ph.D. .......... Minnesota |
| Fribourg, Henry A., Ph.D. .......... M.S., Ph.D. .......... Illinois |
| Hayes, R. M., Ph.D. .......... M.S., Ph.D. .......... Auburn |
| Josephson, L. M. (Emeritus), Ph.D. .......... M.S., Ph.D. .......... Wisconsin |
| Lewis, R. J. (Emeritus), Ph.D. .......... M.S., Ph.D. .......... NC State |
| Luxmore, R. J. (Adjunct), California (Riverside) |
| Miller, R. D., Ph.D. .......... M.S., Ph.D. .......... Kentucky |
| Mullins, C. A., Ph.D. .......... M.S., Ph.D. .......... Tennessee |
| Parks, William L. (Emeritus), Ph.D. .......... M.S., Ph.D. .......... Purdue |
| Reynolds, John H., Ph.D. .......... M.S., Ph.D. .......... Wisconsin |
| Sams, C. E., Ph.D. .......... M.S., Ph.D. .......... Michigan State |
| Sezic, Lloyd F. (Emeritus), Ph.D. .......... M.S., Ph.D. .......... NC State |
| Snyder, L. N. (Emeritus), M.S., Ph.D. .......... M.S., Ph.D. .......... Kansas State |
| Springer, M. E. (Emeritus), Ph.D. .......... M.S., Ph.D. .......... California |
| Swingle, H. D. (Emeritus), Ph.D. .......... M.S., Ph.D. .......... Florida |

**Associate Professors:**

| Ammons, J. T., Ph.D. .......... M.S., Ph.D. .......... West Virginia |
| Dayton, D. E. (Liaison), Ph.D. .......... M.S., Ph.D. .......... NC State |
| Krueger, W. A., Ph.D. .......... M.S., Ph.D. .......... Illinois |
| Lee, S. Y. (Adjunct), Ph.D. .......... M.S., Ph.D. .......... Wisconsin |
| Lessman, Gary M., Ph.D. .......... M.S., Ph.D. .......... Michigan State |
| Logan, Joanne, Ph.D. .......... M.S., Ph.D. .......... Nebraska |
| Reich, V. H., Ph.D. .......... M.S., Ph.D. .......... Iowa State |
| Wyatt, J. E., Ph.D. .......... M.S., Ph.D. .......... Kentucky |

**Assistant Professors:**

| Essington, M. E., Ph.D. .......... M.S., Ph.D. .......... California (Riverside) |
| Mueller, Thomas C., Ph.D. .......... M.S., Ph.D. .......... Georgia |
| Mullen, M. D., Ph.D. .......... M.S., Ph.D. .......... Nebraska |
| Newton, D. (Adjunct), M.S., Ph.D. .......... M.S., Ph.D. .......... NC State |
| Wilson, G. V., Ph.D. .......... M.S., Ph.D. .......... Arkansas |

The Department of Plant and Soil Science offers graduate programs leading to the Master of Science and the Doctor of Philosophy. Concentrations for the graduate programs are offered in soil science, plant breeding and genetics, and crop physiology and ecology. For further information, contact the department head.

**THE MASTER'S PROGRAM**

**Thesis Option**

This option requires writing a thesis based on original research. Six hours of 500 Thesis are required. Prior to conducting research, the student must develop a detailed written research plan. In addition to the thesis hours, a minimum of 24 hours of graduate coursework is required, of which at least 14 must be taken in courses numbered 501 and above. The student's advisory committee may require additional coursework if the student's progress or background indicates such need. Each student is required to take 1 hour of 501 and 1 hour of 593, and to present an exit seminar on the thesis research.

The student's advisory committee consists of the major professor, who acts as chairperson of the committee, and a minimum of two other
faculty members. The advisory committee approves the student's research problem and coursework and conducts the final oral examination integrating the thesis and coursework.

A student having started on the thesis option is not eligible to transfer to the non-thesis option after the end of the first semester of graduate studies or after having received a Graduate Research Assistantship stipend for more than one semester. A student having started on the non-thesis option may transfer to the thesis option upon approval by a potential major professor and the Department Head.

Non-Thesis Option

A student desiring the non-thesis option should declare this intention at the beginning of the first semester of graduate studies, and must declare it before the beginning of the second semester. In lieu of thesis, students are required to complete 3 hours of 593 for satisfactory participation in a single research program for a period of 12 weeks and the writing of an original, creative and well-written report, both to be conducted by the major professor and approved by the advisory committee. In addition to 3 hours of 593, a minimum of 26 hours of coursework is required, of which at least 20 must be taken in courses numbered 501 or above, for a total of 33 hours.

The student's advisory committee may require additional coursework if the student's progress or background indicates such need. Each student is required to take 1 hour of 501 and 2 hours of 503.

The student's advisory committee consists of the major professor, who acts as chairperson of the committee, and a minimum of two other faculty members. The advisory committee approves the student's coursework and the report on participation in a research program for 593. Students are required to take a written comprehensive examination integrating the coursework.

THE DOCTORAL PROGRAM

A minimum of 72 hours beyond the Bachelor's degree, exclusive of credit for Thesis 500, is required. Of this number, 24 hours must be Doctoral Research and Dissertation 600. A minimum of 28 hours must be completed in courses numbered above 500 exclusive of doctoral research and dissertation, of which 6 must be in courses numbered above 600. A minimum of 9 hours of graduate course work taken during the doctoral program must be outside the department in one or more cognate areas.

The student and the major professor identify a doctoral committee composed of at least four faculty members holding the rank of assistant professor or above, three of whom, including the chair, must be approved by the Graduate Council to direct doctoral research. At least one member must be from outside the department. The committee must approve all coursework applied toward the degree, certify the student's mastery of the major field and any cognate areas, direct the research, and recommend the dissertation for approval and acceptance by the Graduate School.

GRADUATE COURSES

411 Soil Microbiology (3) Soil microbial populations and role in soil ecosystem, microbial transformation of inorganic and organic compounds, decomposition of residues, dynamics of soil organic matter. Prerequisite: Introduction to Soil Science and Introduction to Organic and Biochemistry or Organic Chemistry or consent of instructor. 2 hrs and 1 lab. F.A

412 Soil Genesis and Classification (3) Soil genesis and formation; observing and describing morphologic characteristics of soil horizons and soil profiles. Prerequisites: completion of soil physical and chemical properties, classification. 3 weekend field trips. Prerequisite: Introduction to Plant and Soil Science or consent of instructor. 2 hrs and 1 lab. F

413 Soil Chemistry (3) Principles concerning structure and properties of soil materials; sorption of chemical substances. Prerequisites: completion of soil physical and chemical properties, classification. 3 weekend field trips. Prerequisite: consent of instructor. F

414 Soil, Land, Use, and the Environment (3) Soil as an environmental component and soil properties affecting land use. Soil as a resource in development planning: consideration of noninferring aspects of site selection for land use, soil survey and resource data in land use, recognition and prevention of soil pollution. Prerequisite: 210 or consent of instructor. Sp, A

415 Soil Hydrology (3) Physical relationships among solid, liquid, and gaseous phases of soil systems. Relationships of soil properties to processes governing transport of water, and chemicals in soil. Prerequisite: Introduction to Soil Science. 2 hrs and 1 lab. F

431 Crop Physiology and Ecology (3) Principles of plant physiology as applied to crop production. Effects of environmental factors on physiological processes. Prerequisite: 230, Botany 321. 2 hrs and 1 lab. F, A

432 Bioclimatology (3) Solar energy budget; interactions between global, regional and local climates and biomes. Weather and climate systems: interaction of macro- and microclimates; micrometeorological and atmospheric conditions. More than one semester. 2 hrs and 1 lab. F

433 Agricultural Pesticides (3) Regulation of pesticide development, manufacture, transportation, marketing and use. Structure, use, mode of action, degradation and environmental impact of pesticides used in agriculture, forestry and related areas. Prerequisite: 1 yr biological sciences and 1 semester chemistry. 2 hrs and 1 lab. Sp

434 Postharvest Biology and Technology (3) Principles, methods, and techniques related to maintenance of quality of horticultural commodities. Prerequisite handling and processing techniques. Evaluation of statistical and biological methods and the relationship between statistical significance and biological importance. 2 hrs and 1 lab. Sp

451 Seminar Preparation (1) Application of statistics to interpretation of laboratory research. Notation, descriptive statistics, probability, distributions, confidence intervals, and chi-square tests, analysis of variance, mean separation procedures, linear regression and correlation. Prerequisite: Mathematics 121 or equivalent. F

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

501 Seminar Preparation (1) Application of speaking, writing, and organizational skills in preparation and presentation of scientific papers. Preparation of abstracts for scientific presentations. Required of all entering graduate students during their first year of graduate study. F, Sp

502 Registration for Use of Facilities (3-15) Required for use of laboratory facilities in courses and programs. May be repeated. S/N C only. E

503 Seminar (1) Presentations and discussion of current scientific material. May be repeated. Maximum 3 hrs. F, Sp

511 Advanced Soil Fertility (3) Concepts of soil chemistry as related to nutrient movement and adsorption by plant roots. Fertilizer efficiency and measurement of plant response factors. Prerequisite: 413. Sp, A

512 Pedology (3) Physical and chemical weathering processes, factors of soil formation, soil forming processes. Prerequisite: 412 or consent of instructor. 2 hrs and 1 lab. F, A

514 Advanced Soil Physics (3) Theory and mathematical modeling of flow and solute transport in saturated and unsaturated soils; geostatistical analysis of soil heterogeneity. Prerequisites: completion of soil physical and chemical properties, classification. 3 weekend field trips. F


571 Design and Analysis of Biological Research (3) (Same as Animal Science 571).

593 Special Problems in Plant and Soil Science (1-3) May be repeated. Maximum 6 hrs. E

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

601 Special Topics in Soil Science (1-3) Thermodynamics of soil solutions, clay structure and surface chemistry, soil mineralogy, plant mineral nutrition, soil microbiology, water movement and use by plants, soil structure, soil thermal properties, interaction in the soil-plant environment. May be repeated. Maximum 6 hrs. E

603 Special Topics in Crop Physiology and Ecology (1-3) Thermodynamics of soil solutions and surface chemistry of soils; solute transport in the soil and plant environment. May be repeated. Maximum 6 hrs. E

613 Advanced Soil Chemistry (3) Thermodynamics of soil solutions and surface chemistry of soils; solute transport in the soil and plant environment. May be repeated. Maximum 6 hrs. E

631 Advanced Crop Physiology (3) Relationship of physiology of crops and environments and stress tolerances. Nitrogen fixation, photosynthetic and respiratory processes. Prerequisite: Consent of instructor. Sp, A

633 Plant Growth Control and Herbicide Action (3) Principles of uptake, translocation, mode of action and utilization of herbicides and plant growth regulators and their effects on plant morphology, metabolic systems and enzymatic activities. Practical aspects and current commercial uses of plant growth regulators. Prerequisite: Botany 521 and 522 or equivalent. F, A

634 Plant Growth Control and Herbicide Action (3)
Political Science
(College of Arts and Sciences)

MAJORS

DEGREES

Political Science .................................. M.A., Ph.D.
Public Administration .............................. M.P.A., J.D.-M.P.A.

Patricia Freeland, Acting Head

Professors:

Carlisle, D. H. (Emeritus), Ph.D. ................. North Carolina
Cunningham, Robert B., Ph.D. ............... Indiana
Fitzgerald, Michael R., Ph.D. .................... Oklahoma
Gant, Michael M., Ph.D. ...................... Michigan State
Gorman, Robert A., Ph.D. ...................... New York
Lyons, William, Ph.D. .......................... Oklahoma
Peters, John, Ph.D. ............................. Illinois
Plaas, Hyram, Ph.D. ............................. Utah
Robinson, Neilson M. (Emeritus), Ph.D. ............ Oregon
Richards, Otis H. (Distinguished Prof.), Ph.D. ........ New York
Small, Harry, Ph.D. .............................. Kansas
Wright, David, Ph.D. ............................. Missouri

Associate Professors:

Evans, Gill C., Ph.D. ............................. California
Folz, David H. (Liaison), Ph.D. ................. Tennessee
Freeland, Patricia K. (Liaison), Ph.D. ............. Wisconsin (Milwaukee)
Houston, David J., Ph.D. ........................ SUNY (Binghamton)
Peterson, Robert L., Ph.D. ....................... Yale

Assistant Professors:

Bereikjian, Jeffrey D., Ph.D. .................... Oregon
Bowers, Anthony J., Ph.D. ..................... Kansas
Richardson, Lilliard, Ph.D. ..................... Texas
Salinger-McBride, Jan., Ph.D. ...................... California (Santa Barbara)
Zhong, Yang, Ph.D. .............................. Kentucky

Professor Emeriti:

Breeding (4) Animal Science
Cunningham (4) Animal Science
Kendall (4) Plant Science

The Department of Political Science offers the M.A., M.P.A., and Ph.D. The department also offers a dual program with the College of Law leading to the J.D. degree for successful completion of approved graduate level courses (500 or 600 level) offered in the Department of Political Science. The M.P.A. program will award a maximum of 9 semester hours of credit toward the J.D. degree for successful completion of approved graduate level courses (500 or 600 level) offered in the Department of Political Science. All candidates for the dual degree must successfully complete Administrative Law (Law 821) and are encouraged to take Local Government (Law 824). An internship is strongly recommended for students in the dual degree program, as it is for all M.P.A. candidates, but an internship is not required.

ADMISSION REQUIREMENTS

Three departmental recommendation forms must be submitted to The Graduate School, at least two of which must be completed by instructors at the institution most recently attended. In addition, scores on the general portion of the Graduate Record Examination must be submitted.

THE MASTER OF ARTS PROGRAM

A Bachelor's degree or its equivalent is required for admission. Normally an average of 3.0 is also required together with an average of 3.2 in the last two years of political science or social science. In addition, a composite score of at least 1100 on the verbal and quantitative parts of the GRE is normally required.

Students pursuing the Master of Arts degree may follow one of two options:

Thesis Option: (30 hours) Coursework, preparation of a thesis, and an oral examination on coursework and thesis, is required. At least 12 of these hours must be in political science, with 6 in the field of methodology (Political Science 510 and either 511 or 512). Six hours may be earned through thesis credit.

Non-Thesis Option: (36 hours) Coursework, plus a written comprehensive examination on all coursework is required. At least 12 of these hours must be in political science, with 6 in the field of methodology (Political Science 510 and either 511 or 512), and 3 hours in the 600-level research seminar in the student's first field of interest.

THE MASTER OF PUBLIC ADMINISTRATION PROGRAM

The M.P.A. program is intended to prepare students for public service careers by acquainting them with management principles, analytical tools, and the ethical dilemmas they will face as public administrators. It consists of a total of 39 semester hours, including a core program, an elective specialization and a recommended internship.

Applicants for admission to the program must have a Bachelor's degree or its equivalent. Normally, an average of 3.0 and an average of 3.2 in the last two years of political science or social science courses is required. In addition, a composite score of at least 1100 on the verbal and quantitative parts of the GRE is normally required.

Students must demonstrate proficiency in the use of personal computers prior to the completion of 9 credit hours in the M.P.A. program. Students may fulfill this requirement by successful completion of a short course(s) offered by the UT Computing Center. The Coordinator of the M.P.A. program will provide a list of acceptable courses. Exceptions to this requirement will be considered on an individual basis.

The M.P.A. is a non-thesis program. Specific requirements include the following:

1. Core - 21 hours.
   b. Analytical skills (6 hours): 512 Quantitative Political Analysis; 514 Research and Methodology in Public Administration.
   c. Management skills (6 hours): 560 Public Budgeting; and either 562 Public Management or 564 Human Resource Management in Public Administration.

2. Specialization - 9 hours.
   A specialization is designed by the student in consultation with the coordinator of the M.P.A. program. Possible specializations include general government, public health, budgeting and finance, planning, natural resources, program evaluation, criminal justice, public relations, personnel, and others.

3. Recommended internship with a public agency - 6 hours.

Internships are arranged in consultation with the coordinator of the M.P.A. program.

4. A written final examination, which may be followed by an oral examination, is required.

DUAL J.D.-M.P.A. PROGRAM

The College of Law and the Department of Political Science in the College of Arts and Sciences offer a coordinated dual degree program leading to the concomitant of both the Juris Doctor (J.D.) degree and the Master of Public Administration degrees. In this program, a student may earn the M.P.A. and J.D. degrees in about four years rather than the five years that otherwise would be required. Students pursuing the dual degree program should plan to be enrolled in coursework or an internship for one summer term in addition to taking normal course loads for four academic years.

Admission

Applicants for the J.D.-M.P.A. program must make separate application to, and be independently accepted by, the College of Law for the J.D. degree and the Department of Political Science and The Graduate School for the M.P.A. degree. Applicants must also be accepted by the Dual Degree Committee. All applicants must submit a Law School Admission Test (LSAT) score. An applicant's LSAT score may be substituted for the Graduate Record Examination (GRE) score, which is normally required for admission to the M.P.A. program. Application may be made prior to or after matriculation in either the J.D. or the M.P.A. program, but application to the dual program must be made prior to entry into the last 29 semester hours required for the J.D. degree and prior to entry into the last 15 hours required for the M.P.A. degree.

Curriculum

A dual degree candidate must satisfy the requirements for both the J.D. and the M.P.A. degrees, as well as the requirements for the dual program. The College of Law will award a maximum of 9 semester hours of credit toward the J.D. degree for successful completion of approved graduate level courses (500 or 600 level) offered in the Department of Political Science. The M.P.A. program will award a maximum of 9 semester hours of credit toward the M.P.A. degree for successful completion of approved courses offered in the College of Law. All courses for which such credit is awarded must be approved by the J.D.-M.P.A. coordinators in the College of Law and the Department of Political Science. All candidates for the dual degree must successfully complete Administrative Law (Law 821) and are encouraged to take Local Government (Law 824). An internship is strongly recommended for students in the dual degree program, as it is for all M.P.A. candidates, but an internship is not required.

During the first two years in the dual program, students will spend one academic year completing the required first year of the College of Law curriculum and one academic year taking courses solely in the M.P.A. program. During those first two years, students may not take courses in the opposite area, without the approval of the J.D.-M.P.A. coordinators in both academic units. In the third and fourth years,
students are strongly encouraged to take both law and political science courses each semester.

Dual degree students who withdraw from the program before completion of the requirements for both degrees will not receive credit toward either the J.D. or the M.P.A. degree for courses taken in the other program except as such courses qualify for credit without regard to the dual program.

Awarding of Grades
For grade recording purposes in the College of Law and the Department of Political Science, grades awarded in courses in the other unit will be converted to either Satisfactory or No Credit and will not be computed in determining a student's GPA or class standing. The College of Law will award a grade of Satisfactory for an approved M.P.A. course in which the student earns a grade of B or higher and a grade of No Credit for any lower grade. The Political Science Department will award a grade of Satisfactory for an approved law course in which the student earns a grade of 2.3 or higher and a grade of No Credit for any lower grade. The official academic record of the student maintained by the Registrar of the University shall show the actual grade assigned by the instructor without conversion.

THE DOCTORAL PROGRAM
The Ph.D. program prepares students for careers in college teaching, as well as careers in other occupations related to service in the public or private sectors. Applicants for admission to the program should normally have completed a master's degree in political science or a related field with a 3.5 GPA and have completed a course numbered above 500.

For the Ph.D. degree, students are strongly encouraged to take both law and political science courses each semester. Doctoral students admitted to the program must complete 84 hours beyond the bachelor's degree, including 24 hours of coursework beyond the master's degree, graded A-F, must successfully pass written and oral comprehensive examinations in three broad subfields of political science, and must pass a final oral examination on the dissertation.

In addition, students must satisfy a research tool requirement. Usually, students meet this requirement by completing 12 hours of coursework numbered above 500 in empirical research and methodologies. However, if a student's advisor and program committee certify that competency in a foreign language is a more appropriate research tool, a foreign language course may be used instead.

In addition to the total hours required for the degree, the following requirements must also be met:
1. At least 69 hours must be in political science courses.
2. At least 54 hours in political science must be in courses numbered above 500.
3. Completion of Political Science 510, 511, 512.
4. Completion of at least three courses or seminars at UTK in each of the three broad subfields in which the student takes examinations.
5. Completion of at least one course or seminar in each of six broad subfields available for graduate instruction in the department.
6. At least 6 hours must be earned in political science courses numbered above 500.

7. A total of 24 hours must be earned by writing the dissertation.

MINOR IN ENVIRONMENTAL POLICY
The department participates in a program designed to give master's level graduate students an opportunity to develop an interdisciplinary specialization in environmental policy. See Economics for program description.

GRADUATE COURSES
430 United States Constitutional Law: Sources of Power and Restraint (3) Analysis of judicial review, constitutional powers of President and Congress, federalism, sources of regulatory authority, and constitutional protection of political and economic rights.
431 U.S. Constitutional Law: Civil Rights and Liberties (3) Analysis of current issues in civil rights and liberties including First Amendment freedoms, equal protection, privacy and rights of accused.
442 Administrative Law (3) Legal dimensions of administrative power and procedures, and constitutional controls over administrators.
452 Black African Politics (3) Recent evolution and current political environment of Black African nations. (Same as Afro-American Studies 452.)
454 Government and Politics of China and Japan (3) Examination of the political setting, structure and political processes in China and Japan.
455 Latin American Government and Politics II (3) Selected topics on Latin American political dynamics, consideration of leading theoretical explanations. (Same as Latin American Studies 455.)
459 Government and Politics of the Soviet Union (3) Origins and development of Soviet political system, and study of selected policy areas.
461 Policy Making in Democracies (3) Comparative approach to theory and process of making public policy.
463 Contemporary Middle East Politics (3) Governments and movements in Middle East, their characteristics, bases, and interrelationships.
470 International Law (3) Nature and development of international law and compliance. Function of international law in international conflict.
475 Ancient and Medieval Political Thought (3) Survey of major western political thinkers from Socrates to Marquis of Pombal. 476 Modern Political Thought (3) Survey of major western political thinker from Machiavelli to Marx.
500 Thesis (1-15) P/NP only. E
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/N/C only. E
510 Scope and Methods in Political Science (3) Procedures of analysis in political science.
511 Research Design (3) Methods for planning and executing research, from case studies to experimental designs: development of research questions and hypotheses; measurement issues; and validity of inferences.
512 Quantitative Political Analysis (3) Methods and techniques in quantitative analysis: univariate and bivariate statistics.
513 Quantitative Political Analysis (3) Methods and techniques in quantitative political analysis: multivariate model building.
514 Research and Methodology in Public Administration (3) Basic assumptions and techniques of research in public administration; measurement, analysis, and reporting of data. 520 Political Theory (3) Survey of major ideas, thinkers and works of Western political theory.
522 American Political Thought (3) Systematic examination of the normative and empirical theories of leading American political thinkers from the colonial period to the present.
530 American Government and Politics (3) Survey of literature, approaches to research and analysis, critical evaluation of major works, assuming research in various subfields. May be repeated with consent of department. Maximum 9 hrs.
532 Presidency (3) Systematic examination of the structure, functions and powers of the American presidency as they have evolved from the founding to the present.
533 Congress (3) Formal, empirical and theoretical approaches to models of the institutional workings of Congress and the behavior of legislators.
535 Mass Political Behavior (3) Theoretical and empirical analyses of public opinion, political socialization, political attitudes and behavior, especially voting behavior.
537 Political Parties and Interest Groups (3) Theoretical and empirical examination of the structure, functions and operations of political parties and interest groups.
539 State and Local Government and Politics (3) Theoretical and empirical analysis of government, politics, policy making and public administration at the state and local levels.
540 Public Law (3) Selective examination of published research and current approaches in subfields of constitutional law, judicial process, and judicial behavior. May be repeated with consent of department. Maximum 9 hrs.
546 Law and the Administrative Process (3) Constitutional position, decisional processes, regulation and management, limitations on governmental action; questions of structure, role, and administrative choice. May be repeated with consent of department. Maximum 9 hrs.
548 Public Policy Process (3) Theoretical, formal and empirical analysis of the roles, functions and decision making processes of public policymakers, including legislative, executive and judicial actors.
550 Public Administration (3) Overview of public administration theory and function.
552 Organization Theory (3) Appraisal of major theories of organization and their applicability to public sector.
553 Management of Information Systems (3) Theory, design, development, implementation and evaluation of information systems in public organizations. Database systems, computer applications related to effective management information technology.
556 Policy Analysis (3) Strategies and techniques for identification and analysis of public problems and policy solutions. May be repeated with consent of department. Maximum 9 hrs.
558 The Politics of Administration (3) Examination of public administration in context of American political system, policy making and roles of public administrators and agencies. May be repeated with consent of department. Maximum 9 hrs.
560 Public Budgeting and Finance (3) Technical and political aspects of planning, preparation and adoption of government budgets. Management implications of revenue collection, debt management, treasury function, accounting, internal auditing, purchasing, risk management, post-auditing.
562 Public Management (3) Interpersonal and leadership skills, techniques and methods for planning, decision making, and implementation of management strategies in public sector. May be repeated with consent of department. Maximum 9 hrs.
564 Human Resource Management in Public Organizations (3) Intensive analysis of contemporary issues, challenges, methods and techniques related to effective management of human resources in public sector.
566 Ethics, Values, and Morality in Public Administration (3) Moral-ethical-value dilemmas confronting administrators in American political system.
569 Internship in Public Administration (3-9) Open to students participating in approved internship programs. May be repeated with consent of department. Maximum 9 hrs. S/N/C only.
Polymer Engineering
See Materials Science and Engineering

Psychoeducational Studies
(College of Education)

MAJORS DEGREES
Education ........................................ Ph.D.
Educational Psychology ............................. M.S., Ed.D.
Educational Psychology and Guidance .......... Ed.S.

K. Greenberg, Leader

Professors:
Bellen, Jerry J. (Emeritus), Ed.D. ...... UC Berkeley
Cameron, Walter A., Ph.D. ............... Ohio State
Dickinson, Donald J., Ed.D. .............. Oklahoma State
George, Thomas W., Ed.D. ............... Tennessee
Greenberg, Katherine H., Ph.D. .......... George Peabody
Kasworm, Carol, Ed.D. ..................... Georgia
McCallum, R. S., Ph.D. ..................... Georgia
Peters, John M., Ed.D. ....................... NC State
Williams, R. L. (Liaison), Ph.D. ...... George Peabody

Associate Professors:
Brockett, Ralph G., Ph.D. ................ Syracuse
Kindall, Luther M., Ed.D. ............... Tennessee

Assistant Professor:
Whitaker, Dianne, Ph.D. ................ Washington

The Psychoeducational Studies unit offers graduate programs leading to the following:
- Master of Science with a major in Educational Psychology
- concentrations in adult education, educational psychology, and individual and collaborative learning
- Educational Specialist with a major in Educational Psychology and Guidance
- concentrations in educational psychology and school psychology
- Doctor of Education with a major in Educational Psychology
- concentrations in adult education, educational psychology, and collaborative learning
- The unit also participates in the college-wide Ph.D. program with a major in Education. See Education under Fields of Instruction for full description of all degree requirements.

The mission of the Psychoeducational Studies unit is to provide national leadership in creating learning environments that foster psychological health, address authentic educational needs, and promote life-long learning.

The school psychology program is accredited by the American Psychological Association and the National Association for School Psychology. This program also has the approval of the National Council for Accreditation of Teacher Education. The program in Educational Psychology has been recognized as a "Designated Program" by the American Association of State Psychology Boards and the Council for the National Register of Health Service Providers in Psychology.

ADMISSION REQUIREMENTS

Admission requirements include up-to-date scores from the GRE, the unit admissions application form and letters of recommendation. For the doctoral programs a writing sample is also required. The application deadline for admission to the doctoral and Ed.S. programs is February 1, and to the M.S. program is February 1 and November 1. For information about the various programs of study and admissions, write to the Graduate Center in the College of Education.

GRADUATE COURSES

432 The Disadvantaged Student: Psychoeducational Perspectives (3) Theory and research regarding emotional, social, and intellectual development over lifespan with applications to educational and therapeutic settings. F,Sp

460 Self-Management in the Helping Professions (3) Applications of self-management strategies to career, social, emotional, and health domains for both helping professionals and their clientele. Prereq: Introductory course in psychology or consent of instructor. S/NC or letter grade. Sp, Su

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

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


504 Special Topics (1-3) Instructor-initiated course offered at convenience of unit on topics of current interest. May be repeated. Maximum 15 hrs. S/NC or letter grade. E

509 Internship in Adult Education (3) Practicall field experiences in selected settings under supervision of practitioner and departmental representative. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. Sp, Su

510 Psychological Theories of Human Development Applied to Education (3) Theory and research on emotional, social, and intellectual development over lifespan with applications to educational and therapeutic settings. F

511 Cognitive Development: Implications for Education (3) Applications of theory and research related to higher mental problem-solving. Prereq: 510 or consent of instructor. F

513 Reflective Practice in Education and Psychology (3) Concepts, theories and processes of reflective practice applied to educational settings.

514 Individual Study in Adult Education (3) Prereq: Consent of supervising instructor. Approval form must be completed in office of unit head. May be repeated. Maximum 6 hrs. E

515 Educational Applications of Behavioral Theories of Learning (3) Behavioral theories and research, conditioning, observational learning, and ethological learning as systems applied to student motivation, discipline, and learning. F, Su

516 Educational Applications of Cognitive Learning Theories (3) Cognitive theory and research, social learning, attribution and information processing as systems apply to education. Prereq: 515 or consent of instructor. F

518 Educational Specialist Research and Thesis (3) May be repeated. P/NP only. E

570 Comparative Government and Politics (3) Selected topics in modern governments. May be repeated with consent of department. Maximum 9 hrs.

572 The Politics of Development (3) Selected topics dealing with political problems of less developed countries. May be repeated with consent of department. Maximum 9 hrs.

574 Area Seminar in Comparative Government and Politics (3) Selected topics in area studies: African, Asia, Latin America, Middle East, Soviet Union and Eastern Europe, Western Europe. May be repeated with consent of department. Maximum 9 hrs.

580 International Politics (3) Survey of literature and major aspects of international politics. May be repeated with consent of department. Maximum 9 hrs.

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

582 Field Study (1-15) See College of Arts and Sciences.

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

589 Readings and Special Problems in Political Science (1-3) Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

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

615 Formal Political Analysis (3) Assumptions, methodology (3) Advanced methods and procedures of analysis in political science. May be repeated with consent of department. Maximum 9 hrs.

617 Comparative Public Administration (3) Development of theory and mathematical modeling. May be repeated with consent of instructor. Maximum 9 hrs.

618 Topics in Political Theory (3) Selected issues and problems in normative political theory. Specific content determined by instructor. May be repeated with consent of instructor. Maximum 9 hrs.

628 Topics in Public Administration (3) Development of theory in public administration: contemporary critiques and alternatives. May be repeated with consent of instructor. Maximum 9 hrs.

639 Special Topics in American Government and Politics (3) Advanced study of selected topics. May be repeated with consent of instructor. Maximum 9 hrs.

640 Special Topics in U.S. Constitutional Law (3) Systematic analysis of published research and judicial decisions. Development of constitutional law as major component of public policy. May be repeated with consent of department. Maximum 9 hrs.

642 The Politics of Criminal Justice (3) Selective examination of contemporary problems of research and public policy formulation: constitutional process; law enforcement administration; criminal court administration; and prison administration. May be repeated with consent of department. Maximum 9 hrs.

644 The Politics of Social Welfare (3) Selected issues and problems in social welfare policies. Specific content determined by instructor. May be repeated with consent of department. Maximum 9 hrs.

646 Comparative and International Public Administration (3) Development of theory in international public administration: contemporary critiques and alternatives. May be repeated with consent of instructor. Maximum 9 hrs.

647 Comparative Public Administration (3) Comparison of policy-making structures and public policies in selected countries. May be repeated with consent of department. Maximum 9 hrs.

668 Special Topics in Public Administration (3) Analysis of selected issues and problems in public administration. May be repeated. Maximum 9 hrs.

670 Special Topics in Comparative Government and Politics (3) Research into selected topics. May be repeated with consent of department. Maximum 8 hrs.

682 Theory and Analysis of U.S. Foreign Policy Processes (3) Theoretical approaches to decision making in foreign policy area and analysis of policy-making process. May be repeated with consent of department. Maximum 9 hrs.

688 Special Topics in International Politics (3) Selected issues and problems in international politics. Specific content determined by instructor. May be repeated with consent of instructor. Maximum 9 hrs.
520 Survey of Adult Education (3) Historical development, philosophies of adult education agencies, associations, programs, issues, and literature illustrating process of adult education and diversity of continuing education. Prereq: Consent of instructor. F,Su

521 Program Development and Operation in Adult Education (3) Theories and methods from research to practice in planning and operating adult education programs. Prereq: Consent of instructor. F,Su

522 Adult Development (3) Changes in characteristics of adults over lifespan and implications for adult education. Prereq: Consent of instructor. F,Su

523 Post-Secondary Education for Adults (3) History, evolution, philosophy, structure and functions of post-secondary, sub-university institutions, their programs and clientele. Prereq: Consent of instructor. Sp,Su

524 Continuing Professional Education (3) Theories and concepts supporting design and management of educational programs for adults in professions. Prereq: 520 or equivalent. Sp

525 Characteristics of Adult Learners (3) Key characteristics of adult learners, and applications to teaching and learning contexts.


527 Controversies in Adult Education (3) Controversies confronting field of adult education; development of critical analysis skills by looking at controversies from different perspectives.

540 Seminar in School Psychology (3) Essentials of theory and practice of school psychology as professional specialty. Consideration of history and current issues in school psychology.

541 Psychoeducational Assessment (3) Direct, psychometric and naturalistic assessment methods in learning environments. Prereq: 521 or equivalent. Sp

542 Practicum in Psychoeducational Assessment (3) Application of assessment skills to clients in learning environments. Coreq: 541 or consent of instructor. May be repeated. Maximum 6 hrs. F,Sp

543 Psychoeducational Consultation (3) Use of two and three-person models of consultation in educational and therapeutic settings. Prereq: 521 or equivalent. F

544 Practicum in Consultation (3) Application of consultation skills to educational settings. Prereq: 543. Sp

545 Internship in School Psychology (1-6) Supervised employment in unit approved school psychology internship sites. Prereq: Enrollment in school psychology program and consent of instructor. May be repeated. Maximum 12 hrs. S/N only. E

560 Discipline and Conflict Resolution (3) Applications of major models of discipline and conflict resolution strategies in development of constructive atmosphere for classroom learning.

571 Mediated Learning Theory (3) Feuerstein's theory of mediated learning experience and its connections to work of Piaget, Vygotsky and others. Implications for transformational learning and building of learning communities for learners of all ages.

572 Cognitive Education: Models and Approaches (3) Models and approaches in field of cognitive education: research and theoretical support for various program components, critical variables of organizational learning that affect success of implementation.


593 Independent Study (1-3) May be repeated. S/N or letter grade. E

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

602 Directed Research (1-3) Instructor or student-initiated group research leading to the development of empirical and theoretical problems in educational and counseling psychology. May be repeated. Maximum 12 hrs. S/N only. E

604 Special Topics (1-3) Instructor-initiated courses offered for credit on topics of interest. May be repeated. Maximum 15 hrs. S/N or letter grade. E

609 Advanced Seminar in Curriculum and Learning (4) Team-taught interdisciplinary seminars on trends, themes, and issues in curriculum and learning. Reading and discussions based on significant research and scholarly publications.

620 Seminar in Adult Education (3) Issues in adult education, theories and concepts, historical perspectives, research trends and methodologies. Prereq: 520 or equivalent.

621 Advanced Seminar in Program Planning (3) Concepts, principles, and theories related to program planning in adult education. Prereq: 521 or equivalent. Sp

622 Advanced Seminar in Adult Development (3) Adult development research. Designing research for studies of life cycle. Prereq: 522 or equivalent. Sp

628 Adult Problem Solving and Learning (3) Contemporary research and theories in adult problem-solving and learning. Prereq: 522 or equivalent. F,Su

535 Ethical, Legal, and Professional Issues in Psychology (3) (Same as Psychology 635 and Counselor Education and Counseling Psychology 635.) Sp

649 Advanced Internship in School Psychology (1-9) Supervised experience as school psychologist in unit-approved internship sites for doctoral level students. Prereq: Enrollment in doctoral level school psychology program and consent of instructor. May be repeated. Maximum 9 hrs. S/N only. E

650 Professional Practice in School Psychology (1) Field setting to facilitate academic, social and interpersonal development of children and adults. School and mental health settings for intervention, consultation, prevention, and assessment services. May be repeated. Maximum 9 hrs. S/N only. E

652 Professional Practice in School Psychology (1) Field setting to facilitate academic, social and interpersonal development of children and adults. School and mental health settings for intervention, consultation, prevention, and assessment services. May be repeated. Maximum 9 hrs. S/N only. E

653 Scale Construction (3) Development, piloting, and revision of attitude inventories, rating scales, and other paper-and-pencil techniques for assessing beliefs, personality characteristics, and opinions. Prereq: Counselor Education and Counseling Psychology 525, and two-course sequence in statistical analysis. A

655 Research in Psychoeducational Studies (1) Data analyses, collection, and interpretation. May be repeated. Maximum 9 hrs. S/N only. E

656 Scale Construction (3) Development, pilot testing, and revision of attitude inventories, rating scales, and other paper-and-pencil techniques for assessing beliefs, personality characteristics, and opinions. Prereq: Counselor Education and Counseling Psychology 525, and two-course sequence in statistical analysis. A

658 Practicum in Instructional Planning (3) Development and management of course or program of instruction in educational psychology. Prereq: 565 or consent of instructor. E

669 Internship in Educational Psychology (1-6) Supervised employment in unit approved educational psychology internship sites. May be repeated. Maximum 12 hrs. S/N only. E

985 Educational Leadership: Theory and Practice (3) Theories of leadership applied to variety of educational settings. Prereq: Consent of instructor. F,Su

983 Independent Study (1-3) May be repeated. S/N or letter grade. E


Psychology (College of Arts and Sciences)

MAJOR

Psychology ..........................................M.A., Ph.D.

Warren H. Jones, Head

THE MASTER'S PROGRAM

Graduate study leading to the M.A. degree in psychology is available with a concentration in experimental psychology. This program is appropriate for students who desire a master's degree as part of their progress toward a doctorate or for those who wish to complement a degree in a different field.

Admission

Any student with a B.A. or B.S. may apply to the Department of Psychology for admission to the master's program. All students must also submit scores from the Graduate Record Examination (general and subject).

Major Advisor and Committee

Initially, the Director of Experimental Psychology will advise the student. As soon as possible, the student must select an advisor and obtain his or her approval for registration. Subsequently, the advisor and student will select two additional faculty members to comprise the student's master's committee.

Final committee approval comes from the Graduate Dean, upon recommendation by the Department Head.

Program Requirements

All students must complete 30 semester hours of graduate level courses in psychology. These hours must include 504-05, or Statistics 531-32 or an equivalent sequence; 565 or 420; six semester hours of Thesis 500; and twelve
hours of 500- or 600-level foundation courses. Students must earn a grade of B or better in all courses that are to count toward the 30-hour total. Students must also propose, conduct and successfully defend an original piece of research in the form of a master's thesis.

THE DOCTORAL PROGRAM

A student with a B.A. or B.S. may apply to the Department of Psychology for admission to the doctoral program with a concentration in experimental psychology or clinical psychology. The doctoral program with a concentration in ethology or physiology is offered through the Life Sciences program. Doctoral study in industrial and organizational psychology is offered through the Intercollegiate program in Industrial and Organizational Psychology, to which application is made through the Department of Management.

Experimental Psychology

The Ph.D. program in Psychology with a concentration in experimental psychology is designed to allow the student to select from a variety of specializations oriented toward careers in research, teaching, and application of psychology in academic, institutional, or industrial settings. The program is flexible, individualized, and emphasizes a professional apprenticeship model of training. A full description of the program is given in the "Handbook for Students in Experimental Psychology," available from the department. The basic requirements are:

1. Twelve semester hours of statistics and research (504-05 or Statistics 531-32 or equivalent and 8 additional hours in research methods or design).
2. Fifteen semester hours in experimental psychology (565 or equivalent and 4 courses from the following: 510, 511 or 512, 513, 543, 546 or 547, 550, 560, and 570 or 571).
3. Six semester hours of research practicum (509).
4. Psychology 528 - preparation for college teaching.
5. Two 600-level graduate seminars.
6. Six semester hours of graduate level courses outside the Psychology Department.
7. Predissertation research project involving the collection of original data or the original analysis of existing data, reported in publishable form and accepted by the student's advisory committee.
8. An integrative review or theoretical paper, accepted by the student's advisory committee.
9. Comprehensive examination, determined and evaluated by the student's doctoral committee.
10. Twenty-four hours of dissertation research (600).
11. An original piece of research in the form of a doctoral dissertation, proposed, conducted, and defended.

Clinical Psychology

This program is designed to lay the groundwork for a career as a clinical psychologist capable of working both in academic and applied settings. The program emphasizes the theoretical foundations of psychology as well as supervised experience oriented toward the development of practical skills. The program embodies a model of clinical psychology in which practice and research are integrated.

Clinical program students must obtain a score of at least 630 on the GRE in psychology by the end of the first year and complete a predissertation research project by the end of the second year.

After forming the doctoral committee, students must then pass a comprehensive examination administered and evaluated by the committee. This examination is comprised of two papers, one addressing a topic of the student's choice, and the second addressing an understanding of one individual's personality and cognitive functions. All doctoral students must complete a minimum of 78 hours of graduate level courses, including courses required by their program; at least 6 hours in courses outside of psychology; and at least 24 hours of dissertation research (Psychology 600). Finally, students must complete an acceptable doctoral dissertation and conduct a satisfactory oral defense of the dissertation. Requirements are as follows:

a. Foundations of Psychology: Biological Factors, Perception, Learning, Thinking, Motivation (513);
   b. Interviewing and Observation (558) and Laboratory (559);
   c. Research Practicum (509) (4 hrs.);
   d. Life-Span Development (512) or Developmental Psychology (511);
   e. Personality: Theory and Research I and II (570-71);
   f. History and Systems of Psychology (565);
   g. Research Question and Design (560);
   h. Psychological Assessment I and II (554-95) and Laboratory (596);
   i. Experimental Methods in Psychology (504) and Research Design (565);
   j. Social Psychology (550);
   k. Field Placement in Clinical Psychology (685) (18 hrs.);
   l. Dynamics of Psychopathology (573);
   m. Psychometrics (555) or Applied Psychological Measurement (557);
   n. Ethical, Legal and Professional Issues in Psychology (655);
   o. Psychodynamic Psychotherapy I and II (670-71) and Laboratory (673) (4 hrs.);
   p. Doctoral Research and Dissertation (600) (24 hrs.).
5. Satisfactory completion of a one-year clinical internship at a site approved by the program.
6. Students who choose a teaching assistantship in the third or fourth year must have satisfactorily completed 528 College Teaching in Psychology.
7. Satisfactory completion of at least 3 additional graduate-level courses in non-clinical topics in psychology.
8. Satisfactory completion of a one-year clinical internship at a site approved by the program.

GRADUATE COURSES

409 Group Facilitation (3) Study of theory and technique through supervised experience in small groups. Prereq: 359 and consent of instructor. May be repeated. Maximum 6 hrs.
424 Psychology and the Law (3) Psychological aspects of legal systems. Prereq: 110 or equivalent, upper division standing and consent of instructor.
434 Psychology of Gender (3) Biological, psychological, and social factors in gender. Importance of gender roles and stereotypes for behavior and experience. Prereq: 110 or equivalent, 210, 220. (Same as Women's Studies 434.)
440 Organizational Psychology (3) Social-psychological analysis of organizations, role-theory and systems theory. Prereq: 360.
450 Comparative Animal Behavior (3) Same as Ecology and Evolutionary Biology 450.
459 Comparative Animal Behavior Laboratory (3) Corsec 450. (Same as Ecology and Evolutionary Biology 459.)
461 Physiological Psychology (3) Nervous system and physiological correlates of behavior. Biological basis of emotion, learning, memory and stress. Prereq: 110 or equivalent, 210, and 1 yr of biology or zoology introductory sequences or equivalents.
469 Laboratory in Physiological Psychology (3) Laboratory studies of nervous system and physiological correlates of behavior. Corsec 461.
470 Theories of Personality (3) Survey of major theories of human personality and their development. Prereq: 220 and 300 or 330.
473 Adolescent Development (3) Theoretical perspectives and empirical research findings pertinent to adolescent development. Prereq: Concepts in Psychology. Sp
480 Theories of Learning (3) Classical and current approaches to learning and cognition. Prereq: 310.
482 Topics in Psychology (3) Intensive analysis of special topics: Afro-American psychology or evaluation of programs in community. Prereq: Biological Basis of Behavior and Experience; Humanistic Psychology and at least 9 hrs in 300-level courses. Recommended prereq: Statistics in Psychology, Methods of
Research in Psychology. May be repeated. Maximum 6 hrs.

489 Supervised Research (1-9) Prereq: Consent of instructor. May be repeated. Maximum 12 hrs in 399, 489, 491, 492, and 493 combined may apply toward undergraduate major.

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

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


505 Research Design (3) Techniques for planning and conducting research in controlled and natural settings: experiments, quasi-experiments, observational studies, surveys, and program evaluations. Development of questions and hypotheses for study. Design of studies to maximize validity. Prereq: Consent of instructor. Sp

506 Readings and Special Issues in Psychology (1-3) Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. E

509 Research Practicum (1-3) Required of first-year graduate students in psychology. May be repeated. Maximum 9 hrs. S/NC only. E

510 Topics in Psychology (3) Intensive examination of selected issues in psychology. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

511 Developmental Psychology (3) Normal processes of human socialization; physical, cognitive, and emotional development from conception through infancy, childhood, and adolescence. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. F

512 Life-Span Development (3) Theories and research concerning normal human development throughout life, adulthood and old age. Prereq: Consent of Instructor.

513 Foundations of Psychology: Biological Factors, Perception, Learning, Thinking, Motivation (4) Intensive survey. Prereq: Consent of instructor.

515 Colloquium in Experimental Psychology (1) Research and practical issues in experimental psychology. Prereq: Consent of instructor. May be repeated. Maximum 4 hrs. S/NC only. F,Sp

516 Colloquium in Ethology (1) Current research and theory. May be repeated. Maximum 9 hrs. (Same as Ecology and Evolutionary Biology 516.) S/NC only. E

517-18 Proseminar in Industrial and Organizational Psychology (3,3) (Same as Management 567-568.)

520 Interventions for Behavioral Change (3) Principles and techniques for planning, implementing, and evaluating interventions derived from social learning theory. Interventions by people in community; teachers or supervisors. Computer economics and strategies for self-control. Prereq: Consent of instructor.

525 Laboratory Techniques and Instrumentation (3) Procedures for laboratory research involving humans and nonhuman animals; techniques for collecting, transforming, storing, and retrieving data using microcomputers. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

526 General Vertebrate Neuroanatomy (3) Lecture and laboratory. Structure and functioning of central and peripheral nervous system. Prereq: 461, 469, or equivalent and consent of instructor.

527 Behavioral Neurology (3) Disorders of nervous system, origin, diagnosis, and therapeutic treatment. Prereq: Consent of instructor.

528 College Teaching in Psychology (3) Concepts, techniques, and materials for teaching psychology at college and/or university level. Supervised practice. Prereq: Consent of instructor. S/NC only.


545 Advanced Animal Behavior (3) (Same as Ecology and Evolutionary Biology 545.)

546 Ethological Psychology (3) Basic ethological and comparative psychology, implications for human behavior. Prereq: Consent of instructor.

547 Conceptual Foundations of Evolution and Behavior (3) Critical evaluation of seminal writings on evolutionary theory and methodologies. Prereq: Consent of instructor. S

550 Social Psychology (3) Survey of theory and research concerning interpersonal interaction and individual behavior in social context. Prereq: Consent of instructor.

555 Psychometrics (3) Basic concepts: factor analysis, scaling, test theories, probability models and their applications, computerized adaptive testing and other topics. Prereq: Statistics 537-538 or equivalent. May be repeated. Maximum 6 hrs.

556 Psychopharmacology (3) Connections between pharmacology and psychology. Prereq: Consent of instructor.

560 Laboratory in Psychological Assessment (1) Prereq: Admission to doctoral program in clinical psychology or consent of instructor. Coreq: 559.

566 Personality: Theory and Research (3) Advanced survey of psychodynamic and neo-Freudian approaches to personality; related research. Prereq: Admission to clinical program or consent of instructor. Sp

570 Personality: Theory and Research I (3) Advanced survey of behavioral and humanistic approaches to personality; related research. Prereq: Admission to clinical program or consent of instructor.

572 Descriptive Psychopathology (2) Diagnostic criteria of the DSM-III. Examples from written case-histories and recorded interviews. Prereq: Admission to doctoral program in clinical psychology or consent of instructor. Sp

573 Dynamics of Psychopathology (3) Psychodynamic view of the causes and symptoms of major psychoses, neuroses, and adjustment disorders. Prereq: Admission to doctoral program in clinical psychology or consent of instructor. Sp

574 Atypical Development in Childhood (3) Research on etiologies of atypical patterns of development in infancy and childhood. Prereq: 511 and consent of instructor. May be repeated. Maximum 6 hrs.

575 Psychopharmacology (3) Connections between pharmacology and psychology. Prereq: Consent of instructor.

576 Plant Relations (3) European and American concepts of normal and psychopathological development of object relations. Significance for psychotherapy, psychodiagnosis, and psychotherapy. Prereq: Admission to doctoral program in clinical psychology or consent of instructor.

578 Clinical Aspects of Human Sexuality (3) Variation in human sexual behavior. Theories of etiology, treatment, prevention. Prereq: Consent of instructor.

580 Research Questions and Designs (3) Question-asking process in research and strategies or designs through which answers might be derived. Prereq: Admission to doctoral program in clinical psychology or consent of instructor.

585 Seminar in Clinical Psychology (3) S/NC only. Sp

589 Laboratory in Psychotherapy (2) Prereq: Admission to doctoral program in clinical psychology or consent of instructor. Coreq: 670 or 671. May be repeated. Maximum 6 hrs. S/NC only.

593 Independent, Off-campus, or Foreign Study (1-15) Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

594 Psychological Assessment I (3) Basic concepts and techniques of adult assessment: intelligence tests and personality tests. Prereq: Admission to doctoral program in clinical psychology or consent of instructor.

595 Psychological Assessment II (3) Basic concepts and techniques of adult assessment, intelligence tests and personality tests. Prereq: Admission to doctoral program in clinical psychology and Sp or consent of instructor.

596 Laboratory in Psychological Assessment I (3) Prereq: Admission to doctoral program in clinical psychology or consent of instructor. May be repeated. Maximum 4 hrs. S/NC only. Sp

597 Evaluation of Development in Childhood (3) Structured and projective tests and interview techniques for evaluation of intellectual, personality, and social development in childhood. Prereq: 511 and admission to doctoral program in clinical psychology or consent of instructor. May be repeated. Maximum 12 hrs.

600 Doctoral Research and Dissertation (1-15) P/NP only. E

601 Seminar in Psychology (3) Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.

610 Seminar in Applied Psychology (3) Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.

611 Seminar in Developmental Psychology (3) Prereq: 511 and consent of instructor. May be repeated. Maximum 12 hrs.

613 Seminar in Existential-Phenomenological Psychology (3) Prereq: Consent of instructor. May be repeated. Maximum 12 hrs.


622 Seminar in Comparative and Ethological Psychology (3) Prereq: 546 or consent of instructor. May be repeated. Maximum 12 hrs.

623 Seminar in Methods of Naturalistic Research (3) Prereq: 546 or consent of instructor. May be repeated. Maximum 12 hrs.

625 Seminar in Organizational Psychology (3) (Same as Management 625.)

626 Seminar in Industrial Psychology (3) (Same as Management 626.)

627 Seminar in Applied Industrial Psychology (3) (Same as Management 627.)

635 Ethical, Legal, and Professional Issues in Psychology (3) Research, human services, teaching and public policy. Prereq: Admission to doctoral program in psychology or consent of instructor. (Same as Counselor Education and Counseling Psychology 635 and Psychoeducational Studies 635.) S/NC only.

638 Current Topics in Industrial/Organizational Psychol- ogy (3) (Same as Management 638.)

670 Psychodynamic Psychotherapy I (3) Theories and principles. Prereq: Admission to doctoral program in clinical psychology or consent of instructor.

671 Psychodynamic Psychotherapy II (3) Theories and principles. Prereq: Admission to doctoral program in clinical psychology and 670 or consent of instructor. Sp

673 Laboratory in Psychotherapy (2) Prereq: Admission to doctoral program in clinical psychology or consent of instructor. Coreq: 670 or 671. May be repeated. Maximum 6 hrs. S/NC only.

676 Special Topics in Psychotherapy (3) Prereq: Admission to doctoral program in clinical psychology or consent of instructor. May be repeated. Maximum 12 hrs.

681 Seminar in Assessment (3) Prereq: Admission to doctoral program in clinical psychology or consent of instructor. May be repeated. Maximum 12 hrs.

683 Seminar in Behavioral Medicine (3) Current research and theory concerning relationships between...
Rehabilitation, Deafness, and Human Services

(see Department of Exceptional Education, Office of Special Education and Rehabilitation Services for programs sponsored by the U.S. Department of Education, Rehabilitation, Deafness, and Human Services unit includes several educational programs supported by the U.S. Department of Education, Office of Special Education and Rehabilitation Services, Rehabilitation Services Administration, including: Regional Rehabilitation Continuing Education Programs, Orientation to Deafness, Southeastern Regional Interpreters Training Consortium, National Interpreter Training Center, and the Educational Interpreting program.)

GRADUATE COURSES

415 Language Development of Hearing Impaired (3) Language problems of hearing impaired contrasted with scope and sequence of normal language development. Formal linguistic systems used to describe language development problems.

416 Language Development of Hearing Impaired II (3) Developmental and remedial systems of teaching language to hearing impaired children. Comprehension and production differences, idiomatic and figurative structures.

419 Speech Development of Hearing Impaired (4) Theories of speech development, approaches in training perception and production of speech, and aural habilitation. Practicum experiences.

423 Communication Processes for the Hearing Impaired (3) Expressive and receptive vocabulary development in sign communication. Fingerspelling and educational applications of sign language.

424 Nature of Hearing Impairments (3) Basic principles of audiology: anatomy and physiology of hearing; nature and causes of hearing loss; methods and instrumentation for assessment of hearing level; interpretation of audiologic services to medical and other rehabilitative disciplines.

425 Introduction to the Psychology and Education of the Hearing Impaired (3) For those planning to teach hearing impaired. Overview of research related to psychology, social adjustment, communication methodology, language development and education of hearing impaired. Survey of literature. Visits to programs.

482 Speech and Language Services in the Schools (3) Organization and implementation of speech and language programs in schools. IEP process as it affects assessment, case selection, and programming for students age 4-21. Consideration of instructional materials, group intervention, and consultation.

483 Clinical Practice in Communication Disorders in Schools (3) Supervised practice with children with communication disorders. Additional: 433, 434 (80-100 clinical contact hrs), 482.

500 Thesis (1-15) Only. E

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


504 Clinical Experience in Teaching an Assignment (3) (Same as Inclusive Early Childhood Education 504.)

509 Vocational Guidance and Career Planning (3) Reaction to the problem of careers, and resources and services for hearing impaired people to provide guidance in career decisions and individualized rehabilitation plan.

518 Educational Specialist Research and Thesis (3) May be repeated. P/NP only. E

523 Practicum in Hearing Impaired (3) Receptive and expressive language capabilities of hearing impaired student. Designing, teaching, and post-testing unit of instruction for remediation of specific language errors.

525 Manual Communication (3) (American Sign Language (ASL) and culture of American deaf community. Acquisition of basic language functions of ASL, cultural differences between hearing and deaf community, and vocabulary development. Prereq: Prior sign language experience prerequisite consent of instructor.

526 Advanced Sign Language (3) Intermediate ASL stressing fluency of expression and communication with deaf people and structure and history of language. Prereq: 525 or equivalent.


529 Teaching Reading to the Hearing Impaired (3) Specific methods necessary to teach the prelingually hearing impaired student. Preparation in practice of developmentally appropriate reading materials. Methods which assist in integrating hearing impaired students in regular reading curricula and materials. Prereq: 415.

530 Orientation to Rehabilitation (3) History, philosophical, legal and economic bases, current issues, and practices of public and private rehabilitation programs. Qualifications of service provider. Assessment, planning and provision of services to people who have disabilities and vocational handicaps. Identification, mobilization, and utilization of rehabilitation resources.

532 Casefinding Management in Rehabilitation (3) Techniques and procedures involved in management of cases of Federal-State vocational rehabilitation agencies, private rehabilitation companies, and public or private rehabilitation facilities. Analysis of appropriate industrial management models related to rehabilitation programs.

533 Job Analysis, Development, and Placement (3) Determining employment-readiness of people with disabilities. Identifying appropriate jobs for selected clients, and assisting clients in seeking, obtaining, and retaining employment. Development of job analysis and re-engineering techniques; legislation impacting job placement; supported work, and use of occupational information.

535 Vocational Evaluation: Statistical Methods (3) Process techniques and procedures used to determine vocational assets and liabilities of people with disabilities. Functional analysis of biographical and interview data; selection and application of relevant techniques and instruments; integration of data into diagnostic reports; application of computer-generated reporting systems.

537 Vocational Evaluation: Clinical Methods (3) Process techniques and procedures used to determine occupational and vocational potential. Selection and use of occupational exploration programs and work samples; application of situational tasks; job tryouts; and simplified work experiences in vocational evaluation. Clinical interpretation of data through formal staff conference, vocational counseling, and report writing.

539 Transition from School to Work (3) Development of programs and procedures to facilitate adjustment of exceptional students to independent living. Evaluation of educational assets, of effective programs, and interface between school-based programs and rehabilitation agencies.

541 Psychosocial Aspects of Exceptionalities (3) Psychosocial impact of exceptionalities on person and family. Coping with and loss, coping with disability, and societal rehabilitation.

543 Medical Disabilities (3) Medical problems and clinical problems related to disabling conditions served by special education and rehabilitation personnel. Emphasis on measures to facilitate diagnosis and minimization of existing handicaps. Skills necessary to communicate with lay and professional persons.

545 The Rehabilitation Interview (3) Interview as used in assessment and planning with people who have disabilities and vocational handicaps.
547 Practicum in Rehabilitation (3) Supervised experience in area of rehabilitation application of concepts, principles, and skills. Prereq: Consent of instructor.

549 Internship in Rehabilitation Counseling (12) Supervised practice in rehabilitation counseling. Full time clinical experience for second-year students (500 clock hrs required)

579 Special Topics (1-3) Prereq: Admission to graduate program. May be repeated. Maximum 9 hrs. S/NC or letter grade.

591 Clinical Studies (4) Relationship between educational theory and application during internship; research project, development of portfolio, and capstone experience.

592 Assistive Technology in Special Education and Vocational Rehabilitation (3) Technology as applied to needs of school age and post-secondary age students/clients. Delivery of assistive technology services; software programs and assistive devices; delivery systems, interdisciplinary evaluation/planning, and funding issues.

593 Independent Study (1-3) May be repeated. S/NC or letter grade. E

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

601 Seminar in Educational Theories in Special Education and Rehabilitation (3) Education theories: education and rehabilitation of exceptional persons. Theory applications in educational settings. Prereq: Admission to doctoral program or consent of instructor.

602 Seminar in Social Processes in Special Education and Rehabilitation (3) Social phenomena which influence impact of disability on person and on significant others. Implications for habilitation. Prereq: Admission to doctoral program or consent of instructor.

603 Seminar in Research in Special Education and Rehabilitation (3) Development and implementation of research. Independent research studies. Research proposals. Prereq: 9 hrs of research core and consent of instructor.

610 Internship in College Teaching and Supervision (3-9) Supervised practice in college teaching and supervision. Prereq: Admission to doctoral program or consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

620 Internship in Research in Special Education and Rehabilitation (3-9) Placement with professional engaged in theoretically-based research: public school, institutions, agencies or university settings. Prereq: 9 hrs in statistical and research methods. May be repeated. Maximum 9 hrs. S/NC only.

630 Internship in Institutional Leadership in Special Education and Rehabilitation (3-9) Advanced level field experiences under supervision of practitioner. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. S/NC only.

679 Special Topics (1-3) Prereq: Admission to doctoral program. May be repeated. Maximum 9 hrs. S/NC or letter grade.

693 Independent Study (1-3) May be repeated. S/NC or letter grade. E

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**Religious Studies**

(College of Arts and Sciences)

Charles H. Reynolds, Head

Professors:

Dungan, David L., Th.D. .............. Harvard
Humphreys, W. Lee, Ph.D. ........... Union
Linge, David E., (Liaison), Ph.D. .... Vanderbilt
Lusby, F. Stanley (Emeritus).
M.Div. ......................... Colgate Rochester
Norman, Ralph V., Jr., Ph.D. ........ Yale
Reynolds, Charles H., Ph.D. ......... Harvard

Associate Professors:

Fitzgerald, James L., Ph.D. ............ Chicago
Gwynne, Rosalind W., Ph.D. ........... Washington
Hackett, Rosalind J., Ph.D. .......... Aberdeen
Hodges, John O., Ph.D. ............... Chicago
Levinger, Mirtll M., Ph.D. ............. Harvard
Schmidt, G. Garde, Ph.D. .............. Pittsburgh

Assistant Professors:

Hulshizer, Mark, Ph.D. .............. Minnesota

A master's degree in Philosophy with a concentration in religious studies is available. (Details of this program are described under Philosophy.) Graduate courses in religious studies provide opportunity for students in a variety of disciplines to pursue work in religious studies as a graduate concentration.

**GRADUATE COURSES**

411 Modern Religious Philosophies (3) Religious implications of major Western thinkers and movements from Hospers of Cusan to twentieth-century German Idealists. (Same as Philosophy 411.)

412 Classical Indian Systems of Philosophy: The Moksha Tradition (3) Investigation of selected writings and philosophic problems of traditions of Samkhya, Yoga, Vedanta, Buddhism, or Jainism. Prereq: 374 or 376 or consent of instructor. (Same as Philosophy 412.)

416 Jesus and Paul Compared (3) Central ideas and concepts of each person compared with equivalent concepts in the other. Advanced study of Gospels and Epistles of Paul, involving extensive independent research.

425 Seminar in Western Religions (3) Selected figures, themes, movements, and problems. Content varies. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

430 Seminar in American Religion (3) Selected figures, themes, movements, and problems. Content varies. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

435 Seminar in Asian Religion (3) Selected figures, themes, movements, and problems. Content varies. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

440 Seminar in Comparative Religion (3) Selected figures, themes, movements, and problems. Content varies. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

446 Theoretical Issues in Medical Ethics (3) (Same as Philosophy 446.)

490 Readings and Research in Religious Studies (3) Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

499 Proseminar in Religious Studies (3) For advanced students in religious studies; required for majors. Selected specific topics: nature and function of myth in religion, problem of evil, transcendence, theories of religion, hermeneutics, integrating various disciplines involved in study of religion. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

532 Topics in the History of Religions (3) Prereq: Consent of instructor.

533 Topics in Religious Thought (3) Prereq: Consent of instructor.

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

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

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

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**Romance and Asian Languages**

(College of Arts and Sciences)

**MAJORS**

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<th>Language</th>
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John B. Rromeiser, Head

Professors:

Barrette, Paul E., Ph.D. ................. California
Brady, Patrick (Shumway Chair of Excellence), D.U.P. ............... Sorbonne
Campion, Edmund J., Ph.D. .............. Yale
Cobb, Carl W., Ph.D. ..................... Tulane
Elliott, Jacqueline C. (Emeritus), M.A. ..................... Illinois
Hand, Michael H. (Liaison), Ph.D. ........... Florida
Heflin, William H., Ph.D. ............... Florida State
Irving, Thomas B. (Emeritus), Ph.D. .... Princeton
Levy, Karen D., Ph.D. ..................... Kentucky
Maurino, Ferdinando D. (Emeritus), Ph.D. ............... Columbia
Petrovska, Maria (Emeritus), Ph.D. ....... Kentucky
Pinsky, Clara (Emeritus), Ph.D. .......... California
Rivera-Rodas, Oscar, Ph.D. .............. California
Romeiser, John B. (Liaison), Ph.D. ....... Vanderbilt
Vazquez-Bigl, A. M. (Emeritus), Ph.D. .... Minnesota
Wallace, Albert H. (Emeritus), Ph.D. ........ North Carolina
Washburn, Yulian M., Ph.D. ............. North Carolina

Associate Professors:

Briozo, Flavia, Ph.D. ...................... Washington
Cazeneuve, Odile, Ph.D. .................. Penn State
Creef, Bryant, Ph.D. ..................... California
DiMarie, Salvatore, Ph.D. ............... Wisconsin
DiPucchio, Denise M., Ph.D. ............. Kansas
Duncan, Cynthia K., Ph.D. .............. Illinois
Ehrlich, Linda, Ph.D. .................... Hawaii
Holmlund, Christine (Liaison), Ph.D. .. Wisconsin
Young, Dolly, Ph.D. ..................... Texas

Assistant Professors:

Beauvoir, Margaret, Ph.D. ............... Texas
Essif, Lea, Ph.D. ........................ Brown
Kaplan, Gregory, Ph.D. ................... Pennsylvania
LaCure, Jon, Ph.D. ........................ Indiana
Lewis, Elizabeth F., Ph.D. .............. Virginia
Nakuma, Constancio, Ph.D. .............. Sorbonne
SilvaFilho, Euridice, Ph.D. .......... North Carolina
Wilkinson, Douglas, Ph.D. .............. Yale

The Department of Romance and Asian Languages offers two advanced degrees: the Master of Arts in French and in Spanish and the Doctor of Philosophy in Modern Foreign Languages.

Enquiries should be addressed to the head of the department. The head, through the coordinators of Spanish and French, will make available further departmental requirements, regulations, and materials not listed below.

**THE MASTER'S PROGRAM**

**Thesis Option**

1. Completion of a minimum of 24 semester hours in coursework plus at least 6 hours in...
course 500 Thesis. In French, 501 is required; in Spanish, 550. A maximum of 6 hours may be taken at the 400 level, the rest at the 500 level, and under certain conditions the student may take 600-level seminars. If the student chooses to have a minor (such as Italian or Portuguese), at least 24 hours (including 6 hours of thesis) must be taken in the major, 6 in the minor.

2. A thesis, with a minimum of 6 semester hours in course 500.

3. A written examination covering the coursework and selected items from a master reading list.

4. A final oral examination covering the thesis.

Non-Thesis Option

1. Completion of at least 30 semester hours, with a maximum of 9 at the 400 level, the rest at the 500 level, including 501 (French) or 550 (Spanish). Under certain conditions, the student may take 600-level seminars. If the student chooses to have a minor (such as Italian or Portuguese), at least 24 hours must be taken in the major, 6 in the minor.

2. Three term papers that have been accepted by the student's advisory committee.

3. A written examination covering the coursework and selected items from a master reading list.

4. A final oral examination to discuss the papers (French M.A. only).

THE DOCTORAL PROGRAM

The Ph.D. in Modern Foreign Languages is offered jointly by the Department of Germanic and Slavic Languages and the Department of Romance and Asian Languages and requires advanced training in a major language and either a second language or applied linguistics. Students whose language of first concentration is German should consult the section on Germanic and Slavic Languages.

Admission Requirements

Applicants must have completed a B.A. in either French, German or Spanish to be accepted into this program. Both graduates of institutions in the United States and those with undergraduate degrees from institutions outside the United States must have a grade point average of at least 3.0. Consideration will also be given to applicants who do not have an undergraduate degree in one of the three foreign languages but do have the equivalent of an undergraduate major in one of them.

Degree Requirements

Candidates with German as a first concentration must complete a minimum of 63 semester hours of coursework beyond the bachelor's degree in addition to 24 hours of doctoral research and dissertation. Two tracks are available:

The coursework for Track I must be distributed as follows: at least 39 hours in the first concentration; at least 18 hours in the second concentration; and at least 6 hours in a cognate field.

The coursework for Track II must be distributed in this way: at least 45 hours in the first concentration; at least 12 hours in the second concentration; and at least 6 hours in a cognate field. Because Track II students will have taken 12 graduate hours instead of 18 hours in the second concentration, they will normally not be eligible to teach that field at institutions which follow SACS guidelines for college foreign language teaching.

1. First Concentration: French or Spanish. A minimum of either 39 (Track I) or 45 (Track II) hours of French or Spanish courses beyond the bachelor's degree, distributed as follows:

   400 level: A maximum of 6 hours of 400-level classes taken for the M.A. may be applied.

   500 level: A minimum of 21 (Track I) or 27 (Track II) must be taken. These must include French 512, 516, 564 or Spanish 512 and 550. Thesis hours are excluded. If 512 is used as part of a second concentration in applied linguistics, another course must be substituted in the first concentration.

   600 level: A minimum of 12 hours must be taken, exclusive of dissertation hours.

2. Second Concentration. A minimum of 18 (Track I) or 12 (Track II) hours beyond the bachelor's degree, taken in the field of applied linguistics or in a second language, either French, German, Italian, Portuguese (Track II only), Russian or Spanish. For Track I, 12 of these must be at the 500 level or above. For Track II, 3 of these must be at the 500 level or above.

   French students choosing applied linguistics must take French 421 or 429, 425, 512; and 9 (Track I) or 3 (Track II) hours of appropriate electives in English or French. Spanish students must take Spanish 421 or 429, 425, 512; and 9 (Track I) or 3 (Track II) hours of appropriate electives in English or Spanish. The student's graduate advisor must approve the electives chosen.

3. Cognate Field. Six hours in graduate courses numbered 400 and above in a field outside the department of the first concentration but related to the student's principal area of research. Students choosing applied linguistics as a second concentration are strongly urged to take their cognate work in a second language.

4. Additional requirements: For any languages taken as a first or second concentration, a student must demonstrate competence by taking a test. The test will include reading, writing, listening, and speaking, and should be completed by the time the student reaches 40 hours of study beyond the bachelor's degree. Standardized examinations that may be used for this purpose include applicable portions of either the National Testers Examination, the M.A. Examination for Teachers and Advanced Students, or the proficiency standards of the United States Foreign Service Institute (FSI).

If a student has not chosen a third language as his or her cognate area, basic competence (determined by a reading examination with translation into English administered by the department concerned) in a third language is required. If the student's first and second languages are Romance languages, the third language should be chosen from another language family. For students choosing applied linguistics as an area of second concentration, reading competence in a second language is required. Competence will be determined by translation of a text from the foreign language into English, the test to be administered by the department offering the language.

A comprehensive examination on the language and literature of the first and second concentrations must be passed before the student may be admitted to candidacy. The candidate is required to defend his/her dissertation in an oral examination. Central emphasis is put on the doctoral dissertation as a final test of the candidate's scholarly qualifications.

Graduate Teaching Assistants with a second concentration in another language should have the opportunity and will be strongly encouraged to instruct in the languages of both their first and second concentration, subject to staffing needs. Doctoral students are strongly encouraged to reside and study abroad and will be assisted in identifying potential sources of financial support (e.g., Fulbright, McCutie, Rotary fellowships).

For additional courses, see Germanic and Slavic Languages.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The Ph.D. program in Modern Foreign Languages is available to residents of the state of Alabama. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

Asian Languages

GRADUATE COURSES

431 Readings in Chinese Literature (3) Prereq: Mastery of intermediate-level Chinese or consent of instructor. May be repeated. Maximum 9 hrs.

441 Readings in Japanese Literature (3) Prereq: Mastery of intermediate-level Japanese or consent of instructor. May be repeated. Maximum 9 hrs.

471 Selected Topics in Asian Studies (3) Content varies. May be repeated. Maximum 9 hrs.

French

GRADUATE COURSES


411 French Literature of the 16th Century (3) Highlights of 16th-century French literature. Excerpts from Rabelais and Montaigne; readings of prose from written by writers from Lyon and members of Pèdède. Prereq: 300-level literature course.


413 French Literature of the 18th Century (3) Major works of Enlightenment. Prereq: 300-level literature course.


416 Survey of Francophone Literature (3) Examination of French literature outside metropolitan France, particularly Africa and Caribbean. Prereq: 300-level literature course.

420 French Cinema (3) French cinema from earliest days through New Wave directors. Prereq: 300-level literature course. May apply toward major.

421 Phonetics (3) Foundation in science of phonetics. Practical exercises and individual performance. Laboratory training highly recommended. Graduate credit not
allowed for departmental majors. Prereq: Intermediate Compositions and equivalent.

422 Advanced Grammar (3) Improving one’s written French by studying basic and more refined structures of French language. Writing creative free-style compositions. Prereq: Intermediate Composition and Conversation or French for Business. 2 hrs weekly.

423-24 Advanced Conversation (1,1) Informal conversation with native speaker on contemporary topics. Stresses in-class contact rather than outside preparation. Prereq: Intermediate Composition and Conversation or French for Business. 2 hrs weekly.

425 Introduction to Descriptive Linguistics (3) Theory and practice of techniques of linguistic analysis in subfields of phonetics, phonology, morphology, syntax, semantics, pragmatics and historical linguistics; discussion of relevance of teaching and teaching foreign languages and to study of literary texts. Recommended prereq: Language, Linguistics and Society. (Same as German 425, Linguistics 425, Russian 425, and Spanish 425.)

426 Methods of Historical Linguistics (3) (Same as German 426, Russian 426, Spanish 426 and Linguistics 426.)

429 Romance Linguistics (3) Development of Classical Latin through Vulgar Latin into major Romance languages. (Same as French 429 and Linguistics 429.)

430 Theatrical French (2-3) Performance in one or more French plays. Prereq: 300-level literature course. May apply toward major.

431 Highlights of French Civilization (3) Survey of French civilization from the Gauls to World War II. Historical events, daily life, art forms of art. Prereq: 300-level literature course.

432 Contemporary French Culture (3) French contemporary civilization and culture since World War II. Problems, trends, and organization of French society today. Prereq: 300-level literature course.

434 Literature of Quebec (3) Survey of literature of Quebec as well as literature connected with North America. Readings include explorers and missionaries, such as Voyages of Champlain and Journals of Jesuits, and literature of contemporary Quebec. Prereq: 300-level literature course.

445 Advanced French for Business (3) Advanced contemporary French language and culture as relates to business transactions. Comparative approach to explore differences and similarities between francophone business culture(s) and those of North America and Japan. Building knowledge of business terminology while being sensitized to cultural aspects and dangers of simplistic stereotyping. Prereq: French for Business or consent of instructor.

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

501 Techniques in Literary Analysis (3) Required for M.A. program. Intensive course in explication de texte, a close stylistic analysis of texts representative of different eras and of different genres.

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

512 Teaching a Foreign Language (3) Practical application of methods for teaching and evaluating basic language skills and foreign language skills, and cultural aspects through seminars, demonstrations, peer teaching, and observation of foreign language classes. Required of all M.A. and Ph.D. students holding Graduate Teaching Assistantships, except those whose previous training or experience warrant their being excused by department.

516 Bibliography and Methods of Research (2) Critical research tools and scholarly contributions in French literature and language. Practical exercises on compiling of scholarly data using computer-based and non-computer sources.


531 French Literature of the 16th Century (3) Literature of first half of 16th century. Rabelais and other prose writers, humanists, and poetry of Marot, Lyonnais group, and young Pléiade poets.

532 French Literature of the 16th Century II (3) Literature of second half of 16th century, mature works of Pléiade writers and such poets as Ronsard and Sponde; Montaigne; writers of scientific works and moralists; drama.

534 French Literature of the 17th Century (3) French prose and poems works of 17th century.

542 French Literature of the 17th Century II (3) Classical French theatre of 17th century.

543-52 French Literature of the 18th Century (3,3) Reading and interpreting works of Voltaire, Diderot, Rousseau, Beaumarchais, and others.

546 Lyric Poetry of the 19th Century (3) Reading and interpreting great French romantic poets, "tari pour tari" movement, Parnassians, Charles Baudelaire and symbolists.

548-62 French Literature of the 19th Century (3) Reading and interpreting works of Hugo, Vicq, Stendhal, Balzac, Baudelaire, Flaubert, Zola, Verlaine, and others. Reading and interpreting works of pre-Romantic and post-Romantic and post-Realist stylists.

571-72 Trends in Modern French Literature (3) In depth study of some of most revolutionary, challenging poets, novelists, dramatists of 20th century.

581-82 The French Novel (3,3) French Novel from 17th through 20th centuries.

583 Problems in Stylistics (3) Survey of comparative English-French stylistics. Development and improvement of one's written French.

584 Modern Theory and Criticism (3) Survey of twentieth century critical theory, including psychoanalysis, Marxism, spiritualism and more.

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

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

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

Portuguese

GRADUATE COURSES

431-32 Topics in the Literature & Language of Portuguese and World (3,3) Outstanding works of literature and culture from Portuguese countries. Topics may vary. Prereq: At least one course at the 300 level or the equivalent. May be repeated. Maximum 12 hrs.

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

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

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

Spanish

GRADUATE COURSES

421 Phonetics (3) Prereq: Intermediate Conversation and Composition or consent of instructor.

422 Advanced Grammar (3) Finer points of grammatical structures. Required of all majors. Available to non-native speakers only. Prereq: Intermediate Conversation and Composition or consent of instructor.

423 Advanced Conversation (3) Develops speaking skills to advanced level through wide range of activities available to non-native speakers only. Prereq: Intermediate Conversation and Composition, or Spanish for Business or consent of instructor.

424 Advanced Composition (3) Develops writing skills to advanced level through wide range of compositions on assigned topics. Available to non-native speakers only. Prereq: 422 or consent of instructor.

425 Introduction to Descriptive Linguistics (3) (Same as French 425, German 425, Russian 425, and Linguistics 425.)

426 Methods of Historical Linguistics (3) (Same as German 426, French 426, Russian 426, and Linguistics 426.)

429 Romance Linguistics (3) (Same as French 429 and Linguistics 429.)

431 Spanish Civilization (3) Major social, political, and cultural achievements of Spanish people from origins of their civilization until today. Prereq: Aspects of Spanish and Spanish American Literature or equivalent.

436-37 Survey of Spanish Literature (3,3) 435-435—Spanish literature through Golden Age. 436—Spanish literature since 1700. Prereq: Aspects of Spanish and Spanish American Literature or equivalent.

450 Hispanic Drama (3) Close reading and analysis of representative works by selected dramatists of each period, either Spanish or Spanish American. Topics vary. Prereq: Aspects of Spanish and Spanish American Literature or consent of instructor. May be repeated with consent of department. Maximum 6 hrs.
451 Hispanic Prose (3) Close reading and analysis of representative works by selected novelists, essays, and short-story writers of Spain or Spanish America. Topics vary. Pre-req: Aspects of Spanish and Spanish American Literature or equivalent. May be repeated with consent of department. Maximum 6 hrs.

452 Hispanic Poetry (3) Major poets of each period, either Spanish or Spanish-American. Topics vary. Pre-req: Aspects of Spanish and Spanish-American Literature or equivalent. May be repeated with consent of department. Maximum 6 hrs.

459 Capstone Colloquium in Spanish (3) Integrative experience. Broad range of issues and topics that affect much of Spanish-speaking world and also involve those who specialize in Hispanic studies. Pre-req: Aspects of Spanish and Spanish American Literature or equivalent. Maximum 6 hrs.

461 Special Topics (3) Aspect of Hispanic literature, culture, linguistics, or foreign language pedagogy. Topics vary. May be repeated with consent of department. Maximum 6 hrs.

471 Latin American Civilization (3) Latin America's diverse heritage and major social and political institutions. Pre-req: Aspects of Spanish and Spanish American Literature or equivalent.

473-74 Survey of Spanish American Literature (3,3) 473-Historical survey from Conquest to late 19th century. 474-Major literary movements, writers and works of 20th century. Pre-req: Aspects of Spanish and Spanish American Literature or equivalent.

479 Social Protest Literature of Latin American (3) Analysis of literature as means of unmasking social ills that have traditionally beset Latin America. Indigenismo, Black literature, women writers, role of writer in Latin American society. Pre-req: Aspects of Spanish and Spanish American Literature or equivalent.

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

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

512 Teaching a Foreign Language (3) Practical application of methods for teaching and evaluating basic language skills and cultural aspects through seminars, demonstrations, peer teaching, and observation of foreign language classes. Required of all M.A. and Ph.D. students holding Graduate Teaching Assistantships, except those whose previous training or experience warrants their being excused by department.

522 Advanced Communication Skills for Teachers and Other Professionals (3) Ascertainment of oral and written proficiency in Spanish through extensive use of authentic contemporary materials, class lecture and discussions; oral and written presentations and reports. Especially recommended for graduate students, teachers, and other professionals seeking to maintain or enhance high level communicative competency.

531 Old Spanish (3) Old Spanish language and medieval Spanish literature through 13th century.

532 Medieval Spanish Literature (3) Spanish literature of 14th and 15th centuries.

533 Golden Age Prose (3) Wide range of prose fiction in Spain during 16th and 17th centuries: Moresque, picaresque, sentinel, pastoral and exemplary novels, and dialogues.

534 Don Quixote (3)

535 Golden Age Poetry (3) Garcilaso, Fray Luis de León, San Juan de la Cruz, Lope de Vega, Quevedo, and Góngora.

537 Golden Age Drama (3) Major dramatists of period: Lope de Vega, Tirso de Molina, Ruiz de Alarcón, Guillén de Castro, Calderón de la Barca, Moreto, and Rojas Zorrilla.


543 The 20th-Century Spanish Novel (3) Baroja, Azorín, Valles-íñigo, Pérez de Ayala, Cela, Delibes, Goytisolo, Matute, and at least one present-day novelist.

545 Modern Spanish Poetry (3) From Bécquer, Unamuno, A. Machado, Jiménez, Lorca, Guillel, Alexandre, and a contemporary, Celada.

547 Modern Spanish Drama (3) Major playwrights of 20th-century Spain.

550 Techniques of Literary Analysis and Research Methods (3) Theoretical and critical essays on various techniques of literary analysis. Exploration of bibliographic and research materials.

551 Special Topics in Spanish or Spanish American Literature (3) May be repeated. Maximum 6 hrs.

562 Directed Readings (3)

561 Spanish American Colonial Literature (3) From pre-Colombian era through 18th century. Reading and analysis of selected works from Colonial Spanish American period and their Contingent sources. Indigenous texts and authors.

562 Nineteenth-Century Spanish American Literature (3) From early nineteenth century to 1880. Content varies with regard to genre, theme, literary movements, or other aspects contributing toward definition of Spanish American literature.


573 The Spanish American Novel: Chile and the River Plate Nations (3) Novels from Chile, Argentina, Uruguay and Paraguay. Modern world.

575 Spanish American Modernismo (3) Various facets of Spanish American Modernismo in poetry and prose, 1890-1930.

576 Contemporary Spanish American Poetry (3) Major poets in Spanish American from post-modernismo to present day.

577 Spanish American Drama (3) Major playwrights of 20th-century Spanish America.


579 The Spanish-American Short Story (3) Short story by major writers in Spanish America from Realism to present day, theory and criticism of genre.

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

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

593 Independent Study (1-15) See College of Arts and Sciences. Letter grade or S/N.

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

621 Seminar in Spanish American Literature (3,3) Topics vary in field of Peninsular literature. May be repeated with consent of department. Maximum 9 hrs.

631-32 Seminar in Spanish American Literature (3,3) Topics vary. May be repeated with consent of department. Maximum 9 hrs.

Russian
See Germanic and Slavic Languages

Small Animal Clinical Sciences
See College of Veterinary Medicine and Comparative and Experimental Medicine

Social Work
(Majors in Social Work)

MAJOR DEGREES

Social Work ................................... M.S.S.W., Ph.D.
Eunice Shatz, Dean

Professors:
Bicho, M. H. (Emeritus), M.S. .......... Ohio State
Cetingok, M., Ph.D. ........ Washington (St. Louis)
Faver, C. Ph.D. .............................. Michigan
Fryer, Gideon W. (Emeritus), Ed.D. .. Columbia
Glisson, C. A., Ph.D. .............. Washington (St. Louis)
Granger, Ben P. (Emeritus), Ph.D. .... Brandeis
Hirayama, H., D.S.W. ............ Pennsylvania
Mclaran, G. (Emeritus), M.S.S.W.
Mullins, M. Kate (Emeritus), Ph.D. ... Chicago
Noce, Roger M., D.S.W. .......... Tulane
Orten, J. (Emeritus), D.S.W. ........... Alabama
Rybenstein, H., Ph.D. .............. Chicago
Shatz, Eunice, Ph.D. ............ Brandeis

Associate Professors:
Bell, W. J., D.S.W. ............. Tulane
Combs-Orme, Terri, Ph.D. ....... Washington (St. Louis)
Cruthirds, C. Thomas, D.S.W. ....... Tulane
Denn, Judith, Ph.D. .............. Tennessee
Jennings, J., Ph.D. .............. Michigan
Nugent, W., Ph.D. .............. Florida State
Orme, J. P., Ph.D. ............... Washington (St. Louis)
Spiluzza, Frank, M.S.S.W. ...... Tennessee
Thompson, J., Ph.D. .............. Rutgers
Vaughn, H. H., Ed.D. ............ Memphis State

Assistant Professors:
Alep, Ruth L., Ph.D. .......... Washington (St. Louis)
Campbell, P. M., D.S.W. ......... Alabama
Collier, J. C., M.S.W. .......... Tulane
Crawford, S., M.S.W. ......... Texas
Davey, Timothy L., Ph.D. ......... Florida State
Denby, Ramona, Ph.D. ............ Ohio State
Egan, Marcia, Ph.D. .......... Maryland
Jones, J., Ph.D. ................. Bryn Mawr
Marley, Martha, D.S.W. ......... Tulane
Page, Timothy F., M.S.W. .......... Tulane
Patterson, D., Ph.D. ............. Utah
Rocha, Cynthia, Ph.D. .......... Washington (St. Louis)
Rogge, Mary, M.S.S.W. .......... Washington (St. Louis)
Spaulding, E., Ph.D. ......... Smith
Vickerstaff, Susan, Ph.D. ........ Alabama

Field Practice Coordinators:
Betz, Phyllis (Knoxville), M.S.S.W. .... Tennessee
Bett, Phyllis (Knoxville), M.S.S.W. .... Tennessee
Bett, Phyllis (Knoxville), M.S.S.W. .... Tennessee
Bett, Phyllis (Knoxville), M.S.S.W. .... Tennessee

THE MASTER'S PROGRAM

The Master of Science in Social Work program prepares social workers to provide professional leadership in: 1) clinical social work practice and 2) social work management and community practice. These objectives are met through a curriculum requiring of all students a professional foundation and a concentration in either clinical social work practice or management and community practice.
Admission Requirements

Admission to the master’s program is based on the following requirements:

1. A Bachelor’s degree from an accredited college or university with appropriate preparation in the social sciences. At least three-fourths of the applicant’s undergraduate work should be in the social sciences, humanities, physical sciences, and other Arts and Sciences subjects. Applicants must have at least one course in each of the following: economics, government or political science, human biology, sociology or anthropology, psychology, philosophy or the arts, or literature, or history. Applicants with other academic backgrounds may request consultation to discuss ways that they can meet the requirements.

2. A grade point of 2.7 or higher on a 4.0 scale. Applicants falling below this average may be considered for probationary admission on the basis of supplemental evidence of the ability to perform at a satisfactory level. The University requires a minimum GPA of 2.7 for admission to the Graduate School.

3. Personal qualifications acceptable for entrance into the professional practice of social work.

4. All applicants must submit up-to-date scores from the Graduate Record Examination (general).

Preference is given to applicants with a GPA of 3.0 or above in their undergraduate work with substantial preparation in the social sciences.

Advanced Standing

The University of Tennessee College of Social Work has an advanced standing program. Admission to advanced standing requires: (1) a B.S.W. from an accredited program, (2) an overall undergraduate GPA of 3.0 or greater, and (3) personal qualifications acceptable for entrance into the professional practice of social work. Students admitted into advanced standing are required to complete a minimum of 42 hours of study in either of the college’s concentrations - clinical social work practice or management and community practice. These students will follow the curriculum plan and meet all requirements of the concentration during three semesters of study in the program.

Specific information about the advanced standing program is available from the college. Application for admission to the advanced standing program is through the regular admission process.

Extended Study

Planned part-time programs are available in all three branches of the college. Admission requirements are the same as for full-time study. Coursework can be completed over a three-year period. One year of the student’s period of study must be on a full-time basis.

Financial Aid

Students may apply directly to the University’s Financial Aid Office for assistance such as the National Direct Student Loan or the Work-Study Program. Other stipends are administered by the College and awarded on the basis of need. Applications for these funds must be made to the Branch of the College the student will attend. A student must first apply for University assistance, since College funds are considered supplementary to those of the University. Additional information about College stipends may be obtained from the College of Social Work.

Transfer Credits

Transfer credits will be accepted toward degree requirements. Applicants must meet the admission requirements of The Graduate School and the College of Social Work. Transfer courses must be approved as equivalent to required and/or elective courses taken for graduate credit and passed with a grade of B or better. An S (earned on an S/N/C system) for the field practicum is also accepted. In addition, transfer courses must be part of an otherwise satisfactory graduate program (B average) and be approved by the dean. This coursework must be completed within the six-year period prior to the receipt of the degree.

Field Practice

Field instruction is a critical component of the student’s first- and second-year programs. Through cooperation with a wide range of social agencies and human service programs throughout Tennessee, the college is able to provide field placements in a variety of social work practice areas. The faculty works closely with the placement agencies and the field instructors to ensure that students have quality field experience, meeting the objectives of the core curriculum and the concentration.

The college uses a concurrent class and field plan. Students are in field two days per week during the first year and three days per week in the second year.

First-year agency placements are selected to provide practice experiences related to the foundation curriculum content. Within the placement, each student’s experiences are planned and designed according to educational objectives.

Second-year placements are selected according to the student’s area of concentration, individual career interests, and educational needs. The student actively participates with the field practice coordinator and the educational committee in selection of the second-year placement. The second-year field placement experience focuses on the integration of social work knowledge and values, and emphasizes the acquisition and development of practice skills.

Students are responsible for meeting the requirements of their placement agencies in terms of office hours and workload coverage. This responsibility takes precedence over scheduled University breaks and may result in variations in holidays and office hours for the student.

Field Practice Coordinators

The second-year field placements are coordinated by the field practice coordinator and the educational committee. Each student’s experiences are planned and designed according to the student’s area of concentration, individual career interests, and educational needs. The student actively participates in selecting the second-year field placement.

Field instruction is a critical component of the student’s first- and second-year programs. Through cooperation with a wide range of social agencies and human service programs throughout Tennessee, the college is able to provide field placements in a variety of social work practice areas. The faculty works closely with the placement agencies and the field instructors to ensure that students have quality field experience, meeting the objectives of the core curriculum and the concentration.

The college uses a concurrent class and field plan. Students are in field two days per week during the first year and three days per week in the second year.

First-year agency placements are selected to provide practice experiences related to the foundation curriculum content. Within the placement, each student’s experiences are planned and designed according to educational objectives.

Second-year placements are selected according to the student’s area of concentration, individual career interests, and educational needs. The student actively participates with the field practice coordinator and the educational committee in selection of the second-year placement. The second-year field placement experience focuses on the integration of social work knowledge and values, and emphasizes the acquisition and development of practice skills.

Students are responsible for meeting the requirements of their placement agencies in terms of office hours and workload coverage. This responsibility takes precedence over scheduled University breaks and may result in variations in holidays and office hours for the student.

Transfer Credits

Coursework equivalent to the first year of the master’s program, completed in another accredited graduate social work program, is usually accepted toward degree requirements. Applicants must meet the admission requirements of The Graduate School and the College of Social Work. Transfer courses must be approved as equivalent to required and/or elective courses taken for graduate credit and passed with a grade of B or better. An S (earned on an S/N/C system) for the field practicum is also accepted. In addition, transfer courses must be part of an otherwise satisfactory graduate program (B average) and be approved by the dean. This coursework must be completed within the six-year period prior to the receipt of the degree.

A maximum of 6 semester credits from work earned in disciplines other than social work may be transferred as elective credits. The student’s academic committee must approve the request and the transfer credit must meet Graduate School requirements.

Proficiency Examination

Students in the master’s program may earn a maximum of nine hours by proficiency examination, with the exception of field practice courses. Students interested in proficiency examinations are referred to The Graduate School statement describing the procedure for applying for examination.
THE DOCTORAL PROGRAM

The College of Social Work offers the Doctor of Philosophy with a major in Social Work.

The focus of social work education at the doctoral level is to foster the development of an attitude of scientific inquiry, knowledge of the specific method, ability to extend the knowledge base of social work practice, and effective participation in leadership roles in social work education, research, and practice. The emphasis of the doctoral program is upon:

The analysis of direct intervention and social administration and of the interrelationships among each of them and their social policy, organizational, and community contexts.

Research-based knowledge to inform and guide social work practice, social policy, and social welfare program development.

The program consists of foundation courses, elective courses, and dissertation research. The courses are available only in Knoxville. Students and their committees can develop a plan for completing their research in Nashville and Memphis based on the availability of dissertation resources.

Students have the opportunity to work in the Children's Mental Health Services Research Center, a National Institute of Mental Health research center, as part of their training. The Center is one of only three such centers nationwide and focuses on services to children who have experienced mental health problems associated with abuse, neglect, violence and a variety of psychosocial problems.

Admission Requirements

The Ph.D. program is designed for students who have completed a master's degree in an accredited school of social work and have post-master's social work/social welfare experience. Applicants who do not meet these requirements, but believe they have equivalent credentials should contact the Chair of the Ph.D. program for further information regarding admissions criteria.

General Requirements

1. A minimum of 63 hours beyond the master's degree completion of 24 hours of required coursework, b) completion of 15 credits of advanced electives, at least 12 of which are taken outside the department, and c) completion of at least 24 credit hours of dissertation research.
2. Successful completion of qualifying and comprehensive examinations.
3. Completion and defense of the dissertation.

Curriculum

The curriculum of the Ph.D. program consists of foundation course work, electives, and dissertation research. The foundation curriculum consists of 21 hours of coursework in the history and philosophy of social work, issues in direct service and administration, and the development of research methodology and statistics. Upon this foundation students and their academic committees develop a plan of study consisting of coursework in Social Work and other departments of the University.

Typically, the foundation curriculum is completed and elective coursework begins during the first year of study, the elective requirement is completed and dissertation research begun in the second year of study, and dissertation research is continued in the third year of study. While it is generally expected that the coursework will be completed on a full-time basis, dissertation research can be completed on a planned part-time basis.

Specific courses required are 601, 602, 612, 613, 840, and Statistics 531 and 532 or any two grade level statistics courses approved by the Doctoral Program Chair.

Examinations

All doctoral students are required to pass a qualifying examination and comprehensive examination. The qualifying examination covers the foundation curriculum. The comprehensive examination is administered by members of the doctoral committee and is designed for the student to demonstrate comprehensive knowledge of the major and cognate areas and the dissertation topic. In case of failure of either examination, the student may request a retake. The result of the second examination is final.

Research Finances

Financial aid is available to qualified students in the form of fellowships, scholarships, and teaching and research assistantships. Graduate assistantships and other forms of assistance are awarded on the basis of merit and interest to applicants who are accepted into the Ph.D. program.

ACADEMIC COMMON MARKET

An agreement among southern states for sharing graduate programs allows legal residents of some states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The M.S.S.W. and Ph.D. programs in Social Work are available to residents of the state of Arkansas, the Ph.D. residents of Kentucky, Oklahoma, or West Virginia. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

GRADUATE COURSES

NOTE: Graduate students majoring in fields other than Social Work are admitted to certain Social Work courses with the approval of the College of Social Work and the student's major professor.

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

501 Foundations of Social Work Practice I (3) Survey of history, mission, and identity of profession. Basic theories, values, and methods generic to social work practice at various systems levels. Assessment, planning, communication, intervention, and evaluation skills. Prereq: Admission to College or consent of Instructor. F

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

503 Foundations of Social Work Practice II (3) Generalist practice with individual, family, and small group systems. Ecological theory to frame understanding of such systems and their adaptation to environments. Various social work roles and intervention strategies pertaining to each client system. Prereq: 501 or consent of Instructor. Sp

504 Foundations of Social Work Practice III (3) Basic theory, methods, problems, and strategies in implementing planned change within and among larger social systems: task groups, human service organizations, and community systems. Various practice roles: planner, program developer, supervisor, administrator, advocate and task group leader. Prereq: Completion of first semester of foundation or consent of Instructor. Sp

506 Social Work Research (3) Research methodologies with respect to evolution and application to social work theory and practice. History and philosophies of science; problem formulation; research design; ethics; instrument use and construction; data collection; analysis and reporting; and evaluation and utilization of research. Prereq: Admission to college or consent of instructor. Sp

508 Practicum in Social Work Research (3-6) Supervised practice in application of research methods to social work. Prereq: 506 or consent of faculty conducting investigation. May be repeated. Maximum 6 hrs. S/NC only. E

509 Graduate Seminar in Public Health (1) (Same as Public Health 508, Exercise Science 506, Nutrition 509, and Nursing 509.)

514 Human Behavior in the Social Environment I (3) Theories pertaining to individual, family, and group development while emphasizing relationships among biological, social psychological, and cultural systems. Dynamics of behavior in contexts of social structures, including ethnicity, social class, gender roles. Prereq: Admission to College or consent of Instructor.

515 Human Behavior and Social Environment II (3) Patterns of adaptive and maladaptive behavior, recognition of intervention criteria, intervention models. Interactions among individuals, families, organizations, communities in maladaptive behavior: mental illness and abusive behavior. Prereq: 514 or consent of Instructor.

516 Social Welfare Policy and Services (3) Development of contemporary social policy at local, state, national, and international levels. Contribution of social work professionals to formal policy-making processes through which macro-level social change is affected and how grandparents care for grandchildren is affected. Prereq: Social Work Practice I or consent of Instructor. F

518 Social Work and Oppression (3) Sources, dynamics, and impact of oppression in U.S. society as manifested in both social/interpersonal systems and personal experience. Connections among various forms of oppression: race, sexism, classism, and heterosexism. Prereq: Consent of instructor. F

521 Clinical Social Work Practice with Individuals (3) Theories, knowledge, and skills for clinical practice with individuals from ecological perspective. Therapeutic process and treatment strategies, incorporating content from psychodynamic and cognitive practice models. Specific client problems. Prereq: Completion of foundation or consent of Instructor.

523 Clinical Social Work Practice with Families (3) Concepts related to understanding and analyzing family dynamics and interactional patterns from perspective of major family therapy models. Techniques of treatment in terms of application to families with varied system and individual problems and to families from varied social and cultural backgrounds. Prereq: Completion of foundation or consent of instructor. F

525 Clinical Social Work Practice with Groups (3) Theoretical and historical approaches to social work with groups and clinical principles supporting specific types of group work used in clinical practice and associated leader interventions. Prereq: Completion of foundation or consent of Instructor. Sp

526 Research for Assessment of Social Work Treatment (3) History and philosophies, conceptual ap-
530 Seminar in Clinical Social Work (3) Topics in theory and practice of clinical social work with individuals, couples, families and groups. Prereq: Completion of foundation or consent of instructor.

532 Short-Term Treatment (3) Theory and practice of planned short-term treatment programs, emergency treatment, and crisis intervention. Prereq: Foundation or consent of instructor.

533 Social Work Treatment with Couples (3) Theories regarding contemporary marriage styles, problem areas in relationships, and application of treatment methods and skills for problem resolution. Prereq: Foundation or consent of instructor.

534 Social Work Treatment with Children and Adolescents (3) Examination of various treatment modalities for assessing and treating children and adolescents. Prereq: Foundation or consent of instructor.

535 School Social Work (3) Place of school as community institution and resource. Methods, processes, and techniques employed in school social work. Prereq: Foundation or consent of instructor.

541 Leadership and Management in Human Services (3) Management practices and leadership skills required in development and management of human services delivery systems. Issues regarding human resource management, resource allocation, strategic planning, and organizational dynamics. Prereq: Completion of foundation or consent of instructor.

543 Fiscal Management and Resource Development (3) Administrative decision-making related to financial planning and resource allocation in human service organizations. Knowledge and skills in budgeting, allocating, expenditure control, fundraising, grant writing, marketing, and evaluation. Prereq: Foundation or consent of instructor.

547 Evaluation Research (3) History and philosophies, conceptual approaches, techniques and methods, and issues in practice and utilization of evaluation research as applied to development and evaluation of social work programs and policies. Issues pertaining to strengths and limitations of various evaluation methods, microcomputer application of data, and measurement of program goals and objectives. Prereq: Completion of foundation or consent of instructor.

550 Seminar in Management and Community Practice (2-3) Topics in theory and practice of management and community practice. Prereq: Foundation or consent of instructor. May be repeated. Maximum 6 hrs.


552 Community Organization (3) Locality development, social planning and social action as practice models for development of resources to meet human needs. Prereq: Foundation or consent of instructor.

561 Supervision and Consultation in Social Work (3) Roles, techniques, and practices of social work supervision and consultation. Prereq: Foundation or consent of instructor.

562 Social Work and Black Families (3) Historical and contemporary theories about black family systems. Development of family roles and roles of black families within service delivery systems. Prereq: Foundation or consent of instructor.

563 Social Aspects of Illness (3) Social, economic, and emotional problems arising from or related to illness and disability and their implications for social work. Prereq: Foundation or consent of instructor.

564 Substance Abuse (3) Survey and analysis of socio-cultural, medical and psychological factors underlying alcoholism and drug abuse and addiction; recent research and treatment innovations. Prereq: Foundation or consent of instructor.

566 Social Gerontology (3) Physical, psychological and social aspects of aging. Major social policies and programs. Prereq: Foundation or consent of instructor.

580 Field Practice (3) Instruction and supervision in social work practice. Prereq or coreq: 501. S/N/C only.

581 Field Practice (3) Instruction and supervision in social work practice. Prereq or coreq: 580. S/N/C only.

582 Field Practice (6) Instruction and supervision in clinical social work practice or management and community practice. Prereq: Completion of foundation. S/N/C only.

583 Field Practice (6) Instruction and supervision in clinical social work practice or management and community practice. Prereq: 582. S/N/C only.

584 Field Practice (2-6) Instruction and supervision in social work agencies. Prereq or coreq: 512. May be repeated. S/N/C only.


593 Independent Study (1-6) Individualized study, student selects, designs, and completes examination of special issue or problem. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs. F, Sp.

600 Doctoral Research and Dissertation (3-15) Pr/N only.

601 Research for Social Work Practice (3) Epistemological and methodological considerations for both quantitative and qualitative research for social work practice. F

602 Research for Social Work Practice II (3) Epistemological and methodological considerations for both quantitative and qualitative research for social work practice. Sp

604 Research in Social Service Settings (3) Advanced research under faculty supervision of practice issues in community agencies. Prereq: First year required. Ph.D. courses or consent of instructor. May be repeated. Maximum 9 hrs. F, Sp.

608 Evaluative Research for Social Work Practice, Programs and Policy (3) Techniques and strategies for quantitative and qualitative analysis of social policy's impact on individuals and groups and for evaluating processes and outcomes of social work practice.


613 Social Work Practice and Its Social Context II (3) Critical analysis of knowledge bases of major practice modalities in administration and planning. Sp

640 History of American Social Work (3) Social, cultural, economic and political contexts for development of social work profession, development of education for profession, and modern welfare system.

650 Programs and Legislation for Children and Families (3) Background, purposes, and current issues surrounding major social welfare and health programs serving disadvantaged children and their families: Social Security Act (Title IV, Child Welfare and AFDC; Title V, the Maternal and Child Health Block Grant; Title XIX, Medicaid); Head Start, WIC and other nutrition programs, and Healthy Start. Current issues and controversial legal changes.


693 Directed Study in Social Work Research (3) Advanced individual study, under faculty guidance, of research, under faculty supervision, of practice issues in community agencies. Prereq: First year required. Ph.D. courses or consent of instructor. May be repeated. Maximum 9 hrs. F, Sp.


Sociology 169

Sociology (College of Arts and Sciences)

MAJOR

DEGREES

Sociology ................................................. M.A., Ph.D.

Michael L. Benson, Head

Professors:

Betz, D. Michael, Ph.D. ................................ Michigan State
Blalock, James A., Ph.D. .............................. Iowa
Gaventa, John P., Ph.D. ................................. Oxford
Hastings, Donald W., Ph.D. ......................... Massachusetts
Hood, Thomas C., Ph.D. ............................... Duke
Ploch, Donald R., Ph.D. ............................... North Carolina
Shovner, Neal, Ph.D. ................................. Illinois
Wallace, Samuel E., Ph.D. ............................ Minnesota

Associate Professors:

Benson, Michael L., Ph.D. ........................... Illinois
Cable, Sherry, Ph.D. ................................. Penn State
Kurtz, Suzanne B., Ph.D. ............................. Illinois (Chicago)
Perrin, Robert G. (Liaison), Ph.D. ................... British Columbia

Assistant Professor:

Jalal, Asafa, Ph.D. ................................. SUNY (Binghamton)
Jones, Robert E., Ph.D. ............................... Washington State

The Sociology Department offers graduate study leading to the Master of Arts and the Doctor of Philosophy. The M.A. program includes a thesis and non-thesis option. The graduate program has concentrations in criminology; energy, environment, and resource policy; and political economy. The criminology concentration includes 505, 551, 653, and 655. The energy, environment, and resource policy concentration includes 560, 563, 661, 662, and 665. The political economy concentration includes 504, 540, 541, 643, 644, and 645. Both the master's and the doctoral program allow for the construction of individualized programs of study. Detailed information may be obtained from the Director of Graduate Studies in Sociology. All incoming students will be advised by the Director of Graduate Studies. New students are admitted in fall semester only and applications must be received by the Graduate Admissions and Records Office by February 1.

ADMISSION REQUIREMENTS

1. Acceptable scores on the general Graduate Record Examination (verbal, quantitative, and analytical) are required. GRE scores in the subject area (Sociology) are requested but not required.

2. Three letters of recommendation (forms may be obtained from the department).

3. Completion of the appropriate previous degree (baccalaureate, preferably with a major in one of the social sciences, for the M.A. program; master's degree in one of the social sciences for the doctoral program).

THE MASTER'S PROGRAM

Thesis Option

A minimum of 30 hours beyond the baccalaureate degree, including 24 hours of coursework and 6 hours of Thesis 500, is required. Students must complete Sociology 521, 531, Statistics 531, and one foundation
course (504, 505, or 560). At or near the end of all coursework, the student must take an oral examination on course material and thesis. The examination will be administered by the student’s committee.

Non-Thesis Option
A minimum of 30 hours of coursework is required, including Sociology 521, 531, Statistics 531, and one of the following: 504, 505, or 560. Sociology 534, 622, and Statistics 532 are recommended. Sociology courses at the 400 level may be taken with the approval of the student’s committee. A student’s plan of study should follow one of the following approaches: Plan 1, 6 hours in one of the department’s concentrations and 6 hours in a second area, including areas outside the department, subject to the approval of the student’s committee; Plan 2, 12 hours in a special area of study approved by the student’s committee and the department’s Graduate Program Committee. Students are encouraged to prepare a paper synthesizing their knowledge of the concentration(s). Students who incorporate supervised field experience in their programs are encouraged to prepare a report based on those experiences that demonstrates their understanding of research, theory, and report writing. All students must take final written and oral examinations that include questions on their general coursework in theory and methods and on their special areas of study.

Subject to approval by the student’s committee, up to 12 hours may be taken in courses outside the department for either program.

THE DOCTORAL PROGRAM

Coursework
Twenty-four hours of coursework beyond the master’s degree are required (exclusive of S/NC credits). Twelve hours of course credit in Sociology at the 600 level are required. Students who enter the program without the courses required for the M.A. degree (521, 531, Statistics 531) or their equivalents must take them as remedial work which does not apply to their requirements must complete Sociology 522, 523, 531, 532, or 563; and Statistics 532 or another advanced course in statistics. Completion of 9 hours in each of two concentrations is encouraged. A student who cannot achieve his/her educational goals within the department’s concentrations may construct an individual course of study subject to the approval of the student’s doctoral committee and the Graduate Program Committee. Sociology courses at the 400 level may not be taken without the consent of the student’s advisor and the Graduate Program Committee. Six hours may be taken in related fields without petitioning the Graduate Program Committee for approval. The student’s program may include a minor or cognate field.

Comprehensive Examinations
Written examinations in four areas are required (sociological theory, research methodology, and two substantive areas). Doctoral students are eligible to take the theory and methodology examinations whenever offered. Substantive examinations may be taken upon completion of theory and methodology examinations. Detailed information on examinations and examination options (generalist, specialist, and colateralist) may be obtained from the department.

Dissertation and Final Examination
A dissertation based on original research must be completed (24 hours). The candidate must pass an oral defense of the dissertation, including the theory and methodology related to the research, in accordance with the deadlines specified by The Graduate School.

MINOR IN ENVIRONMENTAL POLICY
The department participates in a program designed to give master’s level graduate students an opportunity to develop an interdisciplinary specialization in environmental policy. See Economics for program description.

MINOR IN GERONTOLOGY
Graduate students in the Department of Sociology may pursue a specialized minor in gerontology. This interdisciplinary minor gives the student an opportunity for combining the knowledge about aging American society with his/her major concentration. Please refer to the Office of Graduate Admissions and Records.

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

GRADUATE COURSES

405 Sociology of Sport (3) Social meaning, organization, and process of sport. Prereq: 291 or consent of instructor.
414 Sociology of Health Care (3) Organization of health care facilities, staff-patient relationships, demographic characteristics, and prevalence of disease.
415 Sociology of Aging (3) How roles and statuses change with age in relation to major social institutions; impact that rapidly increasing number of older people has on society, effect of society on older people.
448 The Modern World System (3) Critical examination of capitalist world-system as social system, its coherence, boundaries, regions, member groups, cleavages, and patterns of conflict. Analysis of who gets what, why, and how in global political economy.
455 Society and Law (3) How laws and legal processes are affected by social change, social impact of legal sanctions, relations between law and social justice.
459 Organizational and Corporate Crime (3) Analysis of crime and deviance committed by organizations. Case studies of corporate and organizational crime, organizational dynamics of crime, theories of corporate crime, and organized responses to this type of crime by governmental regulatory agencies.
462 Population (3) Demographic factors and social structure; trends in fertility, mortality, population growth, migration, distribution, and composition; population policy.

464 Urban Ecology (3) Relation of humans to their urban environment: conservation and use of appropriate technology. (Same as Urban Studies 464.)
471 Sociolinguistics (3) (Same as English 471 and Linguistics 471.)
490 Diffusion of Agricultural Technology (3) (Same as Rural Sociology 480.)
500 Thesis (1-15) P/NP only. E
502 Registration for Use of Facilities (3-15) Required for the student not otherwise registered during any semester when student uses University facilities and/or faculty time before degree is completed. May not be used toward degree requirements. May be repeated. S/NC only. E
504 Sociological Foundations of Political Economy (3) Survey of contemporary sociological theories of political economy, sources of political and economic power and conflict.
505 Foundations of Criminology (3) Critical overview of contemporary developments in criminology, theories of crime causation and theories of responses to crime. Prereq: 350 or equivalent.
507 Foundations of Social Psychology (3) Current and classical theoretical perspectives in social psychology.
510 Teaching Sociology (3) Art and craft of teaching sociology from curricular considerations through teaching techniques. May be repeated. Maximum 6 hrs.
521 Sociological Theory I (3) Assessment of what sociological theory is; its major figures and their approaches to understanding society.
531 Research Methods in Sociology (3) Research design, measurement, sampling, quantitative and qualitative data collection techniques, data, reduction, and analysis.
534 Advanced Sociological Analysis (3) Underlying assumptions and logical procedures used by sociologists in formulating explanations; foundations of sociological research strategies and techniques.
540 Occupations (3) Occupations in relation to individuals and society, technology, economic stratification, and social organizations.
541 Collective Behavior, Social Movements, Social Change (3) Basic theory and research on social movements, social impact of contemporary developments in social change and conflict.
543 Sociology of Development (3) Sociological theories and studies of development: modernization, colonization, community, dependency; comparative impact of various developments on social structure and change.
551 Delinquency and the Social Structure (3) How study of delinquency and juvenile justice is affected by the changing of social structure and change, changing demographic and institutional influences, and changing views about responsibility and punishment.
560 Environmental Sociology (3) Systematic treatment of current research in environmental sociology, social impact analysis and conflicts over environmental issues.
563 Demographic Techniques (3) Standard rates and measures of demographic variables, life table analysis, increment-decrement models, and survey techniques of population analysis.
580 Advanced Rural Sociology (3) (Same as Rural Sociology 580.)
591 Foreign Study (1-15) See College of Arts and Sciences.
592 Off-Campus Study (1-15) See College of Arts and Sciences.
Special Programs

(College of Arts and Sciences)

GRADUATE COURSES

510 Humanities Perspectives in the Arts and Sciences (2) Seminar on nature of inquiry in humanities. Emphasis on nature and special forms of human experience and its interpretation through study of formative texts and critical figures.

520 Natural Science Perspectives in the Arts and Sciences (2) Seminar on nature of inquiry in physical and biological sciences drawing on history of science, critical figures in shaping of scientific thought, and methodology for observation and experimentation in natural sciences.

530 Social Science Perspectives in the Arts and Sciences (2) Seminar on nature of inquiry in social sciences. Emphasis on methodology for observation and research in study of human beings, their social environments and their behavior.

Speech Communication

(College of Arts and Sciences)

John Haas, Head

Professors:
Julian, Faye D. (Liaison), Ph.D. ......... Tennessee
Lester, Lorayne W., Ed.D. ......... Tennessee
Yeomans, G. Allan (Emeritus), Ph.D. ......... Louisiana State

Associate Professors:
Ambrester, M. L., Ph.D. ......... Ohio
Buckley, J. E., Ph.D. ......... Northwestern
Cook, N. C., M.A. ......... Alabama
Glenn, Robert W., Ph.D. ......... Northwestern
Haas, John W., Ph.D. ......... Kentucky

Assistant Professors:
Ambler, R. S., Ph.D. ......... Ohio State
Arnold, Christina L., Ph.D. ......... Florida

Graduate courses in Speech Communication provide opportunities for students in a variety of disciplines to investigate how oral language can affect changes in the knowledge, the understanding, the ideas, the attitudes, or the behavior of other human beings.

GRADUATE COURSES

420 Communication and Conflict (3) Communication as significant factor in development, management, and resolution of conflict at interpersonal, small group, organizational or societal levels.

425 Interpersonal Health Communication (3) Interpersonal communication in health care settings: provider-client interactions, social support groups, stigma and disease, and contemporary models explaining use of health-related information.

440 Organizational Communication (3) Organizational setting, and variables of communication process that affect quality of human interaction both within and outside organization.

465 Studies in Rhetorical History and Criticism (3) May be repeated. Maximum 6 hrs.

466 Rhetoric of the Woman's Rights Movement to 1930 (3) Historical and critical study of public address in campaign for women's rights in United States from 1830's through 1920's. (Same as Women's Studies 466.)

475 Rhetoric of the Contemporary Feminist Movement (3) Historical and critical study of rhetoric in campaigns for women's rights in United States from 1840's to present. (Same as Women's Studies 476.)

480 Ensemble Interpretation (3) Study and presentation of literary texts through group performance.

570 Legal and Ethical Issues of Communication (3) Communication rights and responsibilities. Prereq: Consent of instructor.

590 Directed Reading and Research (3) May be repeated. Maximum 6 hrs.

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

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

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

Sport and Physical Activity

(College of Education)

MAJORS

Human Performance and Sport Studies .................................................. M.S.

D. Kelley, Leader

Professors:
Lay, Nancy E. (Emeritus), Ph.D. ......... Florida State
Watson, Helen B. (Emeritus), Ph.D. ......... Michigan

Associate Professor:
Jones, Ralph E., Ph.D. ......... Toledo
Kelley, Dennis R., Ph.D. ......... Georgia State

Assistant Professors:
Borovski, Patricia C., M.S. ......... Tennessee
McCutchen, M. G., Ed.D. ......... North Carolina (Greensboro)

The Sport and Physical Activity unit offers a master's degree with a major in Human Performance and Sport Studies, concentration in sport administration/management (an interdisciplinary concentration with Health, Leisure and Safety Sciences). See Education under Fields of Instruction for full description of degree requirements.

Elective courses are offered in dance. These courses are appropriate for students interested in management of dance studios, teaching dance, or dance performance.

Specific questions about the program should be directed to the unit leader.

ADMISSION REQUIREMENTS

Applicants are required to complete the unit application which will be sent to all persons upon their initial inquiry about the program. Preference will be given to students with an overall undergraduate GPA of 3.0 or higher. Students with a GPA between 2.7 and 2.99 are encouraged to submit GRE scores.

The following retention policy applies to all graduate students seeking a degree in this unit:
1. Graduate students are required to maintain an overall 3.0 GPA.  
2. Any student who falls below this standard will be advised in writing by the unit leader of the need to discuss the matter with his/her advisor.  
3. If a student's overall GPA remains below 3.0 for a second semester, the student will have his/her degree status revoked.

**GRADUATE ASSISTSHIPS**

A limited number of graduate assistantships are available for qualified women and men who are graduates of accredited colleges or universities. These assistantships are open to students in the master's program. Students interested in these opportunities should file their applications before February. Letters should be addressed to Graduate Assistantships Coordinator, Sport and Physical Activity unit, The University of Tennessee, Knoxville, TN 37996-2700.

**Sport Management**

**GRADUATE COURSES**

415 Managing Leisure/Sport and Related Facilities (3) (Same as Recreation and Leisure Studies 415.)

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

501 Special Project (3) Culminating experience for non-major. Research study suitable for publication, or practicum requiring special written work. Prereq: 592.

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


511 Administration/Supervision In Sport (3) Development of knowledge and analytic skills desirable for managers/administrators in sport business/organization: organizational, administrative, and supervisory strategies related to sport in profit and non-profit settings.

512 Application of Legal Concepts to Sport Settings (3) Application of contract law, breach of contract, and monetary damages within sport settings; risk assessment and development of effective risk management strategies; development of contracts in sports; and analysis of cases involving discrimination based upon gender, race, and age as well as protection of rights at amateur and professional levels of sport. Sp

532 Research Techniques in Sport (3) Evaluate, compare, and contrast research techniques in sport with consideration for and experiences in appropriate review, design, and analysis procedures, and proposed development. F

535 Ethics in Sport Administration (3) Development of ethical and knowledge skills desirable of middle and upper level managers in administration of sport business/organization. Social issues and ethics in sport administration. F

541 Management and Operation of Recreation and Sport Related Facilities (3) (Same as Recreation and Leisure Studies 541.)

544 Theories of Leadership and Leader Behavior in Sport (3) Integration of various theoretical approaches to leadership styles in sport administration with cultural contexts, research, and field experiences. Sp

553 Case Studies in Sport Administration (3) Current issues and problems in sport administration at all levels of amateur and professional sport. F

554 Readings in Sport Administration (3) Survey of pertinent literature in refereed and applied journals and texts. E

555 Assessment of Sport Programming Needs (3) Development and assessment of approaches and/or instruction for purpose of evaluation, research, feasibility studies, and needs assessment in sport administration/management: qualitative and quantitative techniques. Prereq: 532.

570 Event Management (1-3) Review of current research related to theory and practice in event management and involvement in management capacity with one or more special events. Sp

580 Special Topics (1-3) Advanced study in selected disciplinary or professional areas of physical education and/or sport. May be repeated.

590 Practicum (1-3) Intern experience in areas of major interest. May be repeated. S/N only.

593 Independent Study (1-3) May be repeated. S/N or letter grade. E

595 Internship (3) Full-time application of previous theoretical and applied knowledge and skills in appropriate sport setting. S/N only. E

**Dance**

**GRADUATE COURSES**

415 Teaching Creative Dance for Children (2) Theory, methods, materials, and practical experience in presentation and integration of creative dance in grades K-6. Mini-teaching experience.

480 Dance Through the 19th Century (3) Dance of various societies and culture from pre-history through 19th century.

490 Dance in the 20th Century (3) History and philosophy of dance.

495 Dance Pedagogy (3) Principles and methods of teaching dance with practical application in mini-teaching experience. Prereq: Upperclass or graduate standing and consent of instructor.

**Statistics**

(College of Business Administration and Intercollegiate Program)

**MAJORS**

**DEGREES**

Statistics

M.S.

Business Administration

MBA

William C. Parr, Head

Professors:

Bozdogan, Hamparsum, Ph.D. .......... Illinois State

Guess, Frank M., Ph.D. ................. Florida State

McLean, Robert A. (Emeritus), Ph.D. .... Purdue

Mee, Robert W. (Liaison), Ph.D. ........ Iowa State

Parr, William C., Ph.D. ............... Southern Methodist

Philpot, John W., Ph.D. ............... VPI

Sanders, Richard D., Ph.D. ............. Texas

Schmidhammer, James L., Ph.D. ...... Pittsburgh

Sylwester, David L., Ph.D. ............. Stanford

Thigpen, Charles C. (Emeritus), Ph.D. .... VPI

Associate Professors:

Leitnaker, Mary G., Ph.D. ............ Kentucky

Leon, Ramon V., Ph.D. ............... Florida State

Lin, Dennis K. J., Ph.D. .............. Wisconsin

Walker, Esteban, Ph.D. ............... VPI

Younger, M. S., Ph.D. ............... VPI

Lecturer:

Schmidhammer, James L., Ph.D. ...... Pittsburgh

**Additional Intercollegiate Program Faculty:**

Bunting, Dewey, Arts and Sciences; Chatterjee, Arun, Engineering; Dessart, Don, Education; Fitzpatrick, Ben, Arts and Sciences; Fribourg, Henry, Agricultural Sciences and Natural Resources; Gant, Michael, Arts and Sciences; Gilsson, Charles, Social Work; Groce, Louis, Arts and Sciences; Huck, Schuyler, Education; Ladd, R. T., Business Administration; Lounsbury, John, Arts and Sciences; Lyons, William, Arts and Sciences; McLemore, Dan, Agricultural Sciences and Natural Resources; Miller, Mark, Communications; Orton, John, Social Work; Flood, Donald, Arts and Sciences; Rajput, Balram, Arts and Sciences; Richardson, Jr., Lillard, Arts and Sciences; Rosinski, Jan, Arts and Sciences; Saxton, Arnold, Agricultural Sciences and Natural Resources; Singletary, Michael, Communications; Smith, Julius, Arts and Sciences; Wagner, Carl, Arts and Sciences.

**THE MASTER'S PROGRAM**

The M.S. program in Statistics provides students with the foundations in theory and practice required for careers in applied statistics. In addition to the education traditionally offered in such a program, the department offers a concentration in industrial statistics, which provides unique opportunities for students interested in practical applications of statistics. Through involvement in the University of Tennessee Institute for Productivity Through Quality and related programs, department faculty participate in a variety of consulting and research projects in industry. Students may supplement their classroom study with an internship or participation in research projects dealing with industrial problems. Department faculty also collaborate with researchers from many academic disciplines and hold joint appointments with the College of Agriculture, the Computing Center and the Medical Center. Statistics graduate students may gain consulting experience by working with faculty involved in these consulting activities. All students are encouraged to participate in supervised internship or consulting activities as part of their graduate program. Students in the M.S. program may work on graduate assistantships in other disciplines are encouraged to enter the program. The candidate's mathematics background should include differential and integral calculus of several variables. Students with limited mathematics background should seek departmental guidance regarding specific ways in which they may prepare themselves for the program by taking coursework as non-degree students. Requests for application forms and further information may be sent to the Director of Graduate Studies, Department of Statistics, Stokely Management Center, University of Tennessee, Knoxville, TN 37996-0532.

**Admission Requirements**

General admission requirements for The Graduate School are stated beginning on page 12. Applicants to Statistics must submit results of the Graduate Record Examination (GRE) general portion, although GMAT exam scores may be substituted. Applicants for the statistics program must have completed at least two years of college-level mathematics, including the calculus of several variables and matrix algebra and be proficient in a computer.
in Statistics must pass the two-part comprehensive examination with the Executive Committee. That program will specify the sequences of statistics courses, chosen from the IGSP approved list, that are considered appropriate by the home department. Students who wish to participate in this program should contact their college representative or the Chair of IGSP in the Department of Statistics.

2. The student’s graduate committee must include a faculty member of the Department of Statistics at the rank of Assistant Professor or above.

3. The student’s Admission to Candidacy form must contain all courses required for the chosen degree program set off in a group labeled “Statistics Courses Required for the Minor or M.S. in Statistics.” Should the student not decide to apply for admission to the program until after completion of some of the courses, the student’s major professor should file a program change with the cooperating departments and assist the student in obtaining a Department of Statistics faculty member to serve on the student’s graduate committee.

Successful completion of the Statistics M.S. curriculum requires recognition of the student’s transcript. Students who do not complete the requirements of the minor or M.S. will still receive academic credit for the statistics courses they have successfully completed.

BUSINESS ADMINISTRATION CONCENTRATION

For complete listing of MBA program requirements, see Business Administration. MBA Concentration: Statistics.

Minimum course requirements are 571, 566, 572 with prereq or coreq of 561.

Ph.D. Concentration: Statistics

This degree provides students with a broad knowledge of the field of statistics, the ability to apply statistics in practical situations to problems of business and industry and the ability to develop new statistical methods; all of which takes place while students are exposed to coursework in the basic functional areas of business.

Minimum course requirements are: 673, 666, 691, and 546.

ACADEMIC STANDARDS

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

GRADUATE COURSES

411 Introduction to Statistical Computing (3) Use of computer operating system commands and packaged programs for statistical analysis and file management. Not available for credit for statistics majors. Prereq: 201 or 251.

461 Applied Regression Analysis (3) Linear regression and correlation, multiple regression, polynomial regression, selection of variables, use of dummy variables, analysis of residuals. Logistic regression and its applications. Use of standard computer packages. Major writing requirement. Prereq: Probability and Statistics for Scientists and Engineers I and Introduction to Statistical Software or graduate standing and consent of instructor. F.

462 Analysis of Variance and Experimental Design (3) Analysis of variance techniques for single and multifactor models, past hoc procedures. Design considerations for completely randomized, hierarchical and split-plot experiments, balanced incomplete block and designs, response surface methodology. Major writing requirement. Prereq: Probability and Statistics for Scientists and Engineers II and Introduction to Statistical Software or graduate standing and consent of instructor. Sp.

471 Random Processes and Probability Models (3) Functions of random variables, multivariate distributions, conditional expectations, waiting time distributions, random processes, Markov chains, queuing theory. Prereq: 261. F.

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

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


531 Survey of Statistical Methods I (3) Univariate and bivariate data collection and organization; statistical estimation and hypothesis testing; analysis of relationships for categorical and numerical data, including Chi-square tests and simple and multiple regression. Use of computer facilities required. Credit not given for both 531 and 537. Prereq: 1 yr. college mathematics. E.

532 Survey of Statistical Methods II (3) Multiple linear regression, including use of dummy variables; single and multiple factor analysis of variance and covariance; issues in experimental design and analysis. Use of computing facilities required. Prereq: 531. E.

537 Statistics for Research (3) Principles and application of statistical methodology, integrated with considerable use of major statistical computing systems. Probability and sampling distributions, forming and testing hypotheses using parametric and nonparametric inference methods. Basic random number generation and simulation. Credit not given for both 531 and 537. Prereq: 1 yr undergraduate mathematics and 1 undergraduate statistics course. Sp.

538 Statistics for Research II (3) General linear model as applied to multiple regression and analysis of variance; diagnostic and influence techniques. One-way, factorial, blocking, and nested designs, preplanned versus post-hoc contrasts. Random factors and repeated measures. Prereq: 537 or 532. F.

561 Introduction to Computing for Data Management and Analysis (1) UT Computing environment for beginning statistics graduate students. Use of operating system commands, system commands, utility programs and SAS statistical packages for data entry and editing, file management and statistical analysis. Use of UTCC computing facilities required. Coreq 531, 537 or 571, or consent of instructor.

Textiles, Retailing, and Interior Design

(College of Human Ecology)

MAJORS

DEGREES

Interior Design .................. M.S.
Textiles, Retailing and Consumer Sciences .................. M.S.
Human Ecology .................. Ph.D.

Nancy B. Fair, Head

Professors:
Blaikmore, R. G. (Emeritus), Ph.D. Florida State
De Jonge, Jacquelyn O., Ph.D. Iowa State
DeLong, A. J. ( Liaison), Ph.D. Penn State
Drake, Mary Fran, Ph.D. Pennsylvania State
Duckett, Kermit E., Ph.D. Tennessee
Wadsworth, Lary C., Ph.D. ............... NC State

Associate Professors:
Brosee, Randall R. (Liaison), Ph.D. Florida State
Dyer, C. L. (Liaison), Ph.D. ............... North Carolina
Fair, Nancy B., Ph.D. .................... NC State
Fairhurst, Ann E., Ph.D. ............... Oklahoma State
Rabon, Josette, Ph.D. ............... Tennessee

Graduate Program Information

The Department of Textiles, Retailing, and Interior Design offers master's degrees in Interior Design and in Textiles, Retailing and Consumer Sciences. The program in Textiles, Retailing and Consumer Sciences offers concentrations in textile science and in textile retailing and consumer sciences. An interdisciplinary minor in gerontology gives the graduate student an opportunity for combining the knowledge and experience about aging in American society with his/her own major concentration.

The master's program in Interior Design provides a balance between creative and theoretical foundations of the field; emphasis is placed on the dissemination of knowledge. The goal of the graduate program in interior design is to provide the student with scholarly and professional experiences through seminars, studio work, and research. Interdisciplinary thrusts increase the depth of understanding of the field of interior design essential to function as educators or as independent professionals. Areas of emphasis within interior design include: historic preservation/adaptive use and environmental behavior.

The programs in Textiles, Retailing and Consumer Sciences prepare students for careers in industry, business, public and private agencies, and educational institutions. Master's level work enables students to conduct research in retail management and merchandising and in the consumer areas related to retail decision making. Students in textile science are expected to have a solid foundation in mathematics, as well as a formal background in a physical science or engineering.

Interested students should contact the department head for more information.

ADMISSION REQUIREMENTS

A complete file for review includes the Graduate School application fee, the Department of Textiles, Retailing, and Interior Design application, Graduate Record Examination (GRE) scores for the general section, and three Graduate School Rating Forms completed by individuals who can attest to the potential for graduate education. Forms may be obtained from the Dean's Office, College of Human Ecology.
In addition to specified entrance requirements stipulated by The Graduate School, admission to the particular programs in the department is based on the following requirements:

**Interior Design**

Admission to the master's degree program with a major in Interior Design requires:
1. a background in interior design, 2) a cumulative GPA of 3.0 or above (on a 4.0 scale), and 3) a portfolio of undergraduate studio work (and professional work, if applicable) submitted to the department. The portfolio may include slides or original work. It is recommended that deficiencies in preparation, as identified in the admission process, be removed prior to full admission to the graduate program.

**Textiles, Retailing and Consumer Sciences**

Admission to the master's degree program with a major in Textiles, Retailing and Consumer Sciences is dependent on completion of undergraduate coursework that give the necessary background for success in the graduate program. For the concentration in Retail and Consumer Science, students should have an adequate background in retailing and/or consumer science supported by coursework in economics, marketing, mathematics, and statistics. For the concentration in textile science, students should have a basic technical background in textile science or materials science supported by mathematics through differential equations, organic chemistry, and general physics. Superior students deficient in one or more of the above requirements, may be admitted at the discretion of the department's graduate faculty.

**THE MASTER'S PROGRAMS**

**Interior Design**

The M.S. in Interior Design requires the completion of 36 hours of graduate credit. The requirements for the degree include the following: 18 hours (including 510, 564, 573, and 590 - students must enroll in 590 during the first two semesters in the program); a cognate area, 6 hours; research methods, 3 hours; statistics, 3 hours; a comprehensive design/project research with acceptable documentation, a publishable paper with outside review, or a thesis, 6 hours; a comprehensive examination by the student's committee on the project/research conducted.

Based on interest and prior background, each student has a choice of the areas of emphasis within the interior design program beyond the core curriculum. Emphases may include historic preservation and/or adaptive use or environment-behavior, or any acceptable combination (e.g., an adaptive use project with an emphasis on behavioral aspects). Areas within the environment-behavior emphasis considered appropriate are proxemics, environments for the elderly or children, or professional design.

Each student is required to demonstrate competence in individual research either through the thesis or non-thesis option (a comprehensive design/research project).

**Non-Thesis Option**: Complete a comprehensivedesign project with acceptable documentation or publishable paper. To be eligible, the student must have completed 12 hours of graduate credit in interior design with at least a 3.0 GPA. Having met this criteria, the student must present a proposal to the supervisory committee that will include 6 hours of subsequent coursework. This proposal must outline the nature of the project and/or paper and explain the methodological approach. A comprehensive oral and written examination, administered by the committee, will occur upon the completion of the program.

**Textiles, Retailing and Consumer Sciences**

The major in Textiles, Retailing and Consumer Sciences has concentrations in Retail and Consumer Sciences and in Textile Science. Requirements are listed below.

- A comprehensive oral examination, administered by the thesis committee, will be given upon completion of the thesis research. A non-thesis option is not available.

**The Ph.D. Concentrations**

**Consumer Environments**

Students enrolled in the Ph.D. program with a concentration in consumer environments are provided with a foundation in management and retail and consumer sciences or in understanding the consumer in the designed environment and management of facilities. From this base, students focus on retail and consumer sciences or on areas of specialization including historic preservation and adaptive use, human environment interaction and facilities management to further theory and application in advanced study and research. See the consumer environments concentration under Human Ecology.

**Textile Science**

Students enrolled in the Ph.D. program in Human Ecology with a concentration in textile science take one common course which provides a foundation for the integration of textiles and apparel in the context of the natural environment. A required departmental research seminar exposes students to research being conducted in all areas of study in the department.

1. College Professional Seminar, HE 610 (3 hours);
2. RCS 552 (3 hours);
3. Research Methods which must include 6 hours of laboratory techniques in materials analysis and characterization.

**ACADEMIC STANDARDS**

1. Evaluation of student progress will normally occur prior to enrollment for thesis hours (or the non-thesis option) and during the second semester of full time enrollment in the program. The review of the student will be undertaken by the faculty with consideration given to factors such as: GPA (minimum 3.0), portfolio evaluation, and demonstrated research capability.

2. If progress or performance is deemed insufficient, the faculty may recommend probation with specific goals set for a specified time or termination.

**ACADEMIC COMMON MARKET**

An agreement among southern states for sharing graduate programs allows legal residents of certain states to enroll in certain programs at UT Knoxville on an in-state tuition basis. The M.S. program in Interior Design is available to residents of the states of Louisiana, Mississippi, or Virginia. The M.S. program in Textiles, Retailing and Consumer Sciences is available to residents of the state of Mississippi. Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records. For the Ph.D., see Human Ecology.

**Interior Design**

**GRADUATE COURSES**

400 Proxemics (3) Space and behavior within cultural context. Application to design and design process. Theoretical foundations and concepts from environment and behavior. Simulation techniques and methods for identifying behavioral design requirements. Prereq: Human Environment Systems and Microcomputer for Interior Design or consent of instructor. F

450 Advanced Interior Design II (5) Comprehensive studio problems of advanced complexity; integration and extension of experiences utilizing systematic design methodologies. Prereq: Advanced Interior Design or consent of instructor. 2 hrs and 3 labs. Sp

470 History of Contemporary Interior Architecture (2) Interior architecture, furniture, design philosophies, and aesthetic qualities from neoclassical to modern. Prereq: History of Interior Architecture or consent of instructor. Sp

475 History of American Interior Architecture (3) Major styles of interior architecture, decoration, and architectural forms. Renewal of medieval and Renaissance arts within cultural context, colonial and native through the modern era. Prereq: 370 or consent of instructor. Sp

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

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

510 Retail Strategy and Decision Making (3) Strategy, strategic management and strategic process in retail sector. Analytical decision-making skills in retailing. Retail industry structure. International differences in retail systems. Prereq: Retail Management or equivalent. 


520 Integrative Interior Design Studio (3) Identification, integration, and synthesis of multidisciplinary data input. Advanced programming techniques and design evaluation. Lecture and studio. Prereq: 510, 564, or consent of instructor. Sp

531 Research Methods in Historic Preservation (3) Methodology for historic preservation problems in interior design. Prereq: Architecture 403 or consent of instructor. Sp

564 Environmental Factors in Interior Design (3) Human factors and associated research techniques and design methodologies related to interior architectural environments. Design requirements from anatomy, physiology, anthropology and social and behavioral sciences. Prereq: 6 hrs behavioral science and 6 hrs natural science, or consent of instructor. Sp

573 Applied Research Strategies in Interior Design (3) Synthesis of research methods, statistics, and design research issues within framework of creating viable research proposals.

575 Environment and Aging (3) Seminar on design of physical environment and relationships to aging process. Concepts and theories from design, and social and behavioral sciences. Prereq: 6 hrs social behavioral science or consent of instructor. Sp

580 Directed Study in Interior Design (1-3) Independent advanced research in selected areas of field of interior design. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. E

581 Directed Study in Historic Preservation (1-3) Independent advanced research in historic preservation relevant for interior design. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs. E

584 Directed Study in Environmental Design (1-3) Independent advanced research in environmental design analysis. Prereq: 574 or consent of instructor. May be repeated. Maximum 9 hrs. E

590 Research Seminar (1-2) S/NC only. E

599 Dissertation (3-15) S/NP only. E


615 Retail and Consumer Sciences Literature and Thought (3) Evaluation of retail and consumer sciences literature with emphasis upon research literature, development of scholarly thought, and identification of potential areas of further study. Prereq: 562, Marketing 501, Economics 501, F, A

616 Research Methods, Models and Measurement in Retail and Consumer Sciences (3) Quantitative methods and analytical concepts in research process. Methodology and statistical analysis of consumer sciences phenomena, utilizing models, model building and measurement constructs. Prereq: 562, Statistics 538, Sp, A

641 Retail Consumer Behavior (3) Theories and concepts from social science in relation to ultimate consumer's behavior. Prereq: 6 hrs of sociology or psychology or consent of instructor.

651 The Consumer and Public Policy (3) Public policy issues within consumer environments. Analysis of past and present policies within economic, social, and business framework. Implications of consumer issues and policy alternative literature and research focus. Prereq: 550 or consent of instructor.

695 Advanced Topics in Retail and Consumer Sciences (3) Lecture, group discussion, individual research on advanced topics and research areas of current significance to retail and consumer sciences. Prereq: 9 graduate hours in consumer sciences. May be repeated. Maximum 9 hrs.

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

510 Fiber Science (3) Physical properties, mechanical properties and structure of polymeric fibers; relation to end-use properties. Prereq: Organic Chemistry and Thermal Physics or equivalent.

520 Optical Microscopy (4) Basic compound and polarizing microscopy for imaging. Optical property measurements, and structure elucidation. Other methods of optical microscopy. Prereq: Fundamentals of Physics; Wave Motion, Optics and Modern Physics or equivalent. 3 hrs and 2 labs.

521 Nonwoven Science and Technology I (3) Nonwoven fabric technology; different web forming processes and relationships among the chemical, morphological and mechanical properties of fibers and orientation in webs to final performance of bonded structures. Prereq: Organic chemistry or consent of instructor.

524 Advanced Textile Designing and Finishing (4) Chemistry, processing and finishing of natural fibers and various varieties of dyes on different fibers. Prereq: 510 or consent of instructor. 2 hrs and 4 labs. Sp

528 Nonwoven Science and Technology II (3) Interrelations between mechanics of production and mechanical properties of nonwoven fabrics; characterization of fiber morphology and structure; chemistry of nonwoven binders and finishes; and engineering of specific fiber fabrics. Prereq: 521 or equivalent.


590 Research Seminar (1) Research topics in textile science. May be repeated. S/NC only. F, Sp

593 Directed Study (1-3) Independent problems in retailing and consumer sciences. Prereq: 9 hrs retailing and consumer sciences graduate coursework. May be repeated. Maximum 9 hrs.

600 Dissertation (3-15) S/NP only. E

625 Physical Chemistry of Fibers (3) Physical chemistry of fibers and forming polymers; surface chemistry and thermal properties. Prereq: 510.

626 Physics of Fiber Structures (3) Morphology of polymeric structures; thermal and processing history on mechanical, electrical and chemical properties of fibers. Prereq: 510.


695 Advanced Topics in Textile Science (3) Lecture, group discussion, individual research on advanced topics and research areas of current significance: future direction, professional issues, theoretical approaches. Prereq: Doctoral student and 9 hrs textiles graduate coursework. May be repeated. Maximum 9 hrs.

Textile Science

GRADUATE COURSES

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

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

507 Advanced Topics in Textile Science (3) Lecture, group discussion, individual research on advanced topics and research areas of current significance to textile science. Prereq: 9 graduate hours in textiles. May be repeated. Maximum 9 hrs.

520 Optical Microscopy (4) Basic compound and polarizing microscopy for imaging. Optical property measurements, and structure elucidation. Other methods of optical microscopy. Prereq: Fundamentals of Physics; Wave Motion, Optics and Modern Physics or equivalent. 3 hrs and 2 labs.

521 Nonwoven Science and Technology I (3) Nonwoven fabric technology; different web forming processes and relationships among the chemical, morphological and mechanical properties of fibers and orientation in webs to final performance of bonded structures. Prereq: Organic chemistry or consent of instructor.

524 Advanced Textile Designing and Finishing (4) Chemistry, processing and finishing of natural fibers and various varieties of dyes on different fibers. Prereq: 510 or consent of instructor. 2 hrs and 4 labs. Sp

528 Nonwoven Science and Technology II (3) Interrelations between mechanics of production and mechanical properties of nonwoven fabrics; characterization of fiber morphology and structure; chemistry of nonwoven binders and finishes; and engineering of specific fiber fabrics. Prereq: 521 or equivalent.


590 Research Seminar (1) Research topics in textile science. May be repeated. S/NC only. F, Sp

593 Directed Study (1-3) Independent problems in retailing and consumer sciences. Prereq: 9 hrs retailing and consumer sciences graduate coursework. May be repeated. Maximum 9 hrs.

600 Dissertation (3-15) S/NP only. E

625 Physical Chemistry of Fibers (3) Physical chemistry of fibers and forming polymers; surface chemistry and thermal properties. Prereq: 510.

626 Physics of Fiber Structures (3) Morphology of polymeric structures; thermal and processing history on mechanical, electrical and chemical properties of fibers. Prereq: 510.


695 Advanced Topics in Textile Science (3) Lecture, group discussion, individual research on advanced topics and research areas of current significance: future direction, professional issues, theoretical approaches. Prereq: Doctoral student and 9 hrs textiles graduate coursework. May be repeated. Maximum 9 hrs.

Theatre

(College of Arts and Sciences)

MAJOR DEGREE

Theatre .................................................... M.F.A.

Tom Cooke, Head

Professors:

Cooko, Tom, Ph.D. Florida State University

Verhulst, E. C. Florida State University

Farr, B. J. Florida State University
The Department of Theatre offers the Master of Fine Arts degree with a major in Theatre, concentrations in acting, scene design, costume design, lighting design and theatre technology. Not all areas of concentration accept applicants every year.

Applicants must have completed undergraduate degrees approximately equivalent in requirements to those specified for degrees conferred by The University of Tennessee, Knoxville.

The Graduate record Examination, three letters of recommendation and interviews with appropriate faculty are required of all applicants. Applicants for admission to the M.F.A. design/technical theatre programs must submit samples of their work. Auditions are required of M.F.A. degree acting applicants.

For detailed information about the graduate program, contact the Director of Graduate Studies, Department of Theatre.

THE MASTER OF FINE ARTS PROGRAM

At least 60 semester hours, 40 of which must be at the 500 level or above, are required for the degree of Master of Fine Arts with a major in Theatre, which is normally to be completed in three consecutive years of full-time residence. Theatre 501 is required the first year of residence. Theatre 510 and 512 are also required of all students. Students in the M.F.A. degree program are evaluated annually by joint performance or portfolio submission. Continuation in the program is with the approval of the faculty committee for the M.F.A. degree program. Theatre 599, Projects in Lieu of Thesis, and an oral defense of the project must be completed satisfactorily before the degree is conferred.

In addition to the core requirements listed above, each area of concentration has specific requirements:

**Design/Technical Production**

Required courses are at least 12 hours of Theatre 580, Design and Technical Production Seminar, and at least 6 hours in the projects courses. Theatre 401, Principles of Design is required in the first year of residence.

**Acting**

Theatre 500-21-22-23-24-25 Master Class are required, along with one course in directing and two hours each in voice and dance.

**REQUIREMENTS FOR SECOND MASTER’S DEGREE**

Students admitted to the MFA program who have already earned a master’s or a doctoral degree may apply up to 12 credit hours from the previous graduate program to the MFA degree with approval of the student’s committee, the Dean of the College of Arts and Sciences, and the Dean of The Graduate School.

Any such credits applied from a previous graduate program could be from courses that are directly relevant to the student’s MFA curriculum and must have been earned within the time limit (6 years) established for completion of the MFA degree.

**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 and pay an in-state tuition basis. The M.F.A. program in Theatre is available to residents of the state of Virginia (concentration in costume design only). Additional information may be obtained from the Admissions Specialist in the Office of Graduate Admissions and Records.

**GRADUATE COURSES**

401 Principles of Theatrical Design (3) Fundamental principles of design: visual and structural relationships. Projects assigned to develop understanding and perception.

409 Stage Make-up (2) Problems in make-up design and application, character analysis, physiognomy and chiaroscuro. Prereq: 100

420 Special Studies in Acting (3) Content varies. Exercises in selected concentrated areas such as styles, techniques, approaches, e.g., Shakespeare, movement, humor. Prereq: Advanced Acting and consent of instructor. May be repeated. Maximum 9 hrs.

423 Period Movement and Dance (2) Movement styles and dances from Renaissance to 20th century. Prereq: Stage Movement or consent of instructor.

424 Theatre Dance II (3) Advanced dance technique incorporating elements of musical theatre. Prereq: Theatre Dance or consent of instructor. May be repeated. Maximum 6 hrs.

425 Musical Theatre Techniques (3) Study and practice of musical theatre material: dance and vocal work. Prereq: Theatre Dance or consent of instructor. May be repeated. Maximum 4 hrs.

426 Applied Phonetics (3) Development of skills in transcription and reproduction of principal varieties of English Language in North America and Great Britain and selected foreign dialects in North America. Prereq: Consent of instructor.


445 Advanced Costume Construction (3) Advanced studies in construction technique, tailoring, vacuum forming, plastic molding, and cobbling. Prereq: 345 or consent of instructor.

446 Costume Pattern (3) Draping patterns for period costume. Construction and study of historic patterns. Prereq: 345 or consent of instructor.

450 Advanced Scenery Technology I (3) Study and practice of theatre woodworking; production participation required. Prereq: 250. Graduate credit to theatre M.F.A. students only.

451 Advanced Scenery Technology II (3) Study and practice of metalworking and plastics for theatrical productions; production participation required. Prereq: 250. Graduate credit to theatre M.F.A. students only.

452 Advanced Scenery Technology III (3) Study and practice of stage rigging for theatrical productions; production participation required. Prereq: 250. Graduate credit to theatre M.F.A. students only.

454 Scenery Painting (2) Introduction to materials, techniques, and principles of craft. Gaining skill and understanding through studio experience. Prereq: Consent of instructor.


456 Rendering (3) Techniques in monochrome and full color illustration of space and form. Prereq: Acquaintance with basic mechanical perspective and freehand sketching.

462 Advanced Lighting Design (3) Advanced problems in lighting design and theory, lighting musical theatre, opera, and dance. Prereq: 362 or consent of instructor.

464 Computer Assisted Design for Stage Lighting (3) Advanced techniques in computer-assisted design for stage lighting. Work with CAD and other stage-lighting software for preparation of lighting plots and associated paperwork. Prereq: Introduction to Lighting Design or consent of instructor.

465 Aesthetics of Lighting Design (3) Theory and practice of stage lighting design, relationship between designers and non-practitioners: directors, actors, choreographers, architects, etc.

470-71 Playwriting (3,3) Advanced instruction in writing of plays. Prereq: Consent of instructor.

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

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

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

501 Introduction to Graduate Research in Theatre (Research tools and methods for theatre artist and scholar.

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

510 Studies in Theatre History (3) Intensive study of selected topics in theatre history. May be repeated. Maximum 9 hrs.

512 Dramatic Literature Analysis (3) Dramaturgical strategies of major playwrights, using a variety of analytically approaches from Aristotelian to Structuralist.

520-21-22-23-24-25 Master Classes in Acting (4,4,4,4,4,4) Master classes teaching techniques, approach, and movement. Theatre M.F.A. students only.

536 Projects in Play Directing (3) Practical work in play direction involving various lengths and kinds of scripts. May be repeated. Maximum 9 hrs.

542 The Social History of Costume (3) Study and analysis of costume as related to society’s manners and mores, architecture and furniture.


551 Millinery for the Stage (2) Pattern making and construction techniques for hats from antiquity to present. Prereq: Consent of Instructor.

556 Advanced Costume Pattern Making (3) Advanced studies in patterning period costume. Development of historic patterns through flat pattern method. Prereq: 446.

571 Painting and Dying for Theatre (3) Fibers, dyes and dye processes; color matching and distressing.

649 Projects in Costume Technology (1-3) Individualized studies in costume technology in theatre production. Prereq: Consent of instructor. May be repeated. Maximum 6 hrs.

Transportation

See Marketing, Logistics and Transportation

Veterinary Medicine

(College of Veterinary Medicine)

MAJOR DEGREE

Veterinary Medicine .......... D.V.M.
Comparative and Experimental Medicine .......... M.S., Ph.D.

THE PROFESSIONAL PROGRAM

Admission Requirements

To qualify for admission to the professional program of the College of Veterinary Medicine, a candidate must have completed at least the minimum pre-veterinary course requirements listed below. These may be completed at any accredited college or university that offers courses equivalent to those at the University of Tennessee, Knoxville. Pre-veterinary course requirements must be completed by the end of the spring term of the year in which the student intends to enroll. Biochemistry requirements must have been satisfactorily completed within five years of the time the student wishes to enter the program.

Subject Area Semester Hours

English 6
Humanities and Social Sciences* 18
Physics 8
General Chemistry 8
Organic Chemistry 8
Biochemistry** 4
General Biology 8
Genetics 3
Cellular Biology*** 3
TOTAL 66

*May include, for example, courses in English literature, speech, music, art, philosophy, religion, language, history, economics, anthropology, political science, psychology, sociology and geography.

**Exclusive of laboratory.

***It is required that this requirement will be fulfilled by a course in cellular or molecular biology.

Admission Procedures

Admission of new students is for the fall semester, with first priority given to residents of Tennessee.

The College of Veterinary Medicine utilizes the Veterinary Medical College Application Service (VMCAS) for all applicants. Forms and instructions for making application for admission may be obtained beginning July 1, 1996 from the Office of the Associate Dean, The University of Tennessee, College of Veterinary Medicine, P.O. Box 1071, Knoxville, TN 37901-1071.

Note: The deadline for receipt of the completed application materials by VMCAS is November 1. NON-TENNESSEE APPLICANTS MUST HAVE A MINIMUM CUMULATIVE GRADE-POINT AVERAGE OF 3.2 ON A 4.0 SCALE.

Applications are accepted only from U.S. citizens or permanent residents of the U.S.

D.V.M. Curriculum

The curriculum of the College of Veterinary Medicine is a nine-semester, four-year program. Each class begins in August and graduates four years later in May. The first three years follow the traditional fall and spring semesters with the summer break following years one and two. The final year of the professional curriculum begins immediately following semester six and is a continuous clinical rotation experience extending over one calendar year.

The first year consists mostly of the pre-clinical subjects of anatomy, physiology, histology, and microbiology. Also included in this first year are clinical subjects of physical diagnosis and anesthesia. Considerable integration of subject matter is incorporated during this year.

The second and third years include the study of diseases, their causes, diagnosis, treatment and prevention, and courses are team-taught on an organ system basis.

The final year (three semesters) is devoted to intensive education in solving diagnostic problems involving extensive clinical experience in the Veterinary Teaching Hospital. Each student will rotate through a series of clinical blocks.

An innovative feature of this curriculum is the designation of semester six as one in which the individual student may select his or her courses of study. This allows select students who have specific educational goals (such as advanced or dual degree programs) to enroll in all, some, or none of the regularly scheduled courses during that semester. Students enrolled in the D.V.M. program are required to complete at least 16 credit hours in the sixth semester and may register for up to 10 credit hours of graduate courses without enrolling in the Graduate School and these hours will be credited toward the D.V.M. degree. This semester of elective study offers a unique educational alternative for select students in the CVM and is intended to enhance professional growth, concentration in an area of interest and career opportunities.

In addition to education in the science and art of veterinary medicine, students receive instruction in paramedical subjects such as animal behavior, medical communication, professional ethics, jurisprudence, economics, and practice management.

The curriculum requires successful completion of 152 semester credits.

THE GRADUATE PROGRAM

The College also administers a graduate program involving all departments which leads to the Master of Science and the Doctor of Philosophy degrees. Because of the interdisciplinary nature of the administration of the College of Veterinary Medicine, the faculty have opportunities in the graduate programs of other instructional units, including Animal Science (nutrition, physiology, genetics and animal management), Microbiology (bacteriology and immunity), Ecology and Evolutionary Biology (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. This program provides a wide spectrum of interdisciplinary training that prepares graduates for teaching and/or research careers in the health sciences.

PROFESSIONAL COURSES

811 Bacteriology and Mycology (4) Fundamental aspects of microbiology and cell biology relative to pathogenesis of bacterial and fungal diseases of animals; antimicrobial actions and mechanisms of bacterial resistance. General approach to diagnosis, treatment and prevention.


821-22 Anatomy I, II (4,4) Gross and applied anatomy: neural structures of common domestic animals; dog, cat, horse, cow. Dissection of embalmed specimens, sections, slides, models, and living animals.

823-24 Physiology I, II (4,4) Introduction to concepts and problems in physiology which from a general basis for clinical applications and for formal training in pharmacology, medicine, pathology, and surgery. Cellular, neural, cardiovascular, renal, respiratory, digestive, endocrine, and reproductive physiology.

851 Urinary System (3) Pathophysiology, special pathology, medicine and surgery of diseases of urinary system. Urinary system in health and disease.

852 Cardiovascular System (2) Pathophysiology, special pathology, medicine and surgery of diseases of cardiovascular system. Anatomic, physiologic and pharmacologic principles which provide basis for treatment.

853 Endocrine System (2) Pathophysiology, medicine and surgery of diseases of endocrine system. Mechanism of hormone and metabolic diseases: therapy and prevention.

854 Respiratory System (3) Pathophysiology, special pathology, medicine and surgery of diseases of respiratory system. Upper and lower respiratory system: infection and non-clinical application.

855 Radiology (3) Basic, advanced and special techniques in radiology with interpretation and use of radiologic and related techniques in diagnosis and treatment of animal diseases.

856 Special Senses (2) Pathophysiology, special pathology, medicine and surgery of diseases of visual and auditory systems.

857 Nervous System (3) Pathophysiology, special pathology, medicine and surgery of diseases of nervous system: clinical neurology and neuropathology.

858 Clinical Rotation in Specialties (2) Clinical training in specialty services: anesthesiology, ophthalmology or dermatology. Direct responsibility for diagnosis, patient care, and treatment of clinical cases in both urban and rural practice.

859 Clinical Clerkship (2) Advanced clinical training in urban practice, rural practice, environmental practice, and pathobiology. S/NC or letter grade.

857 Nervous System (3) Pathophysiology, special pathology, medicine and surgery of diseases of nervous system: clinical neurology and neuropathology.

856 Special Senses (2) Pathophysiology, special pathology, medicine and surgery of diseases of visual and auditory systems.

855 Radiology (3) Basic, advanced and special techniques in radiology with interpretation and use of radiologic and related techniques in diagnosis and treatment of animal diseases.

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852 Cardiovascular System (2) Pathophysiology, special pathology, medicine and surgery of diseases of cardiovascular system. Anatomic, physiologic and pharmacologic principles which provide basis for treatment.

851 Urinary System (3) Pathophysiology, special pathology, medicine and surgery of diseases of urinary system. Urinary system in health and disease.

831 Physical Diagnosis (1) Basic care, feeding, restraint, and handling domestic animals. Introduction to physical examination and diagnostic techniques used by veterinarian.

832 Anesthesiology (2) Principles of anesthesiology: pharmacology of anesthetic agents, and introduction to anesthetic techniques in veterinary medicine.

833 Epidemiology/Public Health (4) Principles of epidemiology and public health. Host-agent relationships, public health aspects of veterinary medicine, and role of veterinarian in ecology and food hygiene.

834 Hematopoietic System (3) Pathophysiology, special pathology, and clinical management of diseases of the hematopoietic and lymphoid organs and tissues.

835 Medical Interaction (2) Multidisciplinary laboratory and clinical observation of basic principles, pathologic principles underlying mechanisms of disease, selection of cases, and evaluation of human and animal diseases caused by common toxic agents.

840 Integumentary System (3) Pathophysiology, special pathology, medicine and surgery of diseases of integumentary system. Laboratory examination, pathology, diagnosis and treatment.

841 Reproductive System (4) Pathophysiology, special pathology, medicine and surgery of diseases of male and female reproductive systems and mammary glands.

842 Alimentary System (5) Pathophysiology, special pathology, medicine and surgery of diseases of alimentary systems.

843 Musculoskeletal System I (3) Pathophysiology, special pathology, medicine and surgery of diseases of muscular and skeletal systems. Basic principles, pathologic changes and radiographic interpretation.

844 Musculoskeletal System II (3) Pathophysiology, special pathology, medicine and surgery of diseases of muscular and skeletal systems. Advanced principles, radiographic interpretation and surgical procedures.

845 Principles of Medical Science (2) Physiologic and pathologic principles underlying mechanisms of disease. Selected examples of human and animal diseases: recent scientific advances in biomedical sciences.

846 Multispecies Medicine (4) Anatomy, pathophysiology, medicine and surgery of avian species, laboratory and zoo animals and reptiles. Species and diseases seen by practicing veterinarian. Current topics on foreign animal diseases.

848 Art of Veterinary Medicine II (1) Paramedical subjects important to veterinary practice: practice management, interpersonal relations, communication, jurisprudence, ethics, careers, animal behavior and veterinary history. May be repeated. S/NC only.

850 Introduction to Clinics (1) Clinical veterinary practice with discussions and practical experience. Problem-solving and integration of basic sciences with clinical applications. Problem-oriented veterinary medical record.

859 Clinical Clerkship (2) Advanced clinical training in urban practice, rural practice, environmental practice, and pathobiology. S/NC or letter grade.

858 Clinical Rotation in Specialties (2) Clinical training in specialty services: anesthesiology, ophthalmology or dermatology. Direct responsibility for diagnosis, patient care, and treatment of clinical cases in both urban and rural practice.

857 Nervous System (3) Pathophysiology, special pathology, medicine and surgery of diseases of nervous system: clinical neurology and neuropathology.

856 Special Senses (2) Pathophysiology, special pathology, medicine and surgery of diseases of visual and auditory systems.

855 Radiology (3) Basic, advanced and special techniques in radiology with interpretation and use of radiologic and related techniques in diagnosis and treatment of animal diseases.

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853 Endocrine System (2) Pathophysiology, medicine and surgery of diseases of endocrine system. Mechanism of hormone and metabolic diseases: therapy and prevention.

852 Cardiovascular System (2) Pathophysiology, special pathology, medicine and surgery of diseases of cardiovascular system. Anatomic, physiologic and pharmacologic principles which provide basis for treatment.

851 Urinary System (3) Pathophysiology, special pathology, medicine and surgery of diseases of urinary system. Urinary system in health and disease.

831 Physical Diagnosis (1) Basic care, feeding, restraint, and handling domestic animals. Introduction to physical examination and diagnostic techniques used by veterinarian.

832 Anesthesiology (2) Principles of anesthesiology: pharmacology of anesthetic agents, and introduction to anesthetic techniques in veterinary medicine.

833 Epidemiology/Public Health (4) Principles of epidemiology and public health. Host-agent relationships, public health aspects of veterinary medicine, and role of veterinarian in ecology and food hygiene.

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835 Medical Interaction (2) Multidisciplinary laboratory and clinical observation of basic principles, pathologic principles underlying mechanisms of disease, selection of cases, and evaluation of human and animal diseases caused by common toxic agents.
FACILITIES FOR RESEARCH AND SERVICE
FACILITIES FOR RESEARCH AND SERVICE
Facilities for Research and Service

Bureau of Educational Research and Service  
(College of Education)  
Carol E. Kasworm, Director  
Four major types of activities--research, development, educational services, and publications--are channeled through the Bureau of Educational Research and Service (BERS), located in 212 CEB. The research activities relate to the development of research proposals, conducting and/or assisting in research, and assisting others in development of research proposals in the College of Education. Educational services include a wide list of activities such as in-service educational programs, consultant services, and technical assistance 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.

Center for Business and Economic Research  
(College of Business Administration)  
William Fox, Director  
In its economic research endeavors, CBER today has the same basic mission determined at its inception 58 years ago at the request of the Tennessee Legislature--to produce and disseminate new information in the field of economic research and in the specific areas of regional economic development and fiscal policy. The mission has also expanded to include influencing decision quality in the public and private sectors and integrating departmental research through cooperative ventures in the international arena. In addition to the annual Economic Report to the Governor, the Survey of Business and the Tennessee Statistical Abstract, the Center publishes research on a wide range of socioeconomic and policy issues, including taxes, banking, telecommunications, environmental concerns, and employment prospects.  
While its core mission remains little changed, the scope of the CBER unit has expanded from a largely individualistic fiscal assistance program to a regional economic research, policy analysis, and communications technology arm of the College of Business Administration, with a staff of three senior research faculty and a support staff in research, Information technology and information dissemination, located at 100 Glocker.

Center for Information Studies  
(School of Information Sciences)  
W. David Penniman, Director  
The Center for Information Studies (CIS) was established in June 1989 to be a focal point for research related to information systems and services. The Center, located at 304 Temple Court, has performed research for the federal government, state and local governments, companies, etc. Projects have ranged from strategic planning efforts to information system and service evaluations, to modeling of scientific and technical communication. Staff of the Center have been actively involved in proposal development and project performance with faculty and staff in other centers and departments at the University.  
Areas of interest to the Center include information systems design, information organization and retrieval in very large databases, directories and locator tools in a networked environment, design of regional library and information system networks, new technology applications, Information system support for educational reform, modeling of information processes, development of measures and methods for evaluating information system performance and effectiveness.

Center of Excellence for Materials Processing  
The Center for Materials Processing is one of the "Centers of Excellence" created by the State of Tennessee. It has an inter-disciplinary program designed to bring together individuals with appropriate expertise to solve important materials processing problems. It emphasizes (1) the development of desirable materials properties through the control of composition, molecular structure and microstructure, (2) measurement of process variables, and (3) control of those variables to ensure proper processing. The Center conducts basic research and teaching in materials processing and carries out research to improve existing processing technologies and transfer of research results to private industry. A major aspect of the Center is student participation in industry-sponsored research programs. The Center is located in 102 Estabrook Hall, 974-0816.

Centers and Chairs of Excellence  
The Centers of Excellence grew out of Tennessee's Better Schools Program, an initiative to upgrade state-aided education at all levels. State officials and legislators wanted to give a few outstanding academic programs in state-aided universities a special push toward prominence, well beyond regular annual increases for all programs.  
In 1984, the General Assembly appropriated and the governor approved $10 million for the first Centers of Excellence throughout the state. The public colleges and universities submitted their proposals for Centers of Excellence to the Tennessee Higher Education Commission, which made the final determinations. Now four of the University's ten Centers of Excellence are sponsored by UT Knoxville or located in Knoxville.
Concurrently, the University has received state funding, which it must match dollar for dollar, for Chairs of Excellence. These Chairs are $1 million endowed professorships in areas of significance to the University and to the individual, foundation, or corporation providing the matching gift money. Chairholders are noted within their respective academic units. The Chairs of Excellence are:

Bernadette E. Schmitt Chair of Excellence in History
Bernard Blasingame Chair of Excellence in Agricultural Policy
Chair of Excellence in Science, Technology and Medical Writing
Clayton Homes Chair of Excellence in Finance
College of Business Administration Chair of Excellence in Policy Studies
Condra Chair of Excellence in Computer Integrated Engineering and Manufacturing
Condra Chair of Excellence in Power Electronics Applications
Goodrich Chair of Excellence in Waste Management and Environmental Engineering
Hodges Chair of Excellence in English
J. Fred Holly Chair of Excellence in Political Economy
Nancy Gore Hunger Chair of Excellence in Environmental Studies
Pilot Chair of Excellence in Management
Racheff Chair of Excellence in Ornamental Horticulture
Racheff Chair of Excellence in Materials Science and Engineering
Shumway Chair of Excellence in Romance Languages
Willis Lincoln Chair of Excellence in Physics

The combination of the Centers of Excellence and Chairs of Excellence adds a dimension to The University of Tennessee that is not easily equaled by other institutions. UT’s reputation as the premiere university in the state and as a regional and national leader in instruction, research, and public service is enhanced as a result of the infusion of these special funds.

For information concerning the individual centers sponsored by UT, contact:

Center for Livestock Diseases and Human Health
Dr. G. M. H. Shires, Director
College of Veterinary Medicine
UT Knoxville
Knoxville, TN 37996
(423) 974-7262

Center for Materials Processing
Dr. Carl McGargue, Acting Director
UT Knoxville
121 Perkins Hall
Knoxville, TN 37996
(423) 974-7608

Science Alliance
Dr. Thomas A. Callcott, Interim Director
UT Knoxville
101 South College
Knoxville, TN 37996
(423) 974-6765

Waste Management Research and Education Institute
Dr. Gary Saylor, Acting Director
Dr. Jack N. Barkenbus, Director of Operations
UT Conference Center, Suite 311
600 Henley St.
Knoxville, TN 37996-0710
(423) 974-4251

Child Development Laboratories
(College of Human Ecology)
Anne Miller Stott, Staff Director
The Child Development Laboratories, operated by the Child and Family Studies department within the College of Human Ecology since 1927, currently offer child care programs for young children ages six weeks to five years. The Child Development Laboratories serve three purposes: to promote observation, participation, and research activities of the department and other university faculty and students; to prepare undergraduate and graduate child development professionals for working effectively with young children; and to provide a model early childhood education program for children, families and early childhood professionals.

The programs are equipped with a tele-telemetry laboratory that features unique videotaping capabilities in all classrooms, small group research rooms, and observation booths that facilitate teacher training and research. A variety of research projects (such as the development of creativity in young children, emergent literacy, children's political socialization, mainstreaming, and peer interactions) involves students and faculty in the college and many departments on campus. Graduate Assistants in the Laboratories participate in teaching, assessment, administrative, supervisory and research activities while working with children and families under the guidance of faculty and staff. The Child Development Laboratories are accredited by the National Academy of Early Childhood Programs, a division of the National Association for the Education of Young Children.

Communications Research Center
(College of Communications)
The Communications Research Center, 426 Communications Bldg., is an adjunct to the communications graduate program. Objectives of the Center are: (1) to conduct original research in mass and public communication; (2) to disseminate research-generated information; and (3) to provide research services to faculty and students, professional communicators, and others interested in improving the quality of human communications.

Computing and Administrative Systems (Division of Information Infrastructure)
John Jarrard, Director
Faculty Associates:
Art: Prof. Susan Metros; Communications: Dr. M. Mark Miller; Computer Science: Dr. David Straight; Engineering: Dr. Osama Soliman; Forestry: Dr. Boyd L. Dearden; Human Ecology: Prof. Kurt Weiss; Instructional & Multimedia Technology: Dr. Patricia L. Fisher; Social Work: Dr. David A. Patterson; Statistics: Dr. James L. Schmidhammer; High-performance Computing/ Supercomputing: Dr. William E. Bliss

Computing and Administrative Systems (CAS), which is part of the UT Division of Information Infrastructure, provides computing facilities and services for the university’s teaching, research, public service, and administrative activities. CAS maintains a home page on the World-Wide Web at http://www.cas.utk.edu. CAS offices and principal computing facilities are located on the first two floors of Stokely Management Center (SMC), on the fourth and fifth floors of Dunford Hall, and on the first and P2 floors of Andy Holt Tower. Assistance with any computer-related question, including information about CAS services and facilities, is available by calling the CAS Help Desk at 974-8200.

The Computer Access for Education (CAFE) program provides UT students, faculty, and staff members the opportunity for computing experience through an individual CAS computer account. Student accounts for use in coursework are requested by the department through which the course is offered. Faculty and staff members can request a CAS account for research or administration by completing a request for computing services; forms are available from the receptionist at 200 SMC.

Free, non-credit courses on computer topics are taught throughout the year. Topics include Internet access, electronic mail, statistical programs, and word processing available at CAS. Videotapes covering mainframe and microcomputer topics are available for private viewing in Audiovisual Services at Hodges Library; the CAS/Hodges Library Micro Lab has available instructional tapes on microcomputer software. The free, non-credit computer courses are announced in the DII Newsletter, the CAS home page on the World-Wide Web, and in Tennessee This Week.

CAS maintains on-line and printed documents describing the availability and use of system hardware and software. The CAS UNIX Users Guide is available at the UT Book & Supply Store. The monthly DII Newsletter announces changes to systems, equipment, and procedures and contains other items of interest to users.

CAS is an affiliate of the following National Science Foundation Supercomputing centers: Pittsburgh Supercomputing Center, the National Center for Supercomputing Applications at the University of Illinois, and the Cornell National Supercomputer Facility. Consulting services are provided by CAS on those systems.

The UNIX operating system is available from CAS in the form of a Sun 4/690-51 running...
Energy, Environment, and Resources Center

(Office of Vice Chancellor for Research)

Jack N. Barkerbus, Director

The Energy, Environment, and Resources Center, 600 Henley Street, Suite 311, was created in 1973 to encourage interdisciplinary research directed at solutions to problems related to energy and the environment. The Center involves faculty and students in research and public service projects, manages research and development projects that involve several disciplines, and assists government and industry in specific problems related to energy, environmental, resource, and technology policy issues. The Center has a close working relationship with the Joint Institute for Energy and Environment, and Oak Ridge organizations. Sponsors include federal and state agencies, industry, and foundations.

Current research includes solid, hazardous, and radioactive waste management, information systems, environmental assessment, global environmental problems, and pollution prevention. The Center operates the Waste Management Research and Education Institute, the Center for Clean Products and Clean Technologies, and the Water Resource Research Center. Current grants and contracts are approximately nine million dollars per year.

English Language Institute

Dale A. Myers, Director

The English Language Institute (ELI) is a non-credit language-study program of The University of Tennessee, Knoxville. It is designed to assist students in their pursuit of career goals or educational objectives in the U.S.

The ELI offers intensive courses for the improvement of student skills in the English language. International students, visitors, and professionals have successfully learned English through study in the ELI.

The courses emphasize the development of communicative ability in listening, speaking, reading, and writing. Faculty members are trained to teach English to speakers of other languages with differing national backgrounds and varying proficiency in English.

Classes also assist students in pronunciation, test-taking strategies, U.S. culture orientation, and university study skills. Additional information may be obtained at 907 Mountcastle St., (423) 974-3404; FAX (423) 974-5832.

Institute of Agriculture

D. M. (Pete) Gosssett, Vice President

The Institute of Agriculture traces its history to 1869 when the University was designated as Tennessee’s Federal Land-Grant Institution. Under terms of the Federal Land-Grant Act, the University was enabled to offer instruction in agriculture and the mechanic arts for the first time. Since 1869, agricultural programs at the University have been expanded to include systematic method of gaining and applying new knowledge through research.

To assist in the research program, the Institute has a close working relationship with the Joint Institute for Energy and Environment, and Oak Ridge organizations. Sponsors include federal and state agencies, industry, and foundations.

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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.

Learning Research Center

(Office of Vice Chancellor for Research)

W. Lee Humphreys, Director

The Learning Research Center engages in research and facilitates the research of others into all aspects of learning and teaching in higher education. The Center also builds upon this research to support faculty and graduate students in course design and instructional activities.

A significant part of the Center's research activity is coordinated through a weekly research seminar open to all faculty and graduate students. The results of the Center's research are disseminated through a number of dissertations, publications and presentations, including the series "Teaching-Learning Issues" which is sent to all faculty at the University and to others in this country. The Center offers a range of support programs for instructors, including individual consultations about teaching, occasional workshops, the GTA Seminar, the GTA Consultation service, the SPEAK testing program for foreign GTAs, a lending library of publications on college teaching and learning, an orientation for new faculty, and a course registration evaluation program. Several of the Center's publications are designed to enhance instruction, including the GTA Newsletter and the New GTA Handbook. All of the Center's development activities are designed to improve instruction at UT, and individual consultations and evaluation services are confidential.

The Center is located in Suite 5, Hoskins Library.

Libraries, The University of Tennessee, Knoxville

Paule T. Kaufman, Dean
Aubrey H. Mitchell, Associate Dean

Professors:
Bayne, Pauline S., M.S.L.S. ....... North Carolina
Crawford, Mary Frances, M.S.L.S. ....... Kentucky
Felder-Hoehne, Felicia H., M.S.L.S. ....... Atlanta
Grady, Agnes M., M.Ln. ....... Washington
Kaufman, Paule T., M.S. ....... Columbia
Phillips, Linda L., M.LS. ....... Rutgers
Rader, Joe C., M.S.L.S. ....... Tennessee
Webster, Judith D., M.S.L.S. ....... Tennessee

Associate Professors:
Baker, Gayle D., M.L.S. ....... Alabama
Bridges, Anne E., M.L.S. ....... Rhode Island
Brittain, William A., M.S.L.S. ....... Clarion
Clement, Russell T., M.L.S. ....... Brigham Young
Courtis, Martin, M.A.L.S. ....... Wisconsin
Crowther, Karen N.T., M.Ln. ....... Emory
Dixon, Lana, M.S.L.S. ....... Tennessee
Goetsch, Lori, M.L.S. ....... Rosary
Harwood, Richard, M.L.S. ....... North Texas
Kim, Sook-Hyun, M.A.L.S. ....... Indiana
Leach, Sandra S., M.Ln. ....... Emory
Lloyd, James B., Ph.D. ....... Mississippi
Miller, Tamara J., M.S.L.S. ....... Kentucky
Minton, James O., M.S.L.S. ....... Tennessee
Mitchell, Aubrey H., M.S.L.S. ....... Tennessee
Row, Jane S., M.S.L.S. ....... Tennessee
Sammartino, Linda, M.L.S. ....... Southern Connecticut State
Smith, Rita H., M.S.L.S. ....... Illinois
Thompson-Wise, Deborah A., M.Ln. ....... South Carolina
Wallace, Alan, M.Ln. ....... Washington

Assistant Professors:
Brown, Melinda G. ....... North Carolina
Ellis, Kathryn C., M.S.L.S. ....... North Carolina
Garrett, Marie A., M.L.S. ....... Vanderbilt
Hammons, James W., M.L.S. ....... Indiana
Johnson, Kay G., M.L.S. ....... Pittsburgh
Kealy, Jillian M., M.L.S. ....... Tennessee
Lahman, Joan M., M.L.S. ....... Tennessee
Mack, Thura, M.L.S. ....... Tennessee
Martin, Michelle, M.L.S. ....... North Carolina
Ponnappe, Biddanda P., M.S.L.S. ....... Tennessee
Prescod, Janette, M.L.S. ....... Western Michigan
Shiode, Flora G., M.L.S. ....... Texas
Thomas, Deborah M., M.L.S. ....... Georgia
Thompson, Steve, M.L.S. ....... Tennessee
Viera, Ann R., M.L.I.S. ....... California (Berkeley)
Watkins, Norman B., M.L.S. ....... Tennessee
Wise, Flossie, M.L.S. ....... Tennessee

The University of Tennessee, Knoxville Libraries own* approximately two million volumes, more than 3.5 million manuscripts, 2 million microforms, 30,000 audio and video recordings, plus United States and United Nations documents. The UT Knoxville Libraries currently subscribe to more than 1,000 periodicals and other serial titles. The Libraries' membership includes many research and teaching communities. The Libraries maintain a comprehensive library of materials on a permanent basis.

The UT Knoxville Libraries consist of the main library (the John C. Hodges Library), four branches on the Knoxville campus (the Agriculture-Veterinary Medicine Library, the Cartographic Information Center, the Music Library, and the University Archives and Special Collections), and the Social Work Library in Nashville.

The John C. Hodges Main Library (1015 Volunteer Blvd.) is a 3.5 million-square-foot facility housing collections in all subject areas. The Hodges Library has approximately 300 graduate student carrels, 200 faculty studies, and comfortable study space for more than 2,000 people.

The Hodges Library's research holdings are augmented by Reference Services and Interlibrary Services. Reference Services provides research assistance and access to commercially available databases. Users may also search a number of CD-ROM databases.

Interlibrary Services borrows monographs and obtains copies of other material from libraries around the world, usually at no charge. Library holdings are accessible via a sophisticated online catalog which can be searched in the Hodges Library, the branch libraries, and from home and office computers. The Online Library Information System (OLIS) also provides access to a wide range of information resources available over the Internet.

The services and facilities of the University Libraries are accessible to persons with disabilities. Adaptive equipment such as a Kurzweil Personal Reader and TDD are available at the Hodges Library.

The Agriculture-Veterinary Medicine Library (Room A-113, Veterinary Teaching Hospital) has a strong collection in agriculture; veterinary, comparative and human medicine; and related biological sciences. It has a wide-ranging audiovisual collection and an extensive reference collection.

The Cartographic Information Center (Room 15, basement of the Hoskins Library, Cumberland Ave. 15th St.) contains a worldwide collection of over 350,000 maps covering all subjects. Maps are received from the U.S. Geological Survey, Defense Mapping Agency, and the National Ocean Survey. Maps, atlases, globes, and books relating to cartography may be borrowed for reference, research, and teaching.

The Music Library (301 Music Bldg.) has a comprehensive collection of music and music literature, including books, scores, audio and video recordings, current periodicals, and microfilm. All materials in the Library of Congress "M" classification are located here.

Special Collections (2nd floor, west wing, of the Hoskins Library) is a repository of regional and local materials, Tennesseans, and other specialties, including legislative papers and mementos of many Tennessee political figures. Special Collections materials are of particular interest to scholars in the fields of history, political science, social sciences, biological sciences, and the arts. The University Archives contains official records of the University; items published officially and unofficially by its units, departments, and agencies; and other materials that document University of Tennessee life.

The Social Work Library (1720 West End Ave.) serves College of Social Work students in field practice across the state. The library has a working collection of materials in social work and related disciplines.

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

*Data excludes Law Library faculty and statistics.

Maintenance and Reliability Center

(College of Engineering)

The Maintenance and Reliability Center (MRC), located in 212 Pasqua Hall, was created in 1986 to provide an interdisciplinary center for research, development and application of advanced maintenance and reliability engineering. MRC's primary goal is to provide productiv-
ity improvements to industry by advances in failure prevention technology. Associated with this effort is the establishment of maintenance and reliability engineering as an interdisciplinary activity with application across a broad spectrum of industrial activities. In addition, MRC stresses the development of management techniques that will provide decision makers with the means to assess the availability, costs and benefits of failure prevention techniques.

MRC is an association consisting of industrial members and the University of Tennessee College of Engineering. Interested and qualified students may affiliate with the MRC program while pursuing a degree in an engineering department. Maintenance engineering courses are available as electives for these students. Research opportunities and graduate assistantships are also available for qualified students.

Center sponsored research projects are focused on life prediction technology, information processing technology, sensors, measurement systems and automation, and maintenance design engineering. Other research focus areas will be developed as the needs of industrial members are identified and matched with areas of university expertise.

Management Development Center

(University of Tennessee)

John E. Riblett, Director

The College of Business Administration's executive/management education efforts are facilitated through the Management Development Center, 708 Stokely Management Center. The mission of the Center is to promote the learning and dissemination of an integrated framework of managerial excellence. The Center defines excellence terms of competitive world standards of quality, efficiency, and service to the recognized concerns of all constituencies (customers, employees, suppliers, owners, students, and society in general). This mission includes the accepted responsibility for (1) developing close strategic partnerships with a selected set of companies to better facilitate learning and development of the knowledge which is truly externally valued, and (2) acting as a facilitator in driving this knowledge into the credit curriculum of the College. The Center prides itself on the development of long-term relationships with organizations that provide a living laboratory to test and validate the new knowledge of the Center that is disseminated in a variety of formats. Executive and Management Education Programs are one form of dissemination. A staff of 20 designs, develops, and markets fifty yearly offerings for over 1000 participants. The Center emphasizes consistent, high-quality programming, small class sizes, outstanding faculty who bring the added value of years of experience in the private and public sectors to the classroom, a highly interactive style of instruction, and an applied orientation. The focus is on longer term, more developmentally oriented programs of one to four weeks in length such as the four-week University of Tennessee Executive Program and one-week Senior Executive Institute for Productivity Through Quality.

Measurement and Control Engineering Center

(College of Engineering)

Arlene Garrison, Director

The Measurement and Control Engineering Center, 102 Estabrook Hall, is sponsored by the College of Engineering, the Instrumentation and Controls Division of Oak Ridge National Laboratory, and the National Science Foundation. The Center's program combines education, research, and technology transfer. Graduate assistantships are available for qualified students. The research is funded by major U.S. industrial companies and focuses on theoretical and practical developments in measurement and control, concentrating on areas that will significantly improve the productivity, reliability and safety of industrial systems and processes.

Center sponsored research is carried out in the fields of process control, sensor and image processing, and sensor development. Research in process control concentrates in the areas of process analysis, process modeling, control system design, and real-time expert systems. Fiber optic sensor systems development is underway for monitoring and control of chemical processes.

Network Services

(Division of Information Infrastructure)

Network Services (NS) provides network connectivity throughout the UTK campus, data communications between the UT campuses and connectivity to the Internet. The UTK network consists of over 6,000 nodes and is growing at 20% per year. Network connectivity is being extended to the dorms and should be widely available in the near future. NS also provides dial-up access to the campus network via a 300 modem dial-up pool. This pool supports PPP that allows users to connect to the Internet as well as file servers on campus. In addition to the analog radios provided, NS provides high-speed, digital connections via ISDN. For further information on Network Services, please consult our web page (www.ns.utk.edu) or call (423) 974-8616.

Nutrition Institute

(College of Human Ecology)

Dileep Sachan, Director

The Nutrition Institute is a system wide, multidisciplinary consortium of faculty who are engaged in clinical and experimental nutrition research, teaching and service. Its expertise and resources are multifaceted including tools and techniques used in cell biology, epidemiology, metabolism and clinical training.

The multidisciplinary nature of nutrition has created a situation where nutrition research and teaching is dispersed among a number of academic units, including the Department of Nutrition in the College of Human Ecology as well as in several departments in the colleges of Agricultural Sciences, Arts and Sciences, Medicine, and Veterinary Medicine. The Institute provides a communication link among all efforts in nutrition sciences, coordinates collaborative research programs in nutrition and provides a unified forum for exchange and interactions with the national and international nutrition community. In addition, by creating formal ties among the units within the University that are involved in undergraduate, graduate and professional education in nutrition, teaching resources may be pooled to strengthen nutrition-related instruction in these units.

Oak Ridge Associated Universities

Since 1946, students and faculty of The University of Tennessee have benefited from its membership in Oak Ridge Associated Universities (ORAU), a consortium of colleges and universities and a management and operating contractor for the U.S. Department of Energy (DOE) located in Oak Ridge, Tennessee. ORAU works with its member institutions to help them and faculty gain access to federal research facilities throughout the country; to keep its members informed about opportunities for fellowship, scholarship, and research appointments; and to organize research alliances among its members.

Through the Oak Ridge Institute for Science and Education (ORISE), the DOE facility that ORAU manages, undergraduates, graduates, postgraduates, as well as faculty enjoy access to a multitude of opportunities for study and research. Students can participate in programs covering a wide variety of disciplines including business, earth sciences, engineering, physics, pharmacology, ocean sciences, biomedical sciences, nuclear chemistry, and mathematics. Appointment and program length range from one month to four years. Many of these programs are especially designed to increase the numbers of underrepresented minority students pursuing degrees in science- and engineering-related disciplines. A comprehensive listing of these programs and other opportunities, their disciplines, and details on locations and benefits can be found in the Resource Guide which is available by calling the contacts below.

ORAU's Office of Members Service seeks opportunities for collaborative research and development alliances among its members, private industry, and major federal facilities. Current alliances include the Southern Association for High Energy Physics, the Bioelectromagnetics Research Consortium, High Performance Computing, Bioprocessing, Pan American Association for Physics, Materials Science Forum, and international initiatives in support of the New Independent States in Central and Eastern Europe. Other UIGA activities include the sponsorship of conferences and workshops, the Visiting Scholars program, and the Junior Faculty enhancement Awards. A copy of Especially for Members, which details UIGA's programs, is available from the contacts below.

For more information about ORAU and its programs, contact Dr. Michael D. Devine, ORAU Council member at 423-974-3466; or contact Monnie E. Champion, ORAU Corporate Secretary, at 423-576-3306.
Off-Campus Graduate Centers

KINGSPORT GRADUATE PROGRAM

UT Knoxville offers graduate programs in engineering and Human Resource Development at the Master’s level. Students who enroll in these programs must be admitted to The Graduate School of UT Knoxville. Information and application forms may be obtained from the ETSU/UT at Kingsport, 1050 University Boulevard, Kingsport, Tennessee 37660.

OAK RIDGE GRADUATE PROGRAM

UT Knoxville offers graduate programs at Oak Ridge leading to Master’s and doctoral degrees in engineering and supporting areas. Courses are given in the evenings with research facilities provided by and used in cooperation with the Oak Ridge Associated Universities (ORAU). Students can earn a Master’s degree in Environmental Engineering, Nuclear Engineering (radiological engineering concentration), Industrial Engineering (engineering management concentration), Chemical Engineering, or Electrical Engineering. Additional upper division and graduate courses are offered in mathematics, statistics, safety, physics, human resource development, and other engineering areas.

This program is supported under a sub-contract with ORAU with principal support coming from the Lockheed Martin Corporation. UT is one of the sixty-two colleges and universities which sponsor ORAU, a nonprofit education and research management corporation.

Students who enroll in these programs must be admitted to The Graduate School at UT Knoxville. Information and application forms may be obtained from the UT-Oak Ridge Graduate Program, Post Office Box 117, TMSD Lab Road, Oak Ridge, Tennessee 37831-0117.

NASHVILLE ENGINEERING GRADUATE PROGRAM

UT Knoxville offers graduate programs leading to the Master of Science with majors in Civil Engineering, Industrial Engineering, and other disciplines, as the need and resources permit.

Students who enroll in these programs must be admitted to The Graduate School of UT Knoxville. Information and application forms may be obtained from the Nashville Engineering Graduate Program, 1720 West End Avenue, Suite 401, Nashville, Tennessee 37203.

CHATTANOOGA EDUCATION PROGRAM

UT Knoxville offers a graduate program in education leading to the Specialist in Education and the Doctor of Education degrees with a major in Leadership Studies in Education. Students who enroll in this program must be admitted to The Graduate School of UT Knoxville. Information and application forms may be obtained from the UT/UTC Graduate Center, UTC, 120 Race Hall, Chattanooga, Tennessee 37403.

THE UNIVERSITY OF TENNESSEE-OAK RIDGE GRADUATE SCHOOL OF BIOMEDICAL SCIENCES

UT Knoxville offers a program leading to the M.S. and Ph.D. degrees with a major in Biomedical Sciences. Graduate students have the opportunity to study and do research in conjunction with the Biology Division of the Oak Ridge National Laboratory.

For complete information concerning the program, see Biomedical Sciences under Fields of Instruction.

COLLEGE OF SOCIAL WORK

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

The UT Knoxville College of Social Work also offers a Doctor of Philosophy with a major in Social Work.

For complete information concerning the programs, see Social Work under Fields of Instruction.

Psychological Clinic

(College of Liberal Arts)

Leonard Handler, Director

The Psychological Clinic supports graduate research and training in clinical psychology. Psychological assessment and psychotherapy are offered on an outpatient basis to the general public as well as to University students and staff.

Statistical Consulting Center

The goal of the Statistical Consulting Center (SCC) is to help students, faculty and staff enhance the quality of their research by working together to effectively apply statistical methodology. SCC is co-sponsored by the Computing and Administrative Systems (CAS) of the Division of Information and Infrastructure and the Department of Statistics.

Services offered are assistance in design of study; management of data; analysis and interpretation of results; aid in choice and creation of the most effective statistical graphics; review of journal articles, grant proposal, thesis or dissertation; writing of programs using statistical packages; teaching short courses on how to use statistical software.

There are five full-time Master’s level statisticians, two half-time graduate research assistants, and a quarter-time faculty associate with the Department of Statistics. In addition, access is provided to faculty consultants. A CAS account can provide access to many popular computers and statistics packages. Software is also available for use on personal computers through various site-licensing agreements.

Contact the Computing Help Desk, at 974-8200 and ask to speak to a statistical consultant. Charges for our services are billed through a CAS account project code. Consultants are located at 200 Stokely Management Center.

Textiles and Nonwovens Development Center

(College of Human Ecology)

Larry C. Wadsworth, Director

The Textiles and Nonwovens Development Center (TANDEC) was officially dedicated in October 1980. TANDEC was made possible through a grant from Exxon Chemical Company.

Nonwovens products loom large in a number of markets and TANDEC looms large in both basic research and nonwovens product development. Nonwovens research programs at UT Knoxville include structure-property-process relationships in man-made polyolefins, polyesters, nylon, elastomeric polymer, engineering thermoplastics and recycled plastics; mechanism of melt blown web formation; modeling of the melt blowing and spunbonding processes; development of on-line optical measurements for control of the critical properties of melt blown webs; electrical measurement of fiber alignment and bonding in nonwovens webs; thermal bonding and characterization of cotton/synthetic fiber nonwovens; computational analysis of heat transfer behavior in thermal calendaring; study of protective apparel for agricultural, industrial and medical uses; and finishing of nonwovens. In addition to the basic research, technology transfer has been accomplished during the past several years by assisting companies in applied projects, primarily in the melt blowing area.

The primary missions of TANDEC are to conduct nonwoven and textile grant research programs and to develop new product applications. The TANDEC facilities further allow production of nonwovens on a limited basis for participating companies while equipment is not being used for research activities. The nonwovens laboratory hosts numerous guests from industry and academic, and the facilities are planned to meet their needs, while safeguarding research confidentiality.

Transportation Center

(Office of Vice Chancellor for Research)

Stephen H. Richards, Director

The Transportation Center was created in 1970 to foster and facilitate interdisciplinary research and public service in the field of transportation at The University of Tennessee. It began operating full-time in 1972 and since then has contributed greatly to the overall research program of The University.

The Center, 600 Henley St., Suite 309, is a University-level organization administratively positioned within the Office of the Vice Chancellor for Research at UT Knoxville. The Center’s multidisciplinary staff includes over 100 full-time researchers and technicians augmented with numerous faculty and students. The Center is presently organized into four major divisions: Logistics and Systems Analysis; Infrastructure and Environment; Safety and Traffic Operations; and Mobility Services and Frosty.

The Center has three goals. The first is to conduct a program of research in transportation that is recognized for its excellence, comprehensiveness, innovation, productivity, and national leadership. The second is to develop and sustain the technical expertise for high
quality transportation research by the faculty and students within the various departments and colleges of UT. The third goal is to serve the transportation research, service, and training needs of state and local government, business, and industry in Tennessee, the southeast region, and the nation.

University Evening School
(Office of Vice Chancellor for Academic Affairs)

Dr. John Muldowny, Associate Dean and Director of Summer, Evening and Special Programs

The University Evening School, in conjunction with academic colleges and departments, administers credit programs for those students attending classes on and off campus in a variety of nontraditional formats. Support services are provided to assist students in their educational pursuits.

ON CAMPUS EVENING PROGRAM

Courses are offered during late afternoon and evening hours for those students who work or have other commitments during the day. The College of Communications offers the M.S. degree program in the evening. The School of Information Sciences offers the M.S. degree program which can be completed by attending evenings and summer session. The College of Arts and Sciences offers the Master's program in Public Administration. Some departments within the Colleges of Agricultural Sciences and Natural Resources, Business Administration, Education, and Engineering offer all courses required for an advanced degree during the evening. For a specific major, consult the appropriate department.

MINI-TERM

The University Evening School offers a Mini-Term during May. Students may enroll in one concentrated credit course during the Mini-Term period.

Courses and instructors listed for the Mini-Term are carefully selected to reflect a broad academic base of individualized offerings suited to an intensive program of study. Courses cover material and information included in regular semester offerings.

OFF CAMPUS PROGRAMS

The Evening School makes arrangements for departments to conduct undergraduate and graduate courses in many locations away from the Knoxville campus. The courses are scheduled in response to requests and identifiable needs of adult part-time students who live some distance from the UT Knoxville location. All course offerings and instructors are approved by the appropriate academic departments, and the credit awarded is resident credit.

The following graduate programs are available: Doctor of Education and Specialist in Education with a major in Leadership Studies in Education (Chattanooga); Master of Science with a major in Human Resource Development (Statewide).

The Evening School administers an off-campus center at Oak Ridge where courses leading to advanced degrees in science and engineering are offered (see listing under Off-Campus Graduate Centers).

WORKSHOPS

Credit workshops are coordinated through various academic departments of the University and give students the opportunity to participate in short periods of intensive study.

Workshops offer flexibility of timing, location, and content. Summer workshops are particularly popular with teachers and school administrators. Although most workshops are held on the UT Knoxville campus, geography is not a limiting factor.

STUDENT SERVICES

A comprehensive program of services including academic advising and financial aid information is provided by the University Evening School for both on and off campus students.

REGISTRATION

Registration by touchtone phone, mail, FAX, or regular phone is offered as a convenience to former Evening School students. Final registration at both on and off campus locations is also available.

For information, contact the UT Evening School, 451 Communication Bldg., University of Tennessee, Knoxville, TN 37996-2341, or telephone (423) 974-5361 or 1-800-876-8657, FAX (423) 974-2027; email: uteveningschool@gateway.oe.utk.edu.

University of Tennessee Space Institute

T. Dwayne McCoy, Vice President

The Space Institute is a graduate education and research institution located on a 365 acre lakeshore campus in Middle Tennessee. UTSI was established in 1964 and has evolved into an internationally recognized institution for graduate study and research in engineering, physics, mathematics, and computer science. The accredited academic programs and educational policies of the Space Institute have their origins in appropriate departments of The University of Tennessee, Knoxville. The more than 40 faculty members of the Institute carry out these sponsored academic programs through classroom teaching, informal seminars, active research, and directing the research of their students in an environment of creative work and advanced study. Programs are available to students devoting full-time or part-time effort toward M.S. and Ph.D. degrees, those interested in continuing education for updating and broadening knowledge, and those who wish to pursue post-doctoral research.

Graduate degree programs are available with majors in Aerospace Engineering, Aviation Systems, Chemical Engineering, Computer Science, Electrical Engineering, Engineering Science, Industrial Engineering (engineering management concentration), Mathematics, Mechanical Engineering, Metallurgical Engineering, and Physics. In addition to the fundamental studies characteristic of each discipline, research opportunities are available in many areas including aerodynamics, fluid mechanics, advanced space propulsion, neural networks, energy conversion processes, superconducting materials, thermal sciences, coal combustion, magnetohydrodynamics, plasma physics, space systems, propulsion, computational fluid dynamics, and other aspects of atmospheric and space flight.

The Institute has an established Center of Excellence in Laser Applications and offers graduate studies and research opportunities in laser diagnostics, laser materials interactions, pico-second processes, and coherent and nonlinear optics.

The Institute was established in part to increase the research and engineering resources of Tennessee through education and practice in relevant scientific and technical areas and in part to interface University faculty and student research with the Air Force Arnold Engineering Development Center. The faculty, research activities, and facilities of the Institute, and those available at Arnold Center through appropriate contractual arrangements, provide students an unusual opportunity for significant research in these areas. Students who enroll at UTSI are admitted to The Graduate School, The University of Tennessee, Knoxville. Graduate Research Assistantships are available for qualified students. Further information may be obtained from the Dean for Academic Affairs, The University of Tennessee Space Institute, Tullahoma, Tennessee 37388.

Water Resources Research Center
(Office of Vice Chancellor for Research)

Timothy R. Gangaware, Associate Director
The Water Resources Research Center, 600 Henley Street, Suite 311, is a federally designated institute for sponsoring and coordinating water research for the state. The purposes of the Center are: (1) to assist and support all the academic institutions of the state, public and private, in pursuing water resources research which addresses a wide range of problems of interest to the state, region, and nation; (2) to provide for information dissemination and technology transfer services to state and local government bodies, academic institutions, professional groups, environmental organizations, and others, including the general public, who have an interest in water resources matters; (3) to promote education and training in fields relating to water resources and to encourage the entry of promising students into careers in these fields. The Center maintains a technical library which includes numerous water resources-related databases on CD-ROM.
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