### Student Calendar For 1976

#### Winter Quarter, 1976
- **January 5-6 (Monday-Tuesday)**: Registration
- **January 7 (Wednesday)**: Classes Begin
- **February 10 (Tuesday)**: Change of Registration Deadline
- **March 16 (Tuesday)**: Classes End
- **March 19 (Friday)**: Commencement

#### Spring Quarter, 1976
- **March 25-26 (Thursday-Friday)**: Registration
- **March 29 (Monday)**: Classes Begin
- **April 16-17 (Friday-Saturday)**: Easter
- **March 19 (Friday)**: Change of Registration Deadline
- **June 8 (Monday)**: Classes End
- **June 11 (Friday)**: Commencement

#### Summer Quarter, 1976
- **June 21-22 (Monday-Tuesday)**: Registration, First or Both Terms
- **June 23 (Wednesday)**: Classes Begin
- **July 5 (Monday)**: Independence Day (No Classes)
- **July 9 (Friday)**: Change of Registration Deadline, First Term
- **July 21 (Wednesday)**: Classes End, First Term
- **July 22 (Thursday)**: Registration, Second Term
- **July 23 (Friday)**: Classes Begin, Second Term
- **July 27 (Tuesday)**: Change of Registration Deadline, Twelve Week Term
- **August 9 (Monday)**: Change of Registration Deadline, Second Term
- **August 19 (Thursday)**: Classes End
- **August 23 (Monday)**: Commencement

#### Fall Quarter, 1976
- **September 20-22 (Monday-Wednesday)**: Registration
- **September 23 (Thursday)**: Classes Begin
- **October 27 (Wednesday)**: Change of Registration Deadline
- **October 29 (Friday)**: East. Tenn. Educ. Assoc. (No Classes)
- **November 13 (Saturday)**: Homecoming (No Classes)
- **November 25-27 (Thursday-Saturday)**: Thanksgiving (No Classes)
- **December 7 (Tuesday)**: Classes End
- **December 10 (Friday)**: Commencement
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Correspondence Directory

Graduate Study
Dr. Hilton A. Smith, Vice Chancellor
for Graduate Studies and Research
Margaret N. Perry, Dean for Graduate
Studies
Diana C. Lopez, Assistant Director of
Graduate Admissions

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Head of Department in which you plan
to major

Loans
Work Study
Part-Time Employment
Student Loans
Carolyn Cuddy, Director, Financial
Aids, 301 Student Services Bldg.

Housing
Married students—Office of Rental
Properties, Stadium
Single students—Office of Residence
Halls, 405 Student Services Bldg.

International Student Advisor
Alumni Hall

Scholarships and Fellowships
Sean Van Pallandt, The Graduate
School

Thesis Consultant
Georgia Bunn, The Graduate School

Timetable of Classes
Supervisor of Registration,
Registrar's Office

Transcripts
Bob L. Cochran, Registrar
The University of Tennessee, Knoxville

MAIN CAMPUS:
1 Ayres Hall
2 South College
3 Dabney Hall & Buehler Hall
4 UTK Personnel Office
4A UTK Employment Office
5 Geology and Geography Bldg.
6 Physics Building
7 Holser Biology Building
8 Austin Peay Bldg.
9 Turner House
10 Alumni Memorial Auditorium—Gymnasium
11 Neyland Stadium
12 Berry Hall
13 Estabrook Hall
14 Blount Hall
15 Perkins Hall
16 Ferris Hall
17 Dougherty Engineering Bldg.
18 White Avenue Building
19 Nursery School
20 Family Life Center
21 Harris Home Economics Bldg.
22 Psychological Service Center
23 Hodges Library (Main Library)
24 Estes Kefauver Memorial Wing
25 Craft House
26 Planning School Annex
27 Taylor Law Center
28 Planning School
29 Panhellenic Building
30 Alumni Hall
31 Temple Court
32 Student Affairs Building
33 Carolyn P. Brown Memorial University Center
34 Student Clinic & Hospital
35 UT Credit Union
36 School of Social Work
37 Glocker Business Administration Building
38 Andrew Holt Tower
39 Claxton Education Building
40 Hearing and Speech Center
41 Communications and University Extension Building
42 Student Services and Administration Building
43 Andrew Holt Tower Parking Garage
44 McClung Museum
45 Humanities Complex/McClung Tower
46 John C. Hodges Undergraduate Library
47 Art Center
48 Dunford Hall
49 Greve Hall
50 Henson Hall
51 Pedestrian Overpass
52 Strong Hall—University Cafeteria
53 Clement Hall
54 Design House
55 Massey Hall
56 Religious Center(s)
57 Kappa Sigma
58 History Annex
59 Melrose Hall
60 Hess Hall
61 Clarence Brown Proscenium Theatre
62 Carousel Theatre
63 Gibbs Hall
64 Power Plant
65 Army Reserve Training Center
66 William S. Stokely Athletics Center
67 Music Building
68 University Architect's Office
69 Physical Education Building
70 Tom Black Track & Recreation Area
71 Phi Sigma Kappa
72 Kappa Alpha
73 Sigma Alpha Epsilon
74 Alpha Tau Omega
75 Sigma Chi
76 Pi Kappa Alpha
77 Sigma Nu
78 Phi Kappa Phi
79 Sigma Phi Epsilon
80 Phi Gamma Delta
81 Alpha Gamma Rho
82 Delta Tau Delta
83 Lambda Chi Alpha
84 Physical Plant
85 Motor Pool
86 Safety and Security
87 Purchasing Agent
88 Student Aquatic Center
89 Morrill Hall
90 Humes Hall
91 Presidential Court Building
92 Reese Hall
93 Carrick Hall
94 Apartment Residence Hall
95 Grounds Department
96 Briar Eisele House (Economics Research)
97 Fine Arts Buildings
98 Nuclear Engineering Building
99 Physical Plant (Sheet Metal Shop) and Ecology Department
100 Arts & Crafts House
101 Safety Building
102 East Tenn. Development District
103 Southern Regional Media Center for Deaf-1814 Lake Ave.
104 Reading Center
105 Tennessee Research Co-ordination Unit
106 Technical Assistance Center
107 U-T Learning Center
108 Music Annex & Personnel Annex
109 Rehabilitation Counselor Education
110 Omega Psi Phi
111 Acacia
112 Alpha Kappa Lambda
113 Alpha Epsilon Pi
114 Phi Delta Theta
115 Phi Kappa Psi
116 Phi Kappa Tau
117 Chi Phi
118 Delta Upsilon
119 Beta Theta Pi
120 Farmhouse

Agricultural Campus

"The Hill"
AGRICULTURAL CAMPUS:
201 Morgan Hall
202 Greenhouse
203 Power Plant
204 Old Agricultural Engineering Bldg.
205 Agricultural Engineering Bldg.
206 Agricultural Engineering Lab.
207 Plot Barn
208 Tenn. State Division of Forestry
209 Fiber Lab.
210 Spinning Lab.
211 Entomology-Plant Pathology Bldgs.
212 Ellington Hall-Plant Sciences
213 C. E. Brehm Animal Sciences Bldg.
214 McLeod Food Technology Building
215 Dairy Products Building
216 Corn-Cotton Building
217 McCord Hall
218 College Greenhouse

Main Campus

Graduate Office
115 Student Services Building

Bus Stops
Graduate School Office Hours

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

The Graduate School Administration
Hilton A. Smith, A.B., A.M., Ph.D., Vice Chancellor for Graduate Studies and Research
Margaret N. Perry, B.S., M.S., Ph.D., Dean for Graduate Studies
Carl O. Thomas, Dean for Research
William M. Konner, B.A., M.A., Ed.D., Administrative Assistant
Ben Granger, B.A., M.S.W., M.P.A., Ph.D., Dean, School of Social Work
Charles H. Weaver, B.S., M.S., Ph.D., Dean, UT Space Institute
Robert Lyle Young, B.S., M.S., Ph.D., Associate Dean for Educational Program, UT Space Institute
Lawrence K. Akers, B.A., M.S., Ph.D., Director, Oak Ridge Resident Graduate Program
Marvin Goodman, B.S., M.S., Director, Kingsport Graduate Program
Alexander Hollaender, A.B., A.M., Ph.D., Director of Archival Center for Radiation Biology and Special Assistant for Life Sciences
James A. Spencer, B.A., M.C.P., Director, Graduate School of Planning
Dan Billen, A.B., Ph.D., Director, UT-Oak Ridge Graduate School of Biomedical-Sciences
Floyd C. Larson, C.E., M.S., P.E., Director, Water Resources Research Center
Lynn Russell, Ph.D., Director, Chattanooga Graduate Engineering Program
Kenneth W. Heathington, B.S., M.S., Ph.D., Director of Transportation Center
John H. Gibbons, B.S., Ph.D., Director of Environmental Center

The Graduate Council
Membership January 1, 1976

Ex Officio Members
Vice Chancellor, Hilton A. Smith
Dean, Margaret N. Perry

College or Unit                  Elected Members         Date of Expiration       Proxy
---                               ---                      ---                       ---
Col. of Agriculture              Dr. W. W. Overcast       Dec. 31, 1977            Dr. Gary Lessman
Col. of Bus. Admin.              Dr. Robert McLean        Dec. 31, 1976            Dr. Bradley Schweiger
Col. of Communications          Dr. Jerry Lynn            Dec. 31, 1976            Dr. Kelly Leiter
Col. of Education               Dr. Robert Kirk          Dec. 31, 1977            Dr. Robert Howard
                                Dr. John R. Ray         Dec. 31, 1977            Dr. Henry J. Montoye
                                Dr. Jerry J. Bellon      Dec. 31, 1976            Dr. Eugene W. Schoch
                                Dr. Larry W. Hughes      Dec. 31, 1976            Dr. Robert L. Williams
                                Dr. Charles H. Ball       Dec. 31, 1978            Dr. Peter M. Husen
                                Dr. William H. Coffield   Dec. 31, 1978            Dr. Martha Peters
                                Dr. B. Dan Marks         Dec. 31, 1978            Dr. Bruce R. Dewey
                                Dr. Charles J. Noel       Dec. 31, 1977            Dr. Gayce Goertz
                                Dr. Robert J. Daverman    Dec. 31, 1978            Dr. Robert T. Gregory
                                Dr. B. J. Leggett         Dec. 31, 1978            Dr. Arthur G. Haas
                                Dr. D. A. Shirley         Dec. 31, 1976            Dr. Robert L. Hiller
                                Dr. Milton Klein          Dec. 31, 1976            Dr. Suzanne B. Kurth
                                Dr. James Tanner          Dec. 31, 1977            Dr. Edward H. Zambara
Col. of Engineering             Dr. John Devine          Apr. 31, 1976             Ms. Korin Gustafson
Col. of Home Economics          Ms. Elizabeth            Apr. 31, 1976             Ms. Ann Wachter
Col. of Liberal Arts            Christy Hughes            Apr. 31, 1976             Dr. Lloyd Crawford
Graduate Student Council        Dr. Gideon W. Fryer       Dec. 31, 1977
School of Social Work           Dr. James Wu              Dec. 31, 1976
UT Space Institute
Regulations Subject To Change

Any and all course offerings, academic requirements and other information contained in this publication are subject to change and/or revocation without notice. Anyone interested in the precise course offering, academic requirement at a given time, or who desires other special information should make inquiry in advance.
The University Of Tennessee

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

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E. S. Bevins, Jr., Concord
Leonard Raulston, Lookout Mountain
William M. Johnson, Sparta
Amon Carter Evans, Nashville

From Anderson, Bedford, Coffee, Franklin, Lincoln, Moore, and Warren Counties
TERM EXPIRES
Don O. Shadow June 1, 1979

From Davidson County
Mrs. Elaine McReynolds June 1, 1984

From Hamilton County
Paul J. Kinser June 1, 1978

From Knox County
Mrs. Ann Baker Furrow June 1, 1980
Frank P. Bowyer June 1, 1980

From Shelby County
Harry W. Laughlin July 1, 1981
Marcus J. Stewart July 1, 1981

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John Prados, B.S., M.S., Ph.D., Vice President for Academic Affairs
James E. Drinnon, B.S., J.D., Ed.D., Vice President for Administration
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T. Albert Farmer, B.S., M.D., Vice President for Health Affairs
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Charles Smith, Vice President for Public Service
Beauchamp Brogan, General Counsel, Secretary of Board of Trustees
Andrew J. Kozar, Executive Assistant to the President
Brodie Baynes, B.S., C.P.A., Treasurer

UT Knoxville Administration
Jack E. Reese, A.B., A.M., Ph.D., Chancellor
Luke Ebersole, B.D., A.M., Ph.D., Vice Chancellor for Planning and Administration
Walter R. Herndon, B.S., M.S., Ph.D., Vice Chancellor for Academic Affairs
Hilton A. Smith, A.B., A.M., Ph.D., Vice Chancellor for Graduate Studies and Research
Stanford Bohne, B.A., B.S., M.S., Vice Chancellor for Business and Finance
Howard F. Aldmon, B.S., A.M., Ed.D., Vice Chancellor for Student Affairs
Margaret N. Perry, B.S., M.S., Ph.D., Dean for Graduate Studies
O. Glen Hall, B.S., M.S., Ph.D., Dean of the College of Agriculture
Donald D. Hanson, B.Arch., M.Arch., Dean of the School of Architecture
John B. Ross, B.S., M.B.A., Ph.D., Dean of the College of Business Administration
Donald G. Hileman, B.S., M.S., Ph.D., Dean of the College of Engineering
Lura Mae Oland, B.S., M.S., Ph.D., Dean of the College of Home Economics
Kenneth L. Penegar, A.B., J.D., LL.M., Dean of the College of Law
Alvin Herborg Nielsen, A.B., M.S., Ph.D., Dean of the College of Liberal Arts
Joseph P. Goddard, B.S., M.S., Ed.D., Dean of the Division of Continuing Education
John J. McDow, B.S., M.S., Ph.D., Dean of Admissions (Undergraduate) and Records
Carl O. Thomas, Dean for Research

From Weakley County
TERM EXPIRES
Wayne Fisher July 1, 1981

Student Member
Emmett Edwards

Officers of the Board
Governor Ray Blanton, Chairman
Tom Elam, Vice Chairman
Edward J. Boling, President
Brodie Baynes, Treasurer
Beauchamp Brogan, Secretary
Katherine S. Jacobs, Assistant Secretary
### Majors and Degrees Available

<table>
<thead>
<tr>
<th>College of Agriculture</th>
<th>DEGREE</th>
<th>ADMISSION TEST REQUIRED</th>
<th>LETTERS OF RECOMMENDATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Biology</td>
<td>M.S.</td>
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<tr>
<td>Agricultural Economics</td>
<td>M.S., Ph.D.</td>
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<tr>
<td>Agricultural Engineering</td>
<td>M.S., Ph.D.</td>
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<tr>
<td>Agricultural Extension</td>
<td>M.S.</td>
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<tr>
<td>Agricultural Mechanization</td>
<td>M.S.</td>
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<tr>
<td>Animal Science</td>
<td>M.S., Ph.D.</td>
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<tr>
<td>Food Technology</td>
<td>M.S.</td>
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<tr>
<td>Forestry</td>
<td>M.S.</td>
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<tr>
<td>Ornamental Horticulture and Landscape Design</td>
<td>M.S.</td>
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<tr>
<td>Plant and Soil Science</td>
<td>M.S., Ph.D.</td>
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<tr>
<td>Wildlife and Fisheries Science</td>
<td>M.S.</td>
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<table>
<thead>
<tr>
<th>College of Business Administration</th>
<th>DEGREE</th>
<th>ADMISSION TEST REQUIRED</th>
<th>LETTERS OF RECOMMENDATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting</td>
<td>M.B.A., D.B.A.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Economics</td>
<td>M.A.C.T., M.A.</td>
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<tr>
<td>Finance</td>
<td>M.B.A., M.S., Ph.D.</td>
<td>X, X</td>
<td>or X</td>
</tr>
<tr>
<td>Governmental Financial Administration</td>
<td>M.B.A.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>* Industrial Management</td>
<td>M.B.A.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Management</td>
<td>D.B.A.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Management Science</td>
<td>M.S., M.B.A., Ph.D.</td>
<td>X</td>
<td>or X</td>
</tr>
<tr>
<td>Marketing</td>
<td>M.B.A., D.B.A.</td>
<td>X</td>
<td></td>
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<tr>
<td>Real Estate &amp; Urban Development</td>
<td>M.B.A.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>* Statistics</td>
<td>M.S., M.B.A.</td>
<td>X</td>
<td>or X</td>
</tr>
<tr>
<td>Transportation and Logistics</td>
<td>M.B.A., D.B.A.</td>
<td>X</td>
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<table>
<thead>
<tr>
<th>College of Communications</th>
<th>DEGREE</th>
<th>ADMISSION TEST REQUIRED</th>
<th>LETTERS OF RECOMMENDATION</th>
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<tbody>
<tr>
<td>Communications</td>
<td>M.S., Ph.D.</td>
<td>X</td>
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<table>
<thead>
<tr>
<th>College of Education</th>
<th>DEGREE</th>
<th>ADMISSION TEST REQUIRED</th>
<th>LETTERS OF RECOMMENDATION</th>
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</thead>
<tbody>
<tr>
<td>Adult Education</td>
<td>M.S.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Agricultural Education</td>
<td>M.S.</td>
<td>X</td>
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<tr>
<td>Art Education</td>
<td>M.S.</td>
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<tr>
<td>Business Education</td>
<td>M.S.</td>
<td>X</td>
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<tr>
<td>College Student Personnel</td>
<td>M.S.</td>
<td>X</td>
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</tr>
<tr>
<td>Curriculum and Instruction</td>
<td>ED.S., ED.D.</td>
<td>X</td>
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<tr>
<td>Distributive Education</td>
<td>M.S.</td>
<td>X</td>
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<tr>
<td>Educational Administration and Supervision</td>
<td>ED.D.</td>
<td>X</td>
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<tr>
<td>Educational Psychology</td>
<td>M.S.</td>
<td>X</td>
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<tr>
<td>Educational Psychology and Guidance</td>
<td>ED.S., ED.D.</td>
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<tr>
<td>Elementary Education</td>
<td>M.S.</td>
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<tr>
<td>English Education</td>
<td>M.S.</td>
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<tr>
<td>Foreign Language Education</td>
<td>M.S.</td>
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<tr>
<td>Guidance</td>
<td>M.S.</td>
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<tr>
<td>Health Education</td>
<td>ED.D., Ph.D.</td>
<td>X</td>
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<tr>
<td>Home Economics Education</td>
<td>M.S.</td>
<td>X</td>
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<tr>
<td>Industrial Education</td>
<td>M.S.</td>
<td>X</td>
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<tr>
<td>Instructional Materials</td>
<td>M.S.</td>
<td>X</td>
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<tr>
<td>Mathematics Education</td>
<td>M.S.</td>
<td>X</td>
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<tr>
<td>Music Education</td>
<td>M.S.</td>
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<tr>
<td>Physical Education</td>
<td>M.S., Ed.D.</td>
<td>X</td>
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<tr>
<td>Public Health Education</td>
<td>M.P.H.</td>
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<tr>
<td>Recreation</td>
<td>M.S.</td>
<td>X</td>
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<tr>
<td>Safety Education and Service</td>
<td>M.S., Ed.S.</td>
<td>X</td>
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<tr>
<td>School Health Education</td>
<td>M.S.</td>
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<tr>
<td>Science Education</td>
<td>M.S.</td>
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<tr>
<td>Social Science Education</td>
<td>M.S.</td>
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<tr>
<td>Special Education</td>
<td>M.S.</td>
<td>X</td>
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<tr>
<td>Vocational Rehabilitation Counseling</td>
<td>M.S.</td>
<td>X</td>
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<tr>
<td>Vocational-Technical Education</td>
<td>ED.S., ED.D.</td>
<td>X</td>
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<table>
<thead>
<tr>
<th>College of Engineering</th>
<th>DEGREE</th>
<th>ADMISSION TEST REQUIRED</th>
<th>LETTERS OF RECOMMENDATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Aerospace Engineering</td>
<td>M.S., Ph.D.</td>
<td>X</td>
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<tr>
<td>* Chemical Engineering</td>
<td>M.S., Ph.D.</td>
<td>X</td>
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<tr>
<td>Civil Engineering</td>
<td>M.S., Ph.D.</td>
<td>X</td>
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<tr>
<td>* Electrical Engineering</td>
<td>M.S., Ph.D.</td>
<td>X</td>
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<tr>
<td>Engineering Administration</td>
<td>M.S.</td>
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<tr>
<td>* Engineering Science</td>
<td>M.S., Ph.D.</td>
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<tr>
<td>Environmental Engineering</td>
<td>M.S.</td>
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<tr>
<td>* Industrial Engineering</td>
<td>M.S.</td>
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<tr>
<td>* Mechanical Engineering</td>
<td>M.S., Ph.D.</td>
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<tr>
<td>Metallurgical Engineering</td>
<td>M.S., Ph.D.</td>
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<tr>
<td>Nuclear Engineering</td>
<td>M.S., Ph.D.</td>
<td>X</td>
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</tr>
</tbody>
</table>

5-All Ed.S., Ph.D. and Ed.D. applicants obtain special forms from the Graduate School.
<table>
<thead>
<tr>
<th>College of Home Economics</th>
<th>Degree</th>
<th>APT.</th>
<th>ADV.</th>
<th>G.R.E.</th>
<th>G.M.A.T.</th>
<th>Letters of Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child and Family Studies</td>
<td>M.S.</td>
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<td>(Memphis, Nashville and Knoxville)</td>
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1 Offered only at UT Space Institute.
2 Offered also at Oak Ridge and Kingsport.
3 Department doctoral option offered under the major of Home Economics.
4 Interdisciplinary, option offered in each department.
5 Ph.D. applicants only.
6 American applicants only.
7 Ed.D. applicants only.
8 Ed.S. applicants only.
9 International applicants only.
The University of Tennessee, Knoxville, is to offer instruction on all levels of higher education, engage in and train for research, and provide extended services of great variety. The obligations of this mission are reinforced by the fact that The University of Tennessee is both the State University and the official Land-Grant Institution of Tennessee.

Advanced Graduate Work and Research

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

This research obligation is not primary in all colleges, but the search for new knowledge and its application to the changing needs of society is a major aim of The University of Tennessee.

So far as publicly-supported higher education is concerned, The University of Tennessee, Knoxville, is the center of advanced graduate training and research. As of 1975 the University provides Master’s level work in over 100 fields of knowledge and doctoral work in 49, enrolling more than 6,600 graduate students.

Off-Campus Graduate Centers

Kingsport University Center: The University of Tennessee offers at Kingsport resident graduate programs in science, engineering, and business at both the Master’s and Doctor’s level. The program is operated within the policies set by the Graduate Council of The University of Tennessee and is administered by the Vice Chancellor for Graduate Studies and Research. It is coordinated with the graduate and undergraduate offerings of East Tennessee State University.

Students who enroll in this program must be admitted to the Graduate School of The University of Tennessee either as degree candidates or non-degree graduate students. Information and appropriate application forms may be obtained from the Director, Kingsport University Center, The University of Tennessee, P. O. Box 9, Kingsport, Tennessee 37662.

Oak Ridge Resident Graduate Program: The University of Tennessee offers graduate study programs at Oak Ridge, with work leading to the Master’s degrees in Industrial Management, Industrial Education, and statistics; and the Master’s and Doctor’s degrees in the areas of engineering, mathematics, and physical and biological sciences. Courses are given in the late afternoons, evenings and Saturdays, with research facilities provided by and used in cooperation with the Oak Ridge Associated Universities, and the Union Carbide Corporation Nuclear Division. Information and applications to the Graduate School may be obtained by writing the Director, University of Tennessee Graduate School, Post Office Box 117, Oak Ridge, Tennessee 37830.

Chattanooga Graduate Engineering Program: The University of Tennessee offers a program of graduate work leading to the Master’s degree in the area of engineering. Courses are given at The University of Tennessee at Chattanooga in the late afternoons and evenings. Students who enroll in this program must be admitted to the Graduate School of The University of Tennessee, Knoxville, either as degree candidates or non-degree graduate students.

Information concerning this program may be obtained from the Director, Chattanooga Engineering Graduate Program, The University of Tennessee at Chattanooga, Chattanooga, Tennessee 37401.

The University of Tennessee Space Institute: Opportunities for graduate study leading to the degrees of Master of Science and Doctor of Philosophy in certain areas of engineering and science are offered by the Space Institute located adjacent to the Arnold Engineering Development Center, Tullahoma, Tennessee. At the present time, graduate degree programs are available with a major in Aerospace Engineering, Aviation Systems, Computer Science, Electrical Engineering, Engineering Science, Applied Mathematics, Mechanical Engineering, and Physics. In addition to the fundamental academic work characteristic of each discipline, research opportunities and supporting interdisciplinary course work are available to permit
admission to the Graduate School requires a Bachelor's degree, or its equivalent, with a satisfactory grade point average from an accredited college or university. (A minimum grade point average of 2.5 out of a possible 4.0, or a 3.0 for the senior year, is considered a satisfactory grade point average. Meeting the minimum admission requirement does not insure acceptance into a degree program since other factors may prevent admission in some areas.)

An application cannot be processed without the $10 fee (payable to The University of Tennessee). If permission to enter The University of Tennessee Graduate School is given prior to graduation, this admission is automatically withdrawn if the Bachelor's degree is not awarded before the date of registration.

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

Admission to the Graduate School does not imply admission to candidacy for the degree desired; admission to candidacy must be obtained after entry.

**Types of Admissions**

**Admission to a Graduate Degree Program:**

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

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

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

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

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

**Eligibility of Seniors:** A senior in The University of Tennessee who needs less than 45 quarter hours to complete the requirements for a Bachelor's degree and has at least a B average (3.0), may take sufficient work for graduate credit to make a total of not more than 15 credit hours per quarter, subject to the approval of the Vice Chancellor for Graduate Studies and Research. Such approval must be obtained each quarter at registration through the graduate office.

**Admission of Faculty Members:** Faculty members may be admitted to the Graduate School through established procedures. However, the following persons may not receive doctoral degrees from The University of Tennessee, Knoxville:

a. Any member of the instructional, research, library, or administrative staff holding the rank of assistant professor and above or equivalent status at The University of Tennessee, Knoxville;

b. Staff in the Institute of Agriculture holding rank of associate professor and above or equivalent status and occupying full-time research and extension positions;

c. Any member of The University of Tennessee system administration holding the rank of assistant professor and above or equivalent status, except in the case of Institute of Agriculture personnel as specified in "b" above.

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

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

**Admission of International Students:**

The Graduate School can accept only students who have outstanding records. A student from China must possess a Bachelor's degree with a grade point average of 8.00 or above for the last two years of a four-year program. A student from India must be First Class the last two years of a four-year Bachelor's degree program after completion of the twelfth...
grade. All students with a Master's degree must be First Class. Applicants from other countries will be evaluated upon receipt of transcripts.

An applicant must present: (1) a complete and accurate chronological outline of all prior university-level education; (2) authorized school or university records, with certified translations if the records are in a language other than English; (3) evidence of financial resources sufficient to provide him with at least $4400 (U.S.) per academic year during his period of registration as a student; and (4) certification of proficiency in English. Every international student must submit a score of at least 475 on the Test of English as a Foreign Language (TOEFL) in order to gain admission.

The complete file (application, official certificates, descriptive titles of courses studied, detailed transcripts including marks gained in final examinations and English proficiency certification) must be submitted to the Graduate Office approximately six months in advance of the quarter in which the applicant hopes to gain admission. An applicant who is accepted will receive the necessary forms to enable him to obtain a student visa. The University of Tennessee will not consider for admission any student who has entered the United States on an I-20 issued by another institution. No international student can gain admission as a post-baccalaureate or non-degree student. A student whose native language is not English must pass an English proficiency examination after arrival at the University. Students who cannot satisfy this requirement must enroll for English 1111, Written and Oral English for Foreign Students (or a course assigned by the English Department) for undergraduate credit and pass this course with a grade of C or better. A student may not take more than six additional hours while enrolled for English 1111. (Any student not passing this examination at a specified level will be sent away from the University to an intensive English program until English proficiency is gained.)

Post-Baccalaureate: When an applicant who has a Bachelor's degree from an accredited institution is ineligible for regular admission to the Graduate School, but feels that eligibility can be shown if given the opportunity, the student may request admission as a Post-Baccalaureate student. A student and the proposed major department must outline a course of study and the student must register for 12 to 15 quarter hours of advanced undergraduate courses (3000-4000 level). If the student completes these with a B average, the student may then become a non-degree student.

Action will be taken after 9 hours of coursework is completed, provided that the student has been employed full-time and has registered for only one course per quarter. (Some departments will not permit a non-degree student to register for graduate credit. Please contact the head of the department in which a major is planned concerning registration for graduate credit.)

A Post-Baccalaureate student cannot receive graduate credit for any of his course work when taken or at a later date. No international applicant may enroll as a Post-Baccalaureate student.

Admission Procedures

Procedures for admission are as follows: (1) complete the "Application for Admission" form (first page of the catalog); select a major from those listed on pages 8-9; (2) return the completed application form along with a $10 application fee as soon as possible; (3) request the registrar of all colleges and universities attended to send two official transcripts to the Graduate School (all documents, including transcripts, submitted for admission become the property of the University and will not be returned); (4) If required, submit scores from the Graduate Record Examination or Graduate Management Admission Test; and (5) request that any reference or rating forms required as part of the application file be sent to the Graduate Office or where indicated.

Anyone with a Bachelor's degree wishing to take courses for graduate credit, whether or not he or she desires to become a candidate for a degree, must make formal application for admission to the Graduate School. Applicants must submit the Certification of Transient Graduate Admission Form. No action is taken until a file is complete.

Examinations

Applicants for admission to many of the degree programs are required to submit scores from the Graduate Record Examination or the Graduate Management Admission Test (GRE or GMAT) for majors requiring these examinations. Each applicant is individually responsible for arrangements for the examination and for transmission of these scores directly from Educational Testing Service to the Vice Chancellor for Graduate Studies and Research. Application forms may be obtained from Educational Testing Service, Princeton, New Jersey 08540, or from the UT Graduate School Office.

The completed application form and examination scores must be submited to the proper office at the Educational Testing Service approximately one month in advance of the test date (tests are given four to five times each year). Approximately six weeks should be allowed for the examination results to reach the University. The University of Tennessee is an approved testing center for both examinations.

Registration Procedures

Dates of registration are listed in the University Calendar (front of catalog). Students should report to the Graduate School to obtain registration materials (scan form and timetable of classes giving details concerning registration procedures) and then should see a department advisor to obtain a signature.

Registration requires two days. The University holds advanced registration each quarter (approximately four to six weeks after each quarter begins). Information may be obtained from the Graduate Office. If a student participates in advanced registration, the student should obtain the class schedule and pay fees on the first day of registration.

All graduate students, including graduate and teaching assistants, research assistants, and scholarship or fellowship holders, should complete the registering procedure at registration (in Stokely Athletic Center) or afterwards at the Treasurer's Office, where the assessment of their tuition and fees will be determined. Those who do not report to the Treasurer's Office before the established deadline for paying fees will be charged the late registration fee.

Fees, Financial Aid, and Fee Classification

University Fees

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

APPLICATION FEE: $10.00

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

If a student applies but does not enter graduate school within 12 months after date of requested admission, it will be necessary for him or her to resubmit the $10 application fee and application. This fee is not refundable.

MAINTENANCE FEE (all students): PER QUARTER $146.00

TUITION (additional for out-of-state students): PER QUARTER $284.00

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

In-State

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

Out-of-State

$48.00 per quarter hour or fraction thereof; minimum charge $144.00

All fees collected at registration are subject to audit for correctness. Adjustments, if needed, will be made after final audit.
UNIVERSITY PROGRAM AND SERVICES FEE:  
PER QUARTER $15.00  
All graduate students taking in excess of six quarter hours per quarter will be assessed a university program and services fee of $15 per quarter. Part-time students taking six quarter hours or less will be assessed at the rate of $1 per quarter hour or fraction thereof; minimum charge $3. Students taking a course load of six hours may elect to pay the full program and services fee.

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

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

Students enrolled exclusively in Evening School or in some off-campus centers will be exempt from the fee.

This fee is not refundable.

LATE REGISTRATION FEE:  
All students are required to have a validated fee receipt to complete the registration procedure. This includes students whose fees are billed, prepaid, or waived. Students who do not complete registration on the regular dates scheduled for this purpose will be charged a late registration fee of $2 up to $30. See the University General Catalog for application of this fee.

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

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

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

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

AUDITORS FEE:  
Fees for courses being audited are the same as courses taken for credit. For fee purposes, non-credit seminars considered as one-hour courses.

REFUND OF FEES FOR WITHDRAWAL:  
Upon receipt of a class schedule, partial or complete, a student is responsible for payment of appropriate fees. Withdrawal from the University after receiving a class schedule, whether partial or complete, must be by official notification to the Office of Special Services. The minimum of 20 per cent of fees will be charged even if classes are not attended. Failure to promptly notify the Office of Special Services when withdrawing could result in a larger percentage fee assessment. The effective date of withdrawal is the date the Office of Special Services is notified and the withdrawal notice is recorded.

For a regular academic quarter, withdrawal within seven calendar days beginning with the first day following regular registration permits an 80 per cent fee refund. Withdrawal between 8 and 14 calendar days following regular registration permits a 60 per cent fee refund. Withdrawal between 15 and 21 calendar days following regular registration permits a 40 per cent fee refund. Withdrawal between 22 and 28 calendar days following regular registration permits a 20 per cent fee refund. The refund policy does not apply to the off-campus Graduate Centers. At the Center, no refund is made after the first 14 days.

No refund is due on courses which are dropped unless the sum of the remaining hours calculated at the hourly rate plus the adjusted charge for the course(s) dropped is less than the total amount paid or the maximum quarterly tuition and/or maintenance fee. On the Knoxville campus no refund is made for courses dropped later than 21 calendar days after the last regular registration day. Refunds resulting from dropping courses will be made after the final audit at the end of the quarter.

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

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

Fee Classification for the Purpose of Paying University Fees

Shortly after a student applies to the Graduate School, he is notified of the receipt of his application and application fee and is advised of his residency classification for fee purposes.

If a student has any questions concerning his residency status, he should contact the Residency Clerk at the Graduate School Office.

If a student is classified as out-of-state and is a full-time employee in the state of Tennessee or at Fort Campbell and elects to attend the University on a part-time basis (6 hrs. or less), he must apply for a waiver of the out-of-state portion of his fees prior to the date of registration each quarter. Forms are available from the Residency Clerk at the Graduate School Office.

Rules for Determination of Status:

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

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

(3) Upon moving to this state, an emancipated person who provides persuasive evidence of domicile may apply for in-state classification for his unemancipated children; and provided that said person is not himself in this state primarily as a full-time student, his unemancipated children may at once be so classified, and may continue to be so classified so long as said person continues his domicile in this state.

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

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

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

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

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

(2) The domicile of a married woman shall be determined by the provisions of these regulations independent of the residence of her husband.

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

Establishment of Domicile:

If a student asserts that he has estab-
lished domicile in Tennessee, he has the burden of proving he has done so.

Appeal. The student who wishes to appeal his/her initial residency classification should contact the residency clerk in the graduate office.

Effective Date for Reclassification. If a student classified nonresident applies for in-state residency classification at the beginning of a quarter or semester and is subsequently denied, his/her in-state residency classification shall be effective at the beginning of the quarter or semester in which he applied for reclassification.

Assistantships and Fellowships

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

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

Student Loans

National Direct Student Loans

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

Loan repayment and interest payments on National Direct Student Loans are deferred until after graduation or as long as an individual remains in half-time attendance at an accredited institution of higher education in the United States. Repayment may also be deferred for a period of three (3) years while the borrower is serving in the Armed Forces, Peace Corps, or Vista. Interest is 3 per cent per year on the unpaid balance and the maximum repayment period is ten (10) years with the current minimum annual repayment of $150 per cent of the accumulated loan, whichever is greater.

If upon graduation one becomes a full-time teacher in a public or non-profit school which is designated by the commissioner as having a high enrollment of low-income families or becomes a teacher of the handicapped, 15 per cent of the total principal plus interest is cancelled for the first and second year of teaching, 20 per cent for the third and fourth years, and 30 per cent for the fifth year. If after graduation one becomes a staff member in a preschool program which is operated for a period comparable to a full school year, 15 per cent of principal plus interest will be cancelled for each year of service. Cancellation at the rate of 12 1/2 per cent of the total principal plus interest will also be made up to 50 per cent of the loan for each year of Armed Forces service in an area of hostility.

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

University of Tennessee Student Loans

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

Student Employment

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

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

Veterans’ Benefits

The Office of the Registrar administers the University’s responsibility for programs of the Veterans Administration. Each veteran or child of a deceased or disabled veteran should apply to the nearest Veterans Administration office for a certificate of eligibility. The application should be made before registration if possible.

Certificates of eligibility are sent directly to students who then bring them to the Office of the Registrar for University authentication and processing.

General Information

The University of Tennessee offers its programs of instruction to qualified persons regardless of race, color, creed, sex, or national origin.
serves as advisors on personal and academic problems.

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

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

University

International House

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

The University Library

The University of Tennessee, Knoxville, Library owns approximately 1,229,423 volumes, 1,615,701 manuscripts, 38,789 microfilm reels and 659,431 items of other microtext, plus recordings, tapes, United States and United Nations documents, and annually receives more than 20,000 periodicals and other serial titles. The library's membership in the Association of Research Libraries indicates an emphasis on research and graduate instruction at the doctoral level and the support of large, comprehensive collections of library materials on a permanent basis.

Interlibrary loan service augments the UTK Library research holdings for faculty and graduate students and includes borrowing monographs, obtaining copies of needed materials, providing access to bibliographic services offered by other institutions, such as computer-based data searches and information retrieval. Library holdings in Knoxville are housed in the James D. Haskins (Main) Library and its five branches: Agriculture, Law, Music, Science-Engineering, and the John C. Hodges Undergraduate Library. Special Collections, located in the Main Library, is a repository of regional and local materials, Tennesseans, and other specialties, including the legislative papers and memoirs of many Tennessee political figures. Its materials are of particular interest to scholars in the fields of history, political science, the social sciences and the arts.

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

The Graduate School

General Regulations of the Graduate School

Responsibility
A graduate student must assume full responsibility for knowledge of rules and regulations of the Graduate School and departmental requirements concerning the individual degree program.

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

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

Graduate Credit
No student may receive graduate credit for a course unless properly admitted to the Graduate School. It is expected that students will be so admitted prior to registration for courses carrying graduate credit. In some instances, however, students who appear to meet the criteria for admission are allowed conditional registration for graduate credit after filing an application for admission to the Graduate School and paying the application fee. Transcripts (two official copies) and additional materials required must then be filed with the Graduate Office at once. If the student is admitted within seven weeks from the last day of registration, the student may receive graduate credit for this course. Should the student not be so admitted, whether because of lack of qualifications or because of failure to furnish the necessary materials in ample time for a decision concerning admission, the courses being taken will be changed to undergraduate credit, and no future registration will be permitted until the student is properly admitted as a graduate student.

Change of Registration
A student's permanent record will show only those courses for which the student is registered one week after the beginning of classes.

The deadline for change of registration (from credit to audit, audit to credit, graduate to undergraduate, undergraduate to graduate, withdrawal, etc.) is set at mid-quarter, approximately 35 calendar days after the first day of classes each quarter. A student may change registration from one course at any time up to and including this date by executing a change of registration slip and submitting this to the Graduate Office. The advisor's signature is not required. The instructor's signature is required to add a course two weeks after classes begin and/or to add a course that is closed. If withdrawal is done by correspondence study with this or any other university.

Office of International Student Affairs

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

The office maintains the student's official immigration records and handles questions regarding immigration regulations. It coordinates such projects as a community volunteer program for international students and activities for student wives. To aid the international student's understanding of American life, its professional staff
occurs after the first week of classes and before the withdrawal deadline, the grade of "W" will automatically be entered on the student's record and on the final class roll sent to the instructor in the course.

A student withdrawing from a course, or from the University, after the withdrawal deadline will receive the grade of "F" unless the student can clearly demonstrate that one of the following conditions exists:

a. illness or injury of the student as verified by the student health service or private physician,
b. serious personal or family problems as verified by the student's parents, minister, physician, etc.,
c. necessary change in work schedule as verified by the student's employer,
d. change of major to a program in which the course the student wishes to drop will not normally be used in satisfying degree requirements. Acceptance of the student into the new program should be verified by the Graduate School,
e. financial inability to continue at the University, or
f. call to active military service.

One of the same conditions must exist for any change of registration. A student will not be permitted to drop a course simply to avoid a poor grade.

A student wishing to withdraw from a course, or from the University, after the withdrawal deadline, or change his or her registration materials at the time of registration, should notify the Office of Admissions and Records, which will enter the grade(s) of "W" or the appropriate change on the student's permanent record.

Maximum Load

All graduate students are urged to register each quarter for only that number of hours which they can successfully complete. The maximum load for a graduate student is 15 hours, and nine to twelve hours is considered a full load. The maximum load for a graduate student in a 45-hour master's thesis program is 18 hours if the student has completed half of the required course work hours (excluding thesis or dissertation) in a program. This would be 11 hours in a 45-hour master's thesis program or 12 hours in a 48-hour non-thesis program or 18 hours in a 72-hour doctoral program.

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

Course Numbers

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

Prerequisites

Graduate work in any department must be preceded by sufficient undergraduate work in the major area and the prerequisites to satisfy the department that the student can successfully do graduate work in the chosen field. All prerequisites are not listed in the Graduate Catalog since undergraduate records are examined and evaluated by the appropriate department before admission to a degree program.

Residence Requirements

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

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

The minimum residence for any Doctor's degree is one academic year or three consecutive quarters of full-time study (minimum of nine hours) in the resident graduate program. A student in residence is devoting essentially all his energies to his graduate study on campus. Part-time enrollment does not count toward this requirement.

Revision of Program

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

The time limit for the use of graduate credit toward a Master's degree is six years from the beginning date of the earliest course applied toward the degree. The last 45 hours of credit for an Educational Specialist Degree must also be earned within a period of six years prior to the award.

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

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

Graduate School News

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

Proficiency Examination

A proficiency examination may be given in any academic course offered for graduate credit. To be eligible, a student must be regularly admitted to the Graduate School, and the examination must be recommended by the head of the department offering the course. Students applying for this privilege must present evidence that they have developed the knowledge and abilities expected of graduate students who have taken the same courses. Upon passing such an examination with a minimum grade of B, the student will receive regular graduate credit. A maximum of three graduate courses may be completed by this method. A fee must be paid before administration of each examination. Proficiency examinations may not be used to raise the grade or change the credit in a course previously completed, nor may such an examination be repeated.

Law Courses

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

Transfer Credits

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

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

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

Credits accepted in either the Master's or Doctor's program will not affect the minimum residence requirements, nor will they be counted in determining the student's grade average. Neither will they count toward meeting 5000- or 6000-level requirements for an advanced degree. Special rules apply for courses completed within the University of Tennessee system.

Thesis Consultant

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

Before a thesis is deposited in the Library, it is the responsibility of the Thesis Consultant to examine the materials and to make sure that the report is mechanically accurate and attractively presented; is free of technical errors in format; is suitable for binding; and reflects credit upon the University and the student. Research courses (thesis credits) and extension courses (non-thesis courses) may be listed in the Graduate Catalog. The emphasis in the program will be on training prospective teachers of undergraduate courses. Participating departments are indicated in the list of "Majors and Degrees Available" on pp. 8-9.

Master's Committee: A committee for the Master's degree is formed at the time the student applies for admission to candidacy. The student should consult with the major professor concerning the composition of a committee. This committee consists of a minimum of 3 members, with the rank of assistant professor or above. If a student does not have a minor, all members may be from his major department. If a
Admission to Candidacy: Application for admission to candidacy for the Master's degree is made after the student completes any required prerequisite courses and at least 15 hours of graduate course work with a B average (no incompletes) in all courses taken for graduate credit. Approval of the Vice Chancellor for Graduate Studies and Research is required. The student must submit the Admission to Candidacy form, with appropriate signatures, to the Graduate Office no later than commencement day of the quarter preceding the quarter in which he plans to graduate. The deadline for submission of this form is given each quarter in the Graduate School News.

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

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

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

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

Specialist in Education Degree

The Specialist in Education (Ed.S.) degree is offered in Curriculum and Instruction, Educational Administration and Supervision, Educational Psychology and Guidance, Safety Education and Service, and Vocational-Technical Education. Students in the Graduate School who become candidates for the Ed.S. must have a minimum of one year of teaching experience or its equivalent. Admission to the Specialist in Education program requires formal application for admission to Graduate School, followed by processing and recommendation by the department or area in which the student is majoring; and is dependent upon final approval by the Vice Chancellor for Graduate Studies and Research.

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

Course Requirements: Each student's program involves a minimum of six quarters of study totaling not less than 90 quarter hours. A student with a Master's degree is required to have at least one quarter of full-time residence. A student without a Master's degree is required to have two consecutive quarters of full-time residence.

A minimum of 12 quarter hours from collateral fields in professional education (outside the major department or area) and 12 quarter hours from fields outside of the College of Education is required for each individual program.

Credits earned in a Master's degree may meet course requirements in the student's Specialist in Education program to which they are specifically comparable. They may be used to meet the student's course requirements. (See Transfer Credits, page 17)

For a student admitted to the program with a Master's degree or appropriate work beyond the Master's degree, program requirements may be modified upon recommendation of the student's committee and approval of the Vice Chancellor for Graduate Studies and Research, except that no modifications shall be permitted with respect to the following: (1) examination requirements, research requirements, and the minimum of 24 quarter hours of course credit outside the department or area in which the student is doing his work; and (2) all graduate course work completed prior to admission accepted as part of the student's program must be appropriately related to the student's objectives.

Undergraduate courses required for certification at the University of Tennessee in the student's field of specialization may not be taken for graduate credit as part of his program. At least 22½ of the last 45 hours of course work, exclusive of the thesis or problems, must be in 5000- or 6000-level courses. The last 45 hours of a student's program (including thesis or problems) must be completed within six years.

Admission to Candidacy: Admission to candidacy is established by formal application to the Vice Chancellor for Graduate Studies and Research, normally during or immediately following the quarter in which the student's course credit totals or exceeds 45 hours and upon the recommendation of the student's committee. Approval of the Vice Chancellor for Graduate Studies and Research is required. The student must submit the Admission to Candidacy form, with appropriate signatures, to the Graduate Office no later than commencement day of the quarter pre-
### Summary of Procedures for Master's Degrees

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<tr>
<td>Admission as a potential candidate (if previously admitted non-degree)</td>
<td>Major departmental advisor and Vice Chancellor</td>
<td>Prior to receiving 18 hours of course work</td>
</tr>
<tr>
<td>Submission of Application for Admission to Candidacy (forms at Graduate Office)</td>
<td>Major professor and student’s committee</td>
<td>B average, no I’s, completed prerequisites, at least one quarter prior to graduation*</td>
</tr>
<tr>
<td>Approval of Admission to Candidacy</td>
<td>Vice Chancellor for Graduate Studies and Research</td>
<td>Prior to commencement</td>
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**GRADUATION REQUIREMENTS**

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<th>PROCEDURE</th>
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<tr>
<td>Placement of name on Graduation List</td>
<td>Student</td>
<td>Indicate on registration material</td>
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<tr>
<td>Application for Diploma</td>
<td>Vice Chancellor for Graduate Studies and Research</td>
<td>See Deadline Notice available at registration*</td>
</tr>
<tr>
<td>Scheduling of Oral or Written Examination</td>
<td>Major professor, student, and Vice Chancellor</td>
<td>Not later than one week prior to Oral or Written Examination*</td>
</tr>
<tr>
<td>Submission of Thesis to Faculty Committee</td>
<td>Faculty Committee</td>
<td>At least one week prior to Oral or Written Examination</td>
</tr>
<tr>
<td>Oral Examination</td>
<td>Major professor and committee</td>
<td>Not later than one week before Thesis deadline*</td>
</tr>
<tr>
<td>Removal of Incompletes</td>
<td>Instructor of Course</td>
<td>Not later than one week before Commencement*</td>
</tr>
<tr>
<td>Submission of final copy of thesis and thesis card</td>
<td>Major professor, candidate’s committee, and Vice Chancellor</td>
<td>After Oral Examination and no later than two weeks before Commencement*</td>
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* Dates are printed in Graduate School News quarterly.

The quarter in which the student plans to graduate. A qualifying examination is required if the student’s Master’s degree was earned six or more years prior to admission to the program. The qualifying examination may be written, oral, or both written and oral.

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

A minimum of nine hours of research credit (5180, 5190, and 5200) is required. If the student does not complete the research during the first quarter registered for 5200, the student must continue to register for this course (3 hours credit) each quarter as long as active work on the thesis continues or until the thesis is accepted by the Graduate Office. The thesis is to be prepared according to the instructions in the Graduate School Thesis and Dissertation Manual. It should be approved by the committee prior to submission and must be submitted by the appropriate date the quarter the student wishes to graduate.

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

**Doctor’s Degrees**

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

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

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

**Continuous Registration:** Registration for course 6000 is necessary whenever a student is working on the dissertation. A minimum registration of 36 quarter hours of course 6000 is required of all doctoral candidates before the dissertation will be accepted. The student will continuously register for course 6000 (minimum of three hours) from the time that the doctoral research proposal is approved, admission to candidacy is accepted, or registration for course 6000 is begun, whichever comes first, including the quarter in which the dissertation is accepted by the Graduate School. (NOTE: Continuous registration is interpreted to include the summer quarter.) If a student must be away from the University during the doctoral study the student may, upon recommendation of the department head and approval of the Vice Chancellor for Graduate Studies and Research, be granted a leave of absence from the requirement for periods not exceeding eight quarters.

**Preliminary Examination:** A comprehensive written preliminary examination which is an indication of the student’s fitness for completing the program is required of each person working toward the doctorate. The nature and time of the examination will be determined by the student’s major department or faculty committee. The preliminary examination must be passed prior to admission to candidacy and at least three quarters in advance of conferral of the degree. The doctoral program must be completed within a period of five years after passage of preliminary examinations.

**Language Requirements:** Usually candidates for the Ph.D. degree must possess a reading knowledge of at least one foreign language in which there exists a significant body of literature relevant to their major field of study. Some programs require two languages and some none.

Language requirements must be met at The University of Tennessee and cannot be transferred from another institution. Refer to the departmental descriptions of each Ph.D. program. The student’s faculty committee will determine, with the approval of the Vice Chancellor for Graduate Studies and Research, the specific language (or languages) required. When the student feels adequately prepared to take a language examination, he or she should notify the language representative in the department. The appropriate forms to schedule the examination may be obtained from the Graduate Office. The dates and times of the examinations are printed in the Graduate School News.

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

**Admission to Candidacy:** A student may be admitted to candidacy after passage of the

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

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<th>PROCEDURE</th>
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<tr>
<td>Admission as a potential candidate (if previously admitted non-degree)</td>
<td>Major departmental advisor and Vice Chancellor</td>
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</tr>
<tr>
<td>Submission of Application for Admission to Candidacy (obtain forms from the Graduate Office)</td>
<td>Major professor and Vice Chancellor</td>
<td>At least one quarter prior to graduation*</td>
</tr>
<tr>
<td>Approval of Admission to Candidacy</td>
<td>Vice Chancellor</td>
<td>Prior to Commencement</td>
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<tr>
<td>GRADUATION REQUIREMENTS</td>
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<tr>
<td>Placement of name on Graduation List</td>
<td>Student</td>
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<tr>
<td>Application for Diploma</td>
<td>Vice Chancellor</td>
<td>See Deadline Notice available at registration*</td>
</tr>
<tr>
<td>Scheduling of Oral or Written Examination</td>
<td>Major professor, Vice Chancellor, and student</td>
<td>Not later than one week prior to Oral or Written Examination*</td>
</tr>
<tr>
<td>Submission of Thesis or Problems to Faculty Committee</td>
<td>Faculty Committee</td>
<td>At least one week prior to Oral Examination</td>
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<tr>
<td>Oral Examination</td>
<td>Major professor and committee</td>
<td>Not later than one week prior to Thesis/Problems deadline*</td>
</tr>
<tr>
<td>Removal of Incompletes</td>
<td>Instructor of Course</td>
<td>Not later than one week before Commencement*</td>
</tr>
<tr>
<td>Submission of final copy of thesis and thesis card</td>
<td>Major professor, candidate's committee, and Vice Chancellor</td>
<td>After Oral Examination and no later than two weeks before Commencement*</td>
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* Dates are printed in Graduate School News quarterly.
preliminary examinations, fulfillment of the language requirements (for Ph.D.), and maintenance of at least a B average in the courses. (Each doctoral student must plan to take an appropriate number of 6000-level courses, usually a minimum of nine quarter hours, which are designed expressly for doctoral students at The University of Tennessee, during his program of study. These courses cannot be transferred from another institution.) Admission to candidacy must be secured at least three quarters prior to the date the degree is to be conferred. Each student is responsible for filing his application for admission to candidacy, which must be signed by the committee members and approved by the Vice Chancellor for Graduate Studies and Research. The student will be notified when admission to candidacy has been approved.

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

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

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

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<tr>
<td>*Preliminary Examination</td>
<td>Major department</td>
<td>Prior to Admission to Candidacy</td>
</tr>
<tr>
<td><em>Foreign Language Examination(s)</em>*</td>
<td>Major department and language department jointly</td>
<td>Prior to Admission to Candidacy</td>
</tr>
<tr>
<td>*Appointment of Faculty Committee</td>
<td>Vice Chancellor for Graduate Studies and Research</td>
<td>Prior to Admission to Candidacy</td>
</tr>
<tr>
<td>Approval of Admission to Candidacy (obtain blanks from Graduate Office)</td>
<td>Faculty Committee and Vice Chancellor for Graduate Studies and Research</td>
<td>At least three quarters prior to graduation</td>
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#### GRADUATION REQUIREMENTS

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<tr>
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<td>Vice Chancellor</td>
<td>See Deadline Notice available at registration**</td>
</tr>
<tr>
<td>Scheduling of Oral Examination</td>
<td>Faculty Committee and Vice Chancellor for Graduate Studies and Research</td>
<td>When approved by Faculty Committee and at least one week prior to Oral Examination**</td>
</tr>
<tr>
<td>Submission of Dissertation to Faculty Committee</td>
<td>Faculty Committee</td>
<td>At least two weeks prior to Oral Examination</td>
</tr>
<tr>
<td>Oral Examination</td>
<td>Faculty Committee</td>
<td>Not later than one week before Dissertation deadline**</td>
</tr>
<tr>
<td>Removal of Incompletes</td>
<td>Instructor of Course</td>
<td>Not later than one week before Commencement**</td>
</tr>
<tr>
<td>Submission of final copy of Dissertation, doctoral forms, and thesis card.</td>
<td>Faculty Committee and Vice Chancellor for Graduate Studies and Research</td>
<td>After Oral Examination and at least two weeks before Commencement**</td>
</tr>
</tbody>
</table>

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

In March 1974 the College of Veterinary Medicine was established within the Institute. The new college is developing research and graduate programs in veterinary medical sciences in addition to the professional curriculum leading to the degree, Doctor of Veterinary Medicine. The first students will be admitted in the fall of 1976.

Agricultural Experiment Station

John A. Ewing, Dean
Thomas J. Whatley, Assistant Dean
D. M. Gossett, Assistant Dean

The Agricultural Experiment Station was established by the University's Board of Trustees on June 8, 1882, which was five years before the passage of the Hatch Experiment Station Act by the U.S. Congress. The University was one of the first five institutions in the U.S. to establish an Agricultural Experiment Station. Since its beginning the Station has given first attention to investigations of concern to the agriculture of Tennessee. The Investigations of the Station follow a systematic method of gaining and applying knowledge efficiently to the biological, physical, and economic phases of producing, processing, and distributing farm and forest products; to the social and economic aspects of rural living; and to consumer health and nutrition.

Both farm and urban populations gain from the accomplishments of the Agricultural Experiment Station. Examples of some of these accomplishments are new and improved varieties of crops, new and better methods of controlling crop and livestock pests, more efficient production of crops and pasture through improved fertilization and mechanization, and more efficient feeding and management of livestock.

The program is designed and administered through 16 subject matter departments located at Knoxville. A number of the staff have teaching responsibilities in addition to their research. To assist in the research program the Station supports a large number of graduate students. To serve Tennessee's diverse agriculture, branch stations are operated at Jackson, Spring Hill, Springfield, Lewisburg, Crossville, Greeneville, and Martin. In addition, field stations are operated at Grand Junction, Milan, Wartburg, Tullahoma, and near Chattanooga. Professional and technical staff are in residence at these locations.

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

Agricultural Extension Service

W. D. Bishop, Dean
M. L. Downen, Assistant Dean
T. W. Hinton, Assistant Dean
Mildred F. Clarke, Assistant Dean

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

The educational program is carried on through offices in each of the 95 counties of the state. Education emphasis includes work in five major program areas: agricultural production, marketing of agricultural products, development and conservation of natural resources, home economics, and education of young people through 4-H Clubs. County Extension staff members working directly with local people are supported in the various informational fields by a specialist staff, members of which are stationed either in Knoxville, Nashville or Jackson.

The Agricultural Extension Service operates administratively as one of three units of the Institute of Agriculture. For administration the state is divided into five districts with supervisors located in their respective districts. District headquarters are maintained in Knoxville, Chattanooga, Cookeville, Nashville, and Jackson.
The Agricultural Extension Service operates as a three-way partnership among county, state, and federal governments. The University of Tennessee represents state and federal government and a County Agricultural Extension Committee represents county government in this partnership.

College of Agriculture
O. Glen Hall, Dean

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

The graduate student is expected to demonstrate a thorough knowledge of the subject matter in his/her specialized field of study and its relationship to the sociological and environmental impact on society. The student must demonstrate the ability to plan, conduct, analyze, and report original research.

More importantly, emphasis is given to intellectual growth and to the development of scholarly reasoning and analysis to the end that the graduate will continue to grow and develop professionally throughout his/her career.

MASTER OF SCIENCE PROGRAMS

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

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

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

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

Normally, graduate programs will include the thesis requirement. There are, however, two exceptions.

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

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

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

DOCTORAL PROGRAMS

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

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

Agricultural Economics and Rural Sociology

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

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

1. General Agricultural Economics
2. Agricultural Marketing and Price Analysis
3. Farm Management and Production Economics
4. Economics of Agricultural Development

B. The Core Areas:

1. Agricultural Economics
2. Economic Theory
3. Mathematical and Quantitative Methods in Agricultural Economics

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

Agricultural Engineering

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

1. Agricultural Power and Machinery
2. Soil and Water Conservation Engineering
3. Agricultural Structures
4. Electric Power and Processing

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

Additional course requirements for the degree are:

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

Animal Science

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

1. Animal Nutrition
2. Animal Breeding
3. Animal Physiology
4. Animal Products

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

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

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

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

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

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

Plant and Soil Science

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

1. Soils
2. Plant Breeding and Genetics
3. Crop Physiology and Ecology

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

Some of the specific requirements for the degree are:

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

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

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

Departments of Instruction

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

Agricultural Biology

**DEGREE**

Agricultural Biology

**MAJOR**

1. C. J. Southard (Head), Ph.D. North Carolina State; G. W. Johnson, Ph.D. Louisiana State.

Associate Professors:

1. J. W. Hilty, Ph.D. Ohio State; C. D. Pitzer, Ph.D. Clemson; H. E. Reed, Ph.D. Ohio State; J. L. Wilson, Ph.D. Tennessee.

**Assistant Professors**

1. R. Gerhardt, Ph.D. North Carolina State; P. L. Lambdin, Ph.D. UPI and SU; E. H. Moody, Ph.D. Univ. of Calif. (Davis).

2. Introductory Plant Pathology (4)

- Principles of plant pathology illustrated by diseases of common agricultural crop plants. Prereq: Introductory Botany or Zoology. Graduate credit for non-majors only. 3 hrs and 1 lab. (Same as Botany 3130.)

3. Economic Entomology (4)

- Structure, life history, habits, and principles of control of important insect pests of farm, garden, orchard, and household. 2 hrs and 2 labs.

4. Apiculture (3)

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

5. Biology of Soil Microorganisms (4)

- A study of the morphology and physiology of soil organisms, decomposition of organic matter, chemical transformations, and interactions between soil organisms and higher plants. Prereq: Introductory Microbiology or Botany 3130. 3 hrs and 1 lab.

6. Forest and Shade Tree Entomology (3)

- Identification, biology, ecology, and control of forest and shade tree pests. Prereq: 3210 or equivalent. 2 hrs and 1 lab.

7. Research Methods and Instrumentation in Plant Pathology and Entomology (3)

- Techniques for laboratory, field and greenhouse research in plant pathology and entomology. 1 hr and 2 labs.

8. Plant Parasitic Nematodes (4)

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

9. Plant Disease Control (3)

- Basic problems and principles involved in controlling plant diseases. Prereq: 3130.

10. Field Crop and Vegetable Insects (3)

- Taxonomy, biology, and control of insects affecting field and vegetable crops. Prereq: 3210 or equivalent course in applied entomology. 2 hrs and 1 lab.

11. Insect Pests of Man and Animal (3)

- A study of the taxonomy, biology and control of those insects parasitic on domestic animals and those found in human habitation. Prereq: 3210 or equivalent course in applied entomology. 2 hrs and 1 lab.

12. Special Problems in Plant Pathology or Economic Entomology (1-6)

- Comprehensive individual study of current problems in economic entomology or plant pathology. May be repeated. Maximum 9 hrs.

13. Seminar (1)

- Review of literature and current research in plant pathology and economic entomology. May be repeated. Maximum 3 hrs.

Agricultural Economics and Rural Sociology

**DEGREE**

Agricultural Economics

**MAJOR**

1. J. A. Martin (Head), Ph.D. Minnesota; M. B. Bacheler, Ph.D. Washington; W. Brown, Ph.D. Iowa State; Irving Dubov, Ph.D.

2. Coliforms (Berkeley); L. H. Keller, Ph.D. Kentucky; F. O. Leuthold, Ph.D. Wisconsin.

Assistant Professors:


Assistant Professors:

1. S. D. Mundy, Ph.D. Tennessee; B. J. Trevena, Ph.D. Tennessee.

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

**Agricultural Econтомics**

1. Agricultural Prices (3) Factors determining prices of farm products. Effects on prices of varying degrees of competition and monopoly. Information on prices and related market data. Uses of price information and techniques of analysis in determining outlook for farm prices.

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

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


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

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


8. Agricultural and Rural Program Planning (3) Decision-making concepts applied to design and implementation of local-action programs. Case examples from the U.S. and other
5610 Quantitative Methods in Agricultural Economics (3) Study of analytical techniques useful in estimation of functions—supply, demand and production—and prediction of economic variables. Emphasis on the application of multiple regression; model specification, estimation techniques using computer and interpretation of results. Prereq: 5510 or Economics 5510 or consent of instructor.

5710 Quantitative Methods in Agricultural Economics (3) Study of linear programming technique with empirical applications, made to problems of maximizing profit, minimizing cost, firm growth, transportation, and location. Other topics include input-output analysis, recursive programming, game theory, and nonlinear programming. Prereq: Economics 4190 or consent of instructor.

6000 Doctoral Research and Dissertation

6110-20-30 Seminars in Agricultural Economics (3, 5, 3) Topics will be selected from the following: traditional agriculture, resource use, population and the environment; problems of efficiency of plant operation; market organization, structures, and price policies. Application of imperfect competition theory to the marketing policies of agricultural processing and merchandising firms.

4610 Management of Farm Supply and Marketing Firms (3) Operation of firms selling farm supplies and merchandising agricultural products. Emphasis on accounting data and economic framework for managerial decision making.

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

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

5000 Thesis

5011 Special Problems in Lieu of Thesis (3)

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

5130 Advanced Agricultural Production Economics (3) The theory and empirical concepts of agricultural production economics under conditions of uncertainty. Prereq: 4140 or equivalent.

5210 Seminar: Agricultural Policies (3)

5220 Seminar: Methodology of Research (3)

5230 Seminar: Adjustments to Industrialization (3)

5310 Research (3) Special research problems in Agricultural Economics and Rural Sociology. Gathering, tabulating and interpreting data and report writing. May be repeated. Maximum 9 hrs.

5410 Agricultural Marketing Analysis (3) Application of tools of economic analysis and measurement to problems at all levels of the marketing system for agricultural commodities. Prereq: 4200 or consent of instructor.

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

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

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

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

6000 Doctoral Research and Dissertation

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

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

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

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

3220 Agricultural Structures (3) Functional planning of structures; environmental control construction methods, properties of building materials, and cost estimation. Prereq: Introduction to Agricultural Engineering; General Mathematics (6 hrs). 2 hrs and 1 lab.

3510 Agricultural Utilities and Processing Equipment (4) Electrical equipment; controls; water systems; heating and refrigerating systems; waste disposal systems. Prereq: Introductory Agricultural Engineering; Introductory Physics (6 hrs). 3 hrs and 1 lab.

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

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

4180 Equipment and Techniques for Application of Fertilizers (4) Equipment for application of liquid, solid, and gaseous chemicals; system components; operational characteristics; and considerations; calibration, selection and management; materials handling and disposal methods. 2 hrs and 1 lab.

4210 Agricultural Machinery and Tractors (4) Agricultural machinery and power units; adaptation to agricultural practices; field efficiencies, capacities, adjustment and servicing. Prereq: Introduction to Agricultural Engineering; General Mathematics (5 hrs). 3 hrs and 1 lab.

5000 Thesis

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

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

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

5320 Evaluation in Programs of Agricultural Extension (3) Principles, instruments, and techniques of identifying, gathering, analyzing and using data to appraise planning and teaching and to determine the nature and extent of extension service, its origin, legislation and growth and the nature of present day objectives and programs. Prereq: 3110 or consent of instructor.

5330 Supervision of Agricultural Extension Programs and Personnel (3) Theories and techniques of human effectiveness; principles of successful supervision applied to various parts of county, district and other extension programs, and planning for effective office management. Prereq: 5210 or 5220 or consent of instructor.

Animal Science

MAJOR

Agricultural Extension

DEGREES

Animal Science

M.S., Ph.D.

Professors:

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

Associate Professor:

C. E. Carter, Jr., Ph.D. Ohio State.

J. P. Hitchcock, Ph.D. Michigan State;

J. W. Holloway, Ph.D. Oklahoma State;

F. B. Masincupp, Ph.D. Illinois State;

J. D. Smalling, Ph.D. Texas A & M.

3210 Anatomy and Physiology of Farm Animals (4) Skeletal and muscular, cardiovascular, nervous, endocrine, respiratory, digestive, renal and urinary systems; demonstrations, physiology-chemical phenomena. Prereq: General Biology or Animal Science for Agriculture. 3 hrs and 1 lab.

3220 Physiology of Reproduction (3) Comparative anatomy and physiology of the reproductive systems of higher vertebrates; gametogenesis, fertilization, implantation, prenatal growth and parturition and initiation of lactation; endocrine regulation of reproductive phenomena. Prereq: 3210 or consent of instructor. 2 hrs and 1 lab. (Same as Zoology 3220.)

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

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

4140 Heredity in Animals (3) Basic chromosomal mechanism of heredity with emphasis on Mendelian principles and their application to the selfish and social tendencies of species such as linkage and cytoplasmic inheritance. Introductions to the biochemical basis of heredity and to quantitative inheritance. Illustrations of principles with examples in species with which students in agriculture are familiar. Prereq: Animal Science for Agriculture. 2 hrs and 1 lab.

4240 Principles of Animal Breeding (3) Genetic principles in the breeding of economic species. Genetic basis of variation. Partitioning of variation according to various kinds of characters. Significance of heredity in environment. Selection and its consequences. Mating systems and their effects on populations. Planning breeding programs. Prereq: 3410 or equivalent. 2 hrs and 1 lab.

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

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

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

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

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

4230 Applied Reproduction in Farm Animals (3) Methods and techniques in collecting, evaluating, processing and preserving semen; insemination of females; pregnancy determina-
28 Institute of Agriculture

4310 Feeding Systems for Ruminants and Horses (3) Nutrition and feeding principles in the comparison of feeding systems utilized during the life cycle of cattle, horses and sheep. Prereq: 3330. 2 hrs and 1 lab.

4320 Feeding Systems for Poultry and Swine (3) Nutrition and feeding principles in the comparison of feeding systems utilized during the life cycle of poultry and swine. Laboratory feeding trials to demonstrate basic nutrition concepts. Prereq: 3330. 2 hrs and 1 lab.

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

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

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

4830 Pork Production and Management (4) Principles of selection, nutrition, breeding, physiology and marketing in a complete pork production and management program. Structure of the industry, enterprise establishment, systems of production, production practices and herd improvement programs. Alternatives will be evaluated in terms of production response and economic returns. Prereq: Consent of instructor. 3 hrs and 1 lab.

4840 Poultry Production and Management (4) Structure of the poultry industry, organization and management of poultry enterprises including rearing, housing, feeding, processing and marketing. Prereq: Consent of instructor. 3 hrs and 1 lab.

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

4860 Lamb and Wool Production and Management (3) Integration of the principles of selection, nutrition, breeding, physiology and marketing into a complete lamb and wool production and management program. Structure of the industry, enterprise establishment, systems of production and production practices; economic returns. Prereq: Consent of instructor. 2 hrs and 1 lab.

5000 Thesis

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

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

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

5230 Advances in Mammalian Reproduction (3) Germ cell development, maturation, transport, metabolism, sterilization, induction of estrus and embryonic mortality. Prereq: 3220 or 4230. 2 hrs and 1 lab.

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

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

5321 Energy in Animal Nutrition (4) Energy sources in animal feeds; carbohydrate and lipid compounds; nutritional functions, metabolism, evaluation and requirements. Prereq: 3520 or consent of instructor. 3 hrs and 1 lab.

5331 Proteins in Animal Nutrition (3) Proteins in feeds; amino acids and non-protein nitrogenous compounds, nutritional functions, metabolism, evaluation and requirements. Prereq: 3520 or consent of instructor.

5341 Vitamins and Minerals in Animal Nutrition (3) Vitamins and minerals in animal nutrition, physiology, metabolism, evaluation and requirements. Prereq: Consent of instructor.

5400 Genetics of Animal Populations (3) The population and the individual, gene and zygotic frequencies; statistical descriptions of populations; forces influencing genetic changes; application to animal breeding. Prereq: 3420 or consent of instructor. 2 hrs and 1 lab.

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

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

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

6000 Doctoral Research and Dissertation

6150 Topics in Milk Constituents (3) Properties of milk constituents and their relationship to milk and dairy products. Prereq: FT&S 4050. 3 hrs and 1 lab.

6160 Topics in Dairy Microbiology (3) Microbiological problems related to various phases of the dairy industry.

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

6220 Environmental Physiology of Farm Animals (3) Environmental factors and their measurement; physiological mechanisms of response to environmental factors and their measurement; interrelationships of animals and environment in terms of productivity and health. Prereq: Consent of instructor. 2 hrs and 1 lab.

6230 Animal Growth and Development (3) Physiological and nutritional aspects of growth of farm animals; effects of growth rates on physiological and productive functions. Prereqs: 5321 and 5331 or consent of instructor.

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

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

6429 Animal Breeding Research Methods and Interpretation (3) Obtaining valid estimates of genetic parameters in animal breeding studies; least squares adjustment of data; the partition of variance; phenotypic, genetic, and environmental correlations; repeatability; heritability; and selection indexes. Prereq: 5410 and 5710.

6611 Advanced Topics in Animal Products (1-6) Recent advances and concepts, research techniques, current problems; may be repeated. Maximum 6 hrs.

6910 Seminar (1) Seminars in animal nutrition, breeding, physiology and products. May be repeated. Maximum 6 hrs.

Food Technology and Science

MAJOR DEGREE

Major
Food Technology

M.S.

Ph.D.

Professors:

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

Associate Professors:

J. L. Collins, Ph.D. Maryland; B. J. DoMatt, Ph.D. Michigan State; H. O. Janes, Ph.D. Illinois; C. C. Melton, Ph.D. Kansas State.

Assistant Professors:

E. A. Childs, Ph.D. Georgia; S. L. Melton, Ph.D. Tennessee; M. J. Riemann, Ph.D. Kansas State.

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

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

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

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

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

4020 Dairy Products II (4) Principles in the manufacture of butter, cheese and special dairy products. Prereq: 3020. 3 hrs and 1 lab.

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

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

4120 Food Quality Assurance (3) Systems for quality assurance in food industries. Various
Applications of current instrumental methods and lab. applied to the research, development and market- 
ments of the art, science and technology associated with food. Consent of department head. Credits

5200 Research (1-5) Research in selected areas. Prerequisites: 10 hrs basic biology or botany. 2 hrs and 1 lab.

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

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

5130 Food Enzymology (3) Commercial and native enzymes in manufacturing, processing, and spoilage of food. Prerequisite: Food Microbiology. 2 hrs and 1 lab.

5140 Food Flavors (3) Food flavor maintenance and improvement. Natural and synthetic compounds in the manufacture of foods with predictable consumer acceptance. Technology of flavor manufacture and formulation. Techniques for determining flavor profile. Prerequisites: 4120. 2 hrs and 1 lab.

5150 Fats and Oils (3) The application of scientific principles to commercial technology of fats and oils. Prerequisites: 3210. 2 hrs and 1 lab.

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

5310 Food Products Development (3) Fundamentals of the art, science and technology applied to the development, research and marketing of new food products and processes. Prerequisites: 4120 or 4310. 2 hrs and 1 lab.

5320 Food Thermobiology (3) Fundamentals of heat and the relationship to the rate of destruction of microorganisms and to the rate of loss of food quality through the calculation of minimum lethal thermal processes for hermetically sealed packages of foods. Prerequisites: 3220. 2 hrs and 1 lab.

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

5510 Meat Technology (3) Physical and chemical characteristics of meat and the ultimate influence of these changes have on quality and composition; meat preservation, and quality control. Prerequisites: 3840. 2 hrs and 1 lab.

5530 Microorganisms Common in Food Products (3) Identification of desirable and undesirable microorganisms in food products and their relationship to manufacturing operations. Prerequisites: 4120 or 4310. 2 hrs and 1 lab.

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

Forestry

MAJORS

DEGREES

Forestry

Wildlife and Fisheries Science

M.S.

Wildlife and Fisheries Science

M.S.

Assistant Professors:

E. R. Buckner, Ph.D. North Carolina State;


Assistant Professors:

L. R. Steadman, Ph.D. Colorado State; D. M. Ostermeier, Ph.D. Syracuse; J. Rennie, Ph.D. North Carolina State.

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

*3840 or consent of instructor. 1 hr and 2 labs.

4002 Utilization (3) Wood-using industries; processing forest products—sawmills, tree-logging; pulpwood operations, flooring plants, treating plants; plant layout, flow diagrams. Prerequisites: 3120.

3320 Principles of Silviculture (3) Influence of site factors on reproduction, growth, development, and character of forest vegetation; classification of forest structure; silvicultural laws. Prerequisites: 3020 or General Ecology: 3040; Soils.

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

4006 Silvicultural Methods (4) Methods and application of intermediate and regeneration cuttings; site preparation, planting, thinning; modifications of cutting methods to obtain desired goals and benefits. Prerequisites: 3320.

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

4110-20-30 Problems in Forestry (1-6, 1-6, 1-6, total not more than 9 hrs) Special research or individual problems in forestry.

4210 Forestry Organization and Administration (3) Forestry organization: planning concepts and types of plans; administration; decision making in forest-resource management. Prerequisite: Junior Field Session.

4220 Forest-Resource Management Plans (4) Problems and case studies in forest-resource management; the forest as a system; management of forest enterprises as a producer of timber, recreational services, watershed services, and wildlife; producing multiple services from a forest; management based on optimizing forest uses. Prerequisites: 4210, 1 lab.

4330 Forest Policy (3) The history of forest policy in the United States with emphasis on the development of forest resource policies; current forest-policy management and management of forest resources; brief survey of the policy implications of forest resource organizations in the public and private sectors. Prerequisite: 4004.

*Graduate credit for non-forestry majors only.
4340 Aerial Photography in Forest-Resource Management (3) Use of conventional aerial photographs in forest-resource management; interpretation of detail, aerial inventories, preparation and computer processing of other remotely sensed imagery. Prereq: Civil Engr. 4260 and Forestry 3110 or equivalent. 1 hr and 2 labs.

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

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

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

4630 Seminar (1) Review of literature. Oral and written reports.

5000 Thesis

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

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

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

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

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

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

Wildlife and Fisheries Science

3200 Wildlife Resources and Their Conservation (3) Wild animal resources of the United States; their interrelationships with soil, water, and forests and other plant life; contribution to economic and social development; importance and methods of conserving wildlife. General course for non-wildlife and fisheries science majors.

3320 Wildlife Management (3) (Same as Forestry 3320).

4450 Game Mammals (4) The classification, identification, distribution, natural history, and management principles of game mammals in North America. Prereq: 3320 or 1 year of zoology. 2 hrs and 2 labs.

4460 Game Birds (4) The biology, classification, identification, distribution, and management of game birds in North America. Prereq: 3320 or 1 year of zoology. 2 hrs and 2 labs.

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

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

5000 Thesis

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

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


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

5450 Wildlife Diseases (3) Necropsy of birds and mammals. Recognition of various diseases and methods of controlling them. Prereqs.: Tissues employed in producing cut flower crops. Application of principles of plant physiology as they control flowering, plant quality, and harvest scheduling. Prereq: Greens Management, Crop Physiology, or equivalent. 2 hrs and 1 lab.


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

Ornamental Horticulture and Landscape Design

MAJOR

Ornamental Horticulture and Landscape Design

Professor: J. W. Day, Ph.D. Mississippi State; G. L. McDaniel, Ph.D. Iowa State.

Associate Professors: G. L. McDaniel, Ph.D. Iowa State.

Assistant Professors: J. W. Day, Ph.D. Mississippi State.

3000 Plant Propagation (3) Physiology, methodology, and environmental requirements for propagation. 1 hr and 2 labs.

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

4120 Landscape Design (4) Design and development of properties; planning, organization, structure, selection, and use of plant and structural materials, methods of installation, specification. Prereq: Consent of instructor. 2 hrs and 2 labs.

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

5150-60 Nursery Management I and II (3, 3) Production, labor, and sales management; retail and wholesale nurseries; location, layout, culture, equipment, and facilities. Prereq: 3030. 1 hr and 2 labs.

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

4210 Principles of Turf Management (4) Principles of turfgrass management; history, varietal selection and identification, adaptation, ecology, physiology, soil fertility and grass nutrition; basic applied fertility programs; and weed, disease, insect, and other pest relationships in turf grasses and basic pest control programs. Prereq: Soils and 8 hrs of biological science. 3 hrs and 1 lab.

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

4320 Floriculture II (3) Principles and practices employed in producing floricultural crops in pots and other containers. Analysis of problems associated with using plants in a very restricted soil volume under controlled greenhouse conditions. Prereq: Greens Management, Crop Physiology, or equivalent. 2 hrs and 1 lab.

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

5000 Thesis

5011-21 Special Problems in Lieu of Thesis (3, 3-5)

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

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

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

### Plant and Soil Science

**MAJOR**

**DEGREES**

**Plant & Soil Science**

**M.S., Ph.D.**

**Professors:**

L. F. Scott, Jr. (Head), Ph.D. North Carolina State; F. F. Bell, Ph.D. Iowa State; H. A. Fribourg, Ph.D. Iowa State; L. M. Josephson, Ph.D. Wisconsin; W. L. Parke, Ph.D. Purdue; L. N. Skold, M.S. Kansas State; M. E. Springer, Ph.D. California (Berkeley); H. D. Fisher, M.S. Louisiana State.

**Associate Professors:**


**Assistant Professors:**

F. L. Allen, Ph.D. Minnesota; G. M. Leaman, Ph.D. Michigan State; V. H. Reich, Ph.D. Iowa State.

3020 Crop Ecology (3) Crops and environment; geographic location; site, heat, light, water, and interplant relationships as a basis for judgment of cultural practices used to modify environmental factors. 2 hrs and 1 lab.

3040 Crop Physiology (3) Physiology of crop plants; growth phenomena related to crop production; use of general theories of physiology; effects of season, growth, regulating substances, functions of light, heat, air, minerals and water. 2 hrs and 1 lab.

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

3120 Grain and Oil Crops (3) Distribution, improvement, management, and utilization of corn, small grains, grain sorghum, soybeans and related crops. Prereq: 8 hrs of biological science. 2 hrs and 1 lab.

3140 Forage Crops (4) Characteristics, adaptation, improvement, culture, harvesting, and marketing of forage and legumes. Prereq: 8 hrs of biological science. 3 hrs and 1 lab.

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

3180 Fruit Crops Management (4) Soils, planting, cultivation, development of fruit crops plantations; pest control, harvesting, packing, storage, and pruning. 3 hrs and 1 lab.

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

3250 Soils in Forestry (3) Soils as a medium for tree growth; relation of physical, chemical, and biological properties of soils to tree growth and management of forest stands. Soil properties of importance in road location, recreational development and watershed management. 2 hrs and 1 lab.

3510-20 Commercial Vegetable Production (3, 3) Characteristics, economic importance, adaptability, and production of important vegetable crops for fresh and processing markets. Need not be taken in sequence. 2 hrs and 1 lab.

3610 Interpretation of Agricultural Research (3) Statistics as applied to agriculture. Statistical methods in interpretation of research results.

3710 Principles of Weed Science (4) Basic principles of weed science; history, ecology, economic importance, means of control, types of herbicides, and specific recommendations for various crop and non-crop uses. 3 hrs and 1 lab.

4110 Soil Chemistry (4) Colloidal systems; properties and behavior of colloidal soil materials; relations of chemical properties to plant nutrient availability. 3 hrs and 1 lab.

4120 Principles of Crop Breeding (4) Genetic principles and techniques. Prereq: 1 year of fundamentals of botany or general zoology, or permission of instructor. 3 hrs and 1 lab.

4230 Soil Analysis (3) Analytical techniques used in soil science and soil fertility studies. Prereq: 4110 or concurrent, 2 3-hr labs.

4250 Agricultural Chemicals and the Environment (4) Characteristics, use, mode of action, degradation and environmental impact of chemicals used in agriculture, forestry and related areas with emphasis on agricultural pesticides; environmental safeguards imposed by federal and state regulations on chemical development and use. Prereq: 1 year of biological sciences and 1 year chemistry. 3 hrs and 1 lab.

4320 Soil Formation, Morphology, and Classification (4) Soil formation; properties, distribution, and analysis in relation to soil pedology; classification of soils. Prereq: 4110. 3 hrs and 1 lab.

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

5000 Thesis

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

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

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

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

5250 Pedology (4) Factors and processes of formation and classification of soils; soil genesis; classification of soils. Prereq: 4230 or consent of instructor. 3 hrs and 1 lab.

5310 Design and Interpretation of Experiments (3) Experimental design and procedures; effect of different variables on precision of experiment and problem dealing with the analysis of data. Prereq: 5310.

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

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

5390 Soil Physical Chemistry (3) Structural properties of soil minerals using their physicochemical reactions, ion exchange, Donnan equilibrium, double layer theory. Prereq: 4110; Chemistry 4110 or concurrent registration.

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

5710 Advanced Plant Genetics (3) Importance of polyplody in plants; detailed study of genome relationships, genetic recombination, meiotic behavior, chromosome number and distribution, heritability selection and self-incompatibility systems in relation to genetic principles. Prereq: Basic Genetics or consent of instructor.

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

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

5810 Crop Climatology (4) Meteorological factors affecting growth, development and productivity of crops. Analysis of climatic conditions. Prereq: 5200, 5340, or Botany 3210, 4310 or consent of instructor. 3 hrs and 1 lab.

5820 Advanced Crop Physiology and Ecology (4) Historical development of research in crop physiology and ecology. Interrelationships between physiological processes and environmental factors. Crop adaptation to specific environmental conditions. Prereq: 5200, 5340, or Botany 3210, 4310 or consent of instructor. 3 hrs and 1 lab.

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

6000 Doctoral Research and Dissertation

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

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

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

6340 Advanced Soil Physics (3) A theoretical consideration of the soil as a physical body. Physical characteristics of soils and principles underlying moisture, gas, and heat flow potentials in soils. Prereq: 5340, Chemistry 4110, Mathematical Analysis.

6390 Advanced Soil Physical Chemistry (3) Electropotential properties of colloidal systems, including electrical potentials of soil minerals, and their relationship to mineral nutrition of plants. Prereq: 5380 and Chemistry 3430.

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

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

6600 Seminar (1) May be repeated. Maximum 3 hrs.
Graduate programs of the College of Business Administration are designed to prepare men and women to assume executive, managerial and professional positions in the increasingly complex world of domestic and international business and industry, teaching and research, government, and institutional management.

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

Graduate Programs

The College of Business Administration offers programs leading to six advanced degrees: the Doctor of Business Administration, the Doctor of Philosophy in Economics and in Management Science, the Master of Arts and the Master of Arts in College Teaching with a major in Economics, the Master of Science in Economics, Management Science and Statistics, and the Master of Business Administration. See page 8 for areas of study. Also, the Department of Industrial and Personnel Management participates with the Department of Psychology in the College of Liberal Arts in offering an inter-collegiate program in Industrial and Organizational Psychology leading to the Master of Science and Doctor of Philosophy degrees. (See page 93.)

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

THE MBA PROGRAM

The College-wide curriculum of the Master of Business Administration program is designed to prepare students for successful careers in business and institutional management and for imaginative and responsible citizenship and leadership roles in business and society. The program is designed to encompass the major functional areas of business and economics in order to provide the perspective necessary for those who aspire to positions of executive and professional leadership. The curriculum reflects the application of evolving knowledge in economics and the behavioral and quantitative sciences. This program is accredited by the American Assembly of Collegiate Schools of Business.

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

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

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

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

All entering students must have completed college-level mathematics through at least one quarter (or semester) of calculus or remove the deficiency by taking appropriate courses in mathematics. Specific requirements of the MBA program are shown below.

To qualify for the degree, a student must complete a minimum of 51 quarter hours of graduate course work in Groups B, C, and D.

Group A—Foundation Courses. Required for students who lack adequate preparation in the areas listed. Any or all
of these courses may be waived if the student has completed undergraduate course equivalents. Additional prerequisite courses may be required for certain concentration areas. These courses are available only to satisfy Group A requirements and as stated on page 64.

Quarter Hours

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

Group B—Core for all Candidates

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acctg. 5810, Accounting for Control</td>
<td>3</td>
</tr>
<tr>
<td>Econ. 5070-80, The Firm and Its Environment</td>
<td>6</td>
</tr>
</tbody>
</table>

Group C—Concentration. At least 12 but not in excess of 18 quarter hours of graduate level courses are required in one area of concentration. To the extent that the concentration area is decreased below 18 hours, Group D—Electives is increased. A student may elect two areas of concentration of 12 quarter hours each, in which case no courses are required in Group D—Electives. (All double concentration programs should be coordinated through the Graduate Programs Office of the College of Business Administration.)

Total, Group C: 12-18

MBA CONCENTRATIONS: Typical course groupings are listed below. Area prerequisites may be taken in one's undergraduate program or included in the MBA curriculum prior to undertaking courses in the concentration area.

Accounting. Graduates are eligible for the CPA examination in Tennessee. Area prereq.: Introductory Financial Accounting (6); Introductory Cost Accounting (6); Intermediate Theory (9); and Federal Income Tax (3).

The following areas must be included in the concentration unless taken in undergraduate program: Auditing, Consolidations, Advanced Federal Income Tax, and Computer Concepts in Accounting. Additionally, at least three of the following must be included: 5110, 5120, 5130, 5210, and 5420.

Economics. (See also Masters and Ph.D. programs in this area.) Area prereq.: Intermediate Macro- and Micro-Economic Theory (6).

Any combination of 12-18 quarter hours of Economics courses listed in this catalog as approved by the faculty advisor.

Finance. Area prereq.: Finance 5050 or equivalent; 5110 (core course). A minimum of three courses must be taken in one of the following areas:

- Financial Management: 5120, 5130, 5140, 5620, 5800, 5990
- Investments: 5420, 5430, 5810
- Monetary and Fiscal Policy: 5210, 5220, 5320, 5810, 5820, 5830

Governmental Financial Administration.

Area prereq.: none.

Management 5210, 5220, 5230, 5240

Accounting 5510

Political Science 5740

Industrial Management. Area prereq.: Industrial Management 5050 or equivalent (for 5410 only).

Management, planning and control: 5110, 5120, 5130

Personnel Management: 5210, 5220, 5230 (core course), 5240

Production Management: 5410, 5420, 5430

Management of Industrial Research: 5390

Management of Foreign Operations: 5710

Management Science. (See also Master of Science and Ph.D. degree programs in this area.) Area prereq.: Mathematics through second year of calculus including differential equations. Any combination of 12-18 quarter hours of Statistics courses listed in this catalog as approved by the faculty advisor.

Transportation and Logistics. Area prereq.: Transportation 5050 or equivalent. Any combination of 12-18 quarter hours of Transportation courses listed in this catalog as approved by the faculty advisor. Transportation 5210 normally is required.

Group D—Electives. Unless the student elects two areas of concentration, a minimum of six but not in excess of 12 quarter hours of graduate level course work may be taken in any of the colleges of the University subject to approval of the student's faculty advisor.

Total, Group D: 6-12

Total Program (except Group A): 51

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

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

THE DBA PROGRAM

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

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

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

I. Course Work

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acct. 5810 Accounting for Control</td>
<td>3</td>
</tr>
<tr>
<td>Acct. 5820 Corp. Reporting Prob.</td>
<td>3</td>
</tr>
<tr>
<td>Econ. 5111-12 Microecon. Theory (3.3)</td>
<td>9</td>
</tr>
<tr>
<td>Econ. 5121 Macroecon. Theory (3)</td>
<td>3</td>
</tr>
<tr>
<td>Econ. 5111 Microecon. Theory (3)</td>
<td>3</td>
</tr>
<tr>
<td>Fin. 5110 Theory of Financial Mgt.</td>
<td>3</td>
</tr>
<tr>
<td>Ind. Mgt. 5110 Organizational Theory</td>
<td>3</td>
</tr>
<tr>
<td>Ind. Mgt. 5610-20 Organizational Behavior</td>
<td>6</td>
</tr>
<tr>
<td>Mktg. 5200 Marketing Management</td>
<td>3</td>
</tr>
<tr>
<td>Mgt. Sci. 5100 Mgt. Science Techniques</td>
<td>3</td>
</tr>
<tr>
<td>Stat. 5311 Probability Theory</td>
<td>3</td>
</tr>
<tr>
<td>Stat. 5312 Statistical Methods</td>
<td>3</td>
</tr>
<tr>
<td>Trans. 5210 Business Logistics</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Core</strong></td>
<td><strong>42</strong></td>
</tr>
</tbody>
</table>

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

B. CONCENTRATION AREA. This is the focal point of the program and the area in which the student expects to do his/her research and dissertation. A minimum of 15 quarter hours (including at least 9 quarter hours of doctoral-level work taken at The University of Tennessee, Knoxville) is taken in one of the following areas:

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

C. SUPPORTING AREA (minimum of 12 quarter hours). The purpose of this work is to expand the student's understanding of business beyond the area of concentration and to complement the dissertation research effort. The chosen area should have a clear relationship to the concentration and serve to strengthen the student's overall capacity to do scholarly work in specific areas of research interest within his concentration. The area may be selected from those offered within the College of Business Administration or in other fields within the University, including but not limited to mathematics, engineering, communications, public administration and political science, history, philosophy, psychology, sociology, law, and other relevant areas.

D. OPTIONAL AREA (Minimum of 12 quarter hours). The student has the option of choosing either behavioral science or quantitative methods as an area in which to gain proficiency beyond work completed in the core. Requirements for this area are as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral Science</td>
<td></td>
</tr>
<tr>
<td>Ind. Mgt. 6250-60-70 Seminar in Ind. and Org. Pay. (select two courses)</td>
<td>6</td>
</tr>
<tr>
<td>Electives in Behavioral Science (6000 level)</td>
<td>6</td>
</tr>
</tbody>
</table>
| Quantitative Methods. Select one of the following two options with substitution of core quantitative courses as indicated:

1. (Core: Stat. 5050, 5060; Mgt. Sci. 5100) | |
| Statist 5070, 6060, 6070 | 9 |
| Elective in statistics, mathematics, management science or computer science | 3 |

2. (Core: Stat. 5311 or 5310, 5312) | |

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Adm. 6900 Res. Meth. In Business</td>
<td>3</td>
</tr>
<tr>
<td>Business Adm. 5900 Academic Practicum</td>
<td>3</td>
</tr>
</tbody>
</table>

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

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

Admission Requirements

General admission requirements for the Graduate School are stated on pages 11-12. MBA and DBA applicants are required to take the Graduate Management Admission Test (GMAT). Applicants for programs in Economics, Management Science, and Statistics may submit results of either the GMAT or the Graduate Record Examination (GRE) including both the aptitude and advanced tests. Applicants for Management Science must score a minimum of 500 on the GMAT and meet the quantitative methods prerequisites stated in the program description.

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

In addition to procedures required for admission to the Graduate School (pp. 11-12), DBA applicants must submit additional information on forms provided by the College of Business Administration. The application for all programs and supporting materials should be submitted.
at least three months prior to desired entry date.

The College of Business Administration is associated with other leading graduate schools of business as a member of the Admission Council for Graduate Study in Management.

Fellowships and Assistantships

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

Assistantships. A limited number of graduate assistantships are available in each of the academic departments and in the Center for Business and Economic Research. Assistantships which carry remission of tuition and/or fees range up to $4500 per year, while others funded through various research centers of the University range up to $5500 per year for half-time service. Awards are generally made on the basis of scholarship and performance on the admission test. Application forms may be obtained in any of the departments or from the office of the Assistant Dean for Graduate Programs. Applications must be received by April 1 for consideration of assistantships to be awarded for the following fall term.

Center for Business and Economic Research

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

Tennessee Executive Development Program

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

The TEDP limits enrollment to 32 participants who live on campus for a total of four weeks spread over a three-month period. This arrangement provides executives with extensive opportunities to exchange ideas and operational concepts with contemporaries in other business areas and with TEDP faculty as well.

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

Department of Instruction

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

Accounting

MAJOR DEGREES

Accounting M.B.A., D.B.A.

Professors: N. E. Dittrich (Head), Ph.D. Ohio State, C.P.A.; J. B. Ross, Ph.D. Alabama, C.P.A.


4110 Theory and Practice of Auditing (3) Theory and practice of professional and general auditing. A cooperative program is maintained with national and local public accounting firms for selected students who spend winter quarter working on staffs of these firms. Prereq: Intermediate Accounting.

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


4950 Individual Research in Accounting (3) Special projects undertaken by majors in accounting under the direction of faculty members of professional rank.

4990 Seminar in Accounting Theory (3) Advanced problems in the financial accounting area are analyzed and discussed by students.

5000 Thesis

5050-60 Introduction to Financial Accounting (3, 3) Classification and presentation of financial data, basic accounting concepts underlying asset valuation and income measurement, interpretation of financial statements. (Available only as stated on page 33.)

5110 Seminar in Accounting Theory (3) Accounting postulates, principles, and procedures. Concepts of value as they relate to the measurement of performance and position. Prereq: Two quarters of intermediate accounting or equivalent.

5120 Seminar in Advanced Auditing (3) Standards and procedures in audits and special investigations; audit reports and reports filed with the S.E.C. Auditing EDP systems and use of statistical techniques emphasized. Prereq: Theory and Practice of Auditing or equivalent.

5130 Seminar in Current Accounting Topics (3) Current controversial issues in financial accounting and reporting. Prereq: Two quarters of intermediate accounting or equivalent.

5210 Seminar in Advanced Cost Accounting (3) Direct costing, return on investment, capital budgeting, cost of capital analysis, distribution costs, cost justification under the Robinson Patman Act, and others. Prereq: Second quarter of Introductory Cost Accounting or equivalent.

5420 Seminar in Advanced Taxation (3) Income determination, tax planning and organization of the Internal Revenue Service, administrative settlements in tax disputes. Prereq: Theory and Practice of Auditing or equivalent.

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

5530 Accounting Systems and EDP Concepts and Control (3) Elements and operation of a computer in a business environment. The analysis, design, implementation, documentation, and control of accounting systems. Prereq: Introduction to Computer Concepts and knowledge of a computer programming language.

5640 Seminar in Management Information Systems
Economics

MAJOR

DEGREES

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

Professors:

R. J. Moore (Head), Ph.D. Cornell; R. L.

Bouwhui, Ph.D. Texas; W. E. Cole, Ph.D. Texas; G. R. Feiwel, Ph.D. McGill; J. F. Holly, Ph.D.

Clerk; H. E. Jensen, Ph.D. Texas; F. Y. Lee,


E. S. Wolf, Ph.D. Vanderbilt.

Associate Professors:

S. L. Carroll, Ph.D. Harvard; C. B. Garrison,

Ph.D. Kentucky, E. Griliches, Ph.D. Stanford; H. R. Granade, Ph.D. Florida; R. Mayhew,

Ph.D. Texas; D. A. Patterson, D.B.A. Indiana; K.

E. Phillips, Ph.D. Washington (Seattle); G. A.

Spiva, Ph.D. Texas.

Assistant Professors:

H. S. Chang, Ph.D. Vanderbilt; R. J. Gaston,

Ph.D. California (Los Angeles); H. W. Herzog,

Ph.D. Maryland; A. M. Schloer,Ph.D. Washington

(St. Louis); G. Vaugn, Ph.D. Duke; K. I.

Vaugn, Ph.D. Duke.

MASTER'S PROGRAM

The minimum requirements for a graduate major in Economics for the Master of Arts and the Master of Science degrees consist of the following: (1) Economics 5111-5112 and Economics 5121-5122, (2) nine additional hours in economics at the 4000 or above level, (3) a thesis, or an additional nine hours in economics at the 5000 level or above to be concentrated in one field. Students electing the non-thesis option will be required to pass a final written comprehensive examination.

The requirements for a graduate minor in Economics are as follows: Either (1) 5111-12 and 5121-22, or (2) 5111 and 5121-22, or (3) 5111 or 5112, 5140, and one other 4000 or 5000 series economics course, or (4) with the consent of the head of the Economics Department, an alternative sequence of nine hours to meet unusual conditions.

MASTER OF ARTS IN COLLEGE TEACHING DEGREE

The requirements for the MACT degree are listed on page 17. A thesis is required.

DOCTORAL PROGRAM

Subject Area Requirements.

1. Students will be required to demonstrate their competence in the core subject fields as indicated:


b. Economic History, by completing six hours in Economic History at the 6000 level or above with an average grade of B or better by satisfying an examining committee.

2. Students will be required to demonstrate their competence by preliminary examination in three fields with the approval of the department, at least two of which must be selected from the following list and only one of which may be from the first three fields listed:

Advanced Economic Theory

Economic History

History of Economic Thought

Economic Development

Economics of Central and Planned Economies

Economics of Labor and Manpower

Industrial Organization

International Economics

Regional and Urban Economics

Agricultural Economics

Monetary Economics

Public Finance and Fiscal Policy

Fields, as offered by the department, combining two or three of the above fields (in some cases, a combined field may "count" as two fields.)

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

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

5000 Thesis

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

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

6000 Doctoral Research and Dissertation

ECONOMIC THEORY

4110 Managerial Economics (3) Application of economic theory to business decision making; emphasis on profit objectives, measurement and forecasting demand and costs, and capital budgeting. (Same as Water Resources Development 4110.)

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

4150 History of Economic Thought (3) A review of the development of economic thought, tools of analysis, and economics as a social science, together with an analysis of the social-economic conditions which influenced this development. Period covered: 1776 through 1936. Prereq: 1 yr of Principles of Economics and consent of instructor.

4170-30 Introduction to Mathematical Economics (3) Application of mathematical methods in the theoretical study of micro- and macroeconomic phenomena. Designed for be-
gaining graduate students who have limited training in analytic geometry and calculus. Must be taken in sequence. Prereq: Intermediate Micro Theory and college algebra, calculus, and analytic geometry or the equivalent.

505 Introduction to Economic Analysis (3)
The nature of economic problems; economics as a science; brief survey of the evolution of economics; analytical tools of macro- and microeconomics. (Available only as stated on page 33.)

506 Introduction to Economic Problems and Policies (3) Economic theory as a basis for problem solving; tools of public and private policy making for the stability, growth and minimum income, international economic relations and the problems of the developing economies. (Available only as stated on page 33.)

5070-80 The Firm and Its Environment (3, 3) Macroeconomic environment; economic forecasting; microeconomic environment; organizational analysis; behavioral aspects of imperfect markets; legal aspects of imperfect markets; responsibilities of the businessman. Must be taken in sequence. Prereq: 5050-60.

5111-12 Microeconomic Theory (3, 3) Fundamental theory of price determination in partial and general equilibrium settings, including theory of preferences and consumer behavior, production, short and long-run profit maximization under conditions of perfect and imperfect competition, theory of production and distribution. Prereq: 4170 and Intermediate Economic Theory or equivalent.

5121-22 Macroeconomic Theory (3, 3) Determination of the levels of employment and prices for the economy as a whole, focusing on the relationships between interest rates, price expectations, productivity, and the quantity of money, on the one hand, and aggregate saving, investment, and liquidity preference on the other. Prereq: Intermediate Economic Theory or equivalent.

5150 History of Economic Thought (3) Development of economic ideas from the mercantilists through Alfred Marshall; emphasis given to current economic problems. Prereq: Introductory course in microeconomic theory.

5121 Seminar in Advanced Macroeconomic Theory (3) Topics in macroeconomic theory. May be repeated for credit with permission of the department. Prereq: 5121, 5122 and consent of the instructor.

5150-60 History of Economic Doctrines (3, 3) Important ideas of economic thinkers from the Middle Ages to the present. Prereq: 5150-60 History of Economic Thought, 5121 or 5122.

5170-80-90 Econometric Methods (3, 3, 3) Theory and techniques of statistical testing of economic hypotheses and construction and estimation of econometric models. Review of the classical least squares regression model and extensions of the least squares regression model, and approaches to simultaneous equations by means of econometric research. Prereq: 5180-90 and 5510 or the equivalent.

INTERNATIONAL TRADE AND ECONOMIC DEVELOPMENT

4230 Problems in International Trade and Economics (3, 3) Determination of or problems of areas of current importance in the fields both of international economics and economic development.

4240 Economic Development of the United States (3, 3) The development in agriculture, industry, communications, transportation, banking, and trade and of changes in governmental economic policy.

4250 Economic Development of Europe (3) The beginnings of capitalism in medieval Europe, the expansion of Europe and the dominance of mercantilism in early modern times, the mechanization of industry; changes in agricultural organization, and growing importance of commerce in the nineteenth century; two world wars and their economic consequences.

4260 Economics of Resources (3) Descriptions, needs and allocation of resources. Benefits and costs of development and use of resources in industrial society.

5210-20 Seminar in International Trade and Economic Development (3, 3) Study of areas such as the theory of international trade, the theory of economic growth, commercial policy, and international trade policy.


5510 Location and Regional Development Theory (3) Theory of industrial, agricultural, and business location. Basic theory of regional interaction and development.

5620 Regional and Interregional Social Accounting (3) Income and product, money flows, input-output, and balance of payments accounts for localities, states, regions, and nations.

6211-12, 6221-22 Seminar in International Economics (3, 3, 3, 3) Theory of specialization and international trade, international payments, exchange rates, monetary problems, capital movements, and foreign trade policy.

6231-32, 6241-42 Seminar in Economic Development (3, 3, 3, 3) Development and application of analytical tools to problems of economic policy faced by developing regions and countries.

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

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

6270 Seminar in the Economic History of the Third World (3) Selected topics in the economic history of developing countries of Asia, Africa, Latin America, and the Middle East, or the economic history of the Spanish-speaking or Portuguese-speaking countries of South America.

6610 Seminar in Regional Analysis (3) Topics in location theory, interregional linear programming, transportation, models, gravity and potential models. Prereq: 5610-20. Coreq: 5190.

INDUSTRIAL ORGANIZATION

4300 Government and Business (3) Regulatory problems such as business and practices, disclosure, and consumer protection; patent policy, legalized concertation; public enterprise as a substitute for private enterprise; government-business relations. Prereq: An Introductory course in business-government relations.

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

5340 Seminar in Private Enterprise and Public Policy (3) The structure of contemporary industry, factors in its development, and consequences for business conduct and performance; social control of business through antitrust and other government regulation.

6351-52, 6351-52 Seminar in International Organization (3, 3, 3, 3) 6351-52-Survey of the development of international economic, with emphasis on the empirical and analytical techniques used in investigating international conduct and performance, 6351-52—Public Policy in the United States with respect to industrial structure and business conduct—examination, appraisal and proposals for change.

ECONOMICS OF CENTRARLY PLANNED ECONOMIES

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

6331 Theory and Practice of Economic Planning (3) Major economic development in the Soviet Union and China; indicative planning. Prereq: Consent of instructor. May be repeated with consent of department.

ECONOMICS OF LABOR AND MANPOWER

4420 Manpower Problems and Policy (3) Analysis of current manpower problems and an examination of possible solutions, emphasis on theoretical basis for studying manpower problems. Prereq: Principles of Labor Economics.

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

4470 Collective Bargaining in the Private Sector (3) Organization of labor and management for collective bargaining, subject matter for collective bargaining, and collective bargaining law. May be repeated with consent of department with the approval of the department. Prereq: Principles of Labor Economics (6 hrs or equivalent).

5410 Seminar in Wage Determination (3) Wage theories and policies; emphasis on wage
determination under collective bargaining. Prereq: Consent of instructor.

5420 Seminar in Labor Economics (3) Problems created by the presence of organized labor movement in the American economy. Prereq: 5410.

6411-12, 6421-22 Seminar in Labor Economics (3, 3, 3, 3) Selected labor problems chosen for their current interest of continuing significance. Development and application of problems and techniques.

### Finance

**MAJOR**
- **DEGREES**
  - M.B.A.
  - D.B.A.

**Finance**

Governmental Financial Administration M.B.A.

Real Estate and Urban Development M.B.A.

**Professors:**

**Associate Professors:**

**Assistant Professors:**
- A. L. Auxier, Ph.D. Iowa; H. S. Banton, M.S. Auburn; W. C. Groolby, Ph.D. Wisconsin Milwaukee; Mary Lindahl, Ph.D. Illinois Champaign-Urbana; R. E. Shrieves, Ph.D. California (Los Angeles); R. A. Weir, Ph.D. North Carolina.

**5000 Thesis**

**6000 Doctoral Research and Dissertation**

**FINANCE AND INVESTMENTS**

5050 Survey of Finance Functions in Business (3) The scope and nature of managerial finance: financial analysis, planning and control; financial investment decisions; financial structure and the cost of capital; internal and external long-term financing; and working capital management. Prereq: Principles of economics and fundamental accounting. (Available only as stated on page 33.)

5110 Theory of Financial Management (3) Financial decision making in the firm with the objective of maximizing shareholder wealth. Decision areas include the investment, capital costs and the financing decision, and the dividend decision of the firm. Prereq: 5050. Coreq: Probability theory.

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

5130 Financial Administration (3) Cases and readings within the firm: refined techniques of analysis; optimal financing decisions; cash management; valuation of capital market instruments; general corporate financial theory. Prereq: 5110.

5140 Seminar: Managerial Finance (3) Applications of theory and quantitative techniques to the solution of current problems in managerial finance. Prereq: 5120, 5130.

5200 Executive-In-Residence Seminar for M.B.A. (3) This course develops the practical aspects of financial management and investments. Leading industry, banking, and government personnel involved with finance in the class. Prereq: Consent of the department.

5990 Research in Finance (3) Directed research on a topic of mutual interest to the student and staff member. May be repeated. Maximum 6 hrs. Prereq: 5110.


5620 Theory of Finance (3) The theory of financial decision making under conditions of certainty and uncertainty. The application of the theory of choice to the allocation of financial resources over time with reference to financing decisions, investment decisions, and the determinants of the cost of capital.

### MONETARY POLICY AND FINANCIAL INSTITUTIONS

**5810 Financial Markets and Intermediaries (3)** A study of capital formation and the allocation of capital in both the U.S. economy and abroad. The analysis covers the process of saving, the partial institutionalization of these savings, the investment in financial intermediaries, the efficiency of the allocation process and its effect on the economy, and the impact of financial institutions on financial markets. (Same as Economics 5810.)

5820 Monetary Theory and Policy (3) A survey of the relationship of money, credit and liquidity to income, interest rates, employment and prices as well as examination of the effect of monetary policy on economic activity. Prereq: Economics 5800 or equivalent. (Same as Economics 5820.)

5830 Commercial Bank Management (3) Bank management decision-making analysis of changes in banking environment and structure; acquisition and management of funds; current banking problems. Prereq: Consent of instructor. (Same as Economics 5830.)

6110-20 Seminar: Monetary Theory (3, 3) Study of money, credit, and liquidity as related to income, interest rates, employment, output, and prices.

6310-20 Seminar: Monetary and Fiscal Policy (3, 3) Study of goals and effectiveness of monetary and fiscal policy. Critical evaluation of impact of monetary and fiscal policy upon economic stability, employment, prices, and national income.

### GOVERNMENTAL FINANCIAL ADMINISTRATION

5210-20 Public Finance (3, 3) Role of the public sector and the problem of social balance, collective and quasicollective goods and their financing under alternative tax programs. Must be taken in sequence. Prereq: Economics 5800 or equivalent.


### INSURANCE

5110 Theory of Risk Management (3) For students with no background in risk and insurance. Study of the theory of risk management and of manageable risks facing the individual and the firm. Analysis of risk management techniques with emphasis on insurance as a tool.

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

### REAL ESTATE AND URBAN DEVELOPMENT

4900 Aspects of Urban Environment I (3) An interdisciplinary analysis of urban policy. Prereq: Consent of instructor. (Same as Psychology 4900, Architecture 4900, Political Science 4900.)


5120 Real Estate Analysis (3) Analysis of real property investment, real estate finance and appraisal theory. Prereq: Finance 5050 or equivalent.

5130 Housing and Urban Land Markets (3) Analysis of housing demand, supply and location. Segregation and housing discrimination. Impact of urban renewal and public policy on housing markets. Prereq: 5110 or consent of instructor.

5140 Real Estate Investment and Taxation Analysis (3) Analysis of economic factors and institutions which underlie real estate investment decision making. Case method is utilized. Prereq: 5120 or consent of instructor.

### Industrial and Personnel Management

**MAJORS**

**DEGREES**
- M.B.A.
- D.B.A.

**Industrial Management**

**Management**

**Personnel Management**

**Professors:**

**Associate Professors:**
- R. D. Arvey, Ph.D. Minnesota; F. A. Chamblin, M.B.A. Indiana; H. D. Dewhirst, Ph.D. Texas; M. Gordon, Ph.D. California; R. C. Maddox, Ph.D. Texas; C. W. Neel, Ph.D. Alabama.

**Assistant Professors:**
- J. A. Bachmann, Ph.D. Virginia Polytechnic Institute; R. L. Dieboyse, Ph.D. Purdue; O. S. Fowler, Ph.D. Georgia; W. Henderson, Ph.D. Purdue.

**4801-02 Research and Reading in Personnel Management (1, 2, 3) Prereq: Personnel Administration, Statistics 4310. and consent of instructor.**

**5000 Thesis**

**5500 Production Management (3) Analysis of the production function with emphasis upon application of mathematical-statistical methods.**

1. William B. Stokely, Professor of Management.
2. Alumni Distinguished Service Professor.
Management Science

MAJOR

DEGREES

Management Science M.S., M.B.A., Ph.D.

Associate Professors:
C. E. Bell (Chairman), Ph.D. Yale;
R. S. Garlinkel, Ph.D. Johns Hopkins.

Assistant Professors:
R. E. Roseenthal, Ph.D. Georgia Institute of Technology

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

MASTER OF SCIENCE PROGRAM

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

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

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

**Course Requirements**

- **Quarter Hours**
- **Management Science 5310-20-30-40** 12
- **Applied Concentration Area** (approved by advisor) 12
- **Statistics 5110** 3
- **Statistics elective (5000-level or above)** 3
- **Mathematics (4000-level or above)** 6
- **Electives selected from mathematics, statistics, computer science, and/or management science** 6
- **Electives in any area approved by advisor** 6

**Total** 48

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

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

**MBA CONCENTRATION**

Management Science 5310-20-30 forms the nucleus of a 12 to 18 hour concentration in Management Science for MBA students. See pages 32-33 for further MBA details.

**DOCTORAL PROGRAM**

The Ph.D. program in Management Science is designed to prepare students for meaningful research in the development of quantitative concepts and methods for solutions to management problems. A candidate for the degree is expected to achieve a doctoral level of understanding of the current state of development of quantitative methods and to undertake graduate study in the course of the student’s own research. Details of the program are available from the student’s advisor and/or management science department.

To undertake graduate study in certain mathematics related business areas, the student may (with the approval of the Management Science Committee) select courses and electives from the third year to full-time research. The prerequisites are the same as for the Master’s program.

**Coursework and Research**

A minimum of 72 quarter hours of formal coursework (not to include the Master’s thesis) is required for graduate credit, of which at least 36 hours must be completed at The University of Tennessee, are required. Students’ programs will consist of basic and advanced courses in mathematics, statistics, com-

(For M.B.A. students only. Available only as stated on page 33.)

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

**5120 Organization Theory II (3)** Dynamics of organization, leadership, motivation, informal organization. Prereq: 5110.

**5130 Managerial Planning and Control (3)** Processes of management planning and controlling, with emphasis on long-range corporate planning.

**5170-80-90 Seminar in Industrial and Organizational Psychology (3, 3, 3)** Introduction to the basic concepts and ideas required for graduate study in industrial and organizational psychology. Must be taken in sequence during the student’s first year. (Same as Psychology 5170-80-90.)

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

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

**5230 Human Problems in Administration (3)** Readings and criticism of research in human relations. (Same as Psychology 5450.)

**5240 Personnel Research Seminar (3)** Review of research in personnel administration; development of experimental design. Prereq: 5210-20-30. (Same as Psychology 5460.)

**5250-60-70 Industrial and Organizational Psychology (1-3, 1-3, 1-3)** Reading in Industrial and Organizational Psychology. Prereq: Consent of instructor. S/NC or letter grade.

**5320 Management Problems in Industrial Research (3)** Basic administrative problems encountered in the management of industrial technological research and engineering programs, and comparable programs in which professional personnel predominate.

**5410-20-30 Production Management (3, 3, 3)** A quantitative approach to the solution of production management problems. Prereq: 36 hrs of mathematics and statistics, including 3 hrs of computer programming, or equivalent and consent of instructor.

**5610-20 Organizational Behavior (3, 3)** An examination of behavioral methodology and perspective, including a review of empirical behavioral research in organizations. Must be taken in sequence.

**5640 Seminar in Management Information Systems (3)** (Same as Accounting 5640.)

**5710 Management of Foreign Operations (3)** Analysis of operational environment of international business firms and impact of internal and external factors on managerial decisions. Readings and cases will be used.

**6000 Doctoral Research and Dissertation**

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

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

**6130 Seminar in Contemporary Management Issues (3)** An examination of contemporary management policy issues. May be repeated.

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

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

**6900 Field Work in Industrial and Organizational Psychology (1-15)** Supervised practice. One credit for each 30 hours of such practice. Maximum 15 credits. (Same as Psychology 6900.)

College of Business Administration 39
computer science, and management science, and will also include a business concentration. At least 36 quarter hours of credit must be earned in Management Science courses numbered above 6000. In addition to the above, students must earn at least 36 quarter hours credit at the 6000 level for an acceptable dissertation in a management science related area. The academic program and research area of each student must be approved by the Management Science Committee and by the Vice Chancellor for Graduate Studies and Research.

Qualifying Examinations

Written qualifying examinations taken normally at the end of the first year of graduate study cover the basic quantitative areas of advanced calculus, matrix algebra, computer methods, probability theory, and statistical inference. Students must pass the qualifying examinations prior to enrolling in Management Science courses numbered 6000 and above.

Preliminary Examination

Students will be required to demonstrate their competence in management science theory and methodology by satisfactory performance on a written preliminary examination to be taken normally after the second year of graduate study.

Business Concentration

Students will be required to have an approved business concentration consisting of a minimum of 21 hours of coursework, at least nine hours of which must be in Management Science courses numbered above 6000. Students without prior equivalent education in business will, in addition, be required to take Economics 5050-90 and at least one course in Accounting.

Admission to Candidacy

A student's doctoral committee may recommend his admission to candidacy if he has an overall grade point average of 3.00 or higher and has satisfactorily completed:

- a. majority of his coursework requirements,
- b. the qualifying examinations,
- c. the preliminary examination.

Final Oral Examination

After the student completes a formal program of coursework and research, he/she must pass a final oral examination. The candidate's doctoral committee will evaluate the student's performance on this examination. The final oral examination is open to any member of the University faculty.

5000 Thesis

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


5340 Application of Management Science Methods (3) Application of one or more of the methods from 5310-20-30 to a large-scale management problem.

5510 Optimization Theory and Techniques (3) Differentiation of matrices and vectors; extreme point solutions to vector functions; optimization of linear and quadratic functions subject to constraints; optimum search techniques. Prereq: 5340, Mathematics 4150.


5620 Queuing Theory (3) A study of queuing theory and its application to network process models and other models where the interarrival or service time distributions, or both, are non-exponential. Use of Markov chain theory to develop useful statistics for networks of queues. Prereq: 5340, Statistics 5110, 5210.

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


6000 Doctoral Research and Dissertation

6110-20-30 Models for Production Systems (3, 3, 3) A study of existing models of production systems related to such areas as machine assignment, line balancing, job sequencing, inventory policies, etc. with the objective of extending existing models and developing new models. Prereq: 5340 and 9 hours of Statistics at 5000-level or above.

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


Marketing and Transportation

MAJORS

Marketing

DEGREES

M.B.A., D.B.A.

Transportation and Logistics

M.B.A., D.B.A.

G. N. Dicer (Head), D.B.A. Indiana

Marketing

Professors:


Associate Professors:


Assistant Professors:

D. J. Barnaby, Ph.D. Purdue; E. R. Cadotte, Ph.D. Ohio State; R. A. Robicheaux, Ph.D. Louisiana State; G. D. Sennit, D.B.A. Indiana; R. D. Tamils, M.B.A. McGill.

1 Alcoa Foundation Professor in Business Administration.

5000 Thesis

5050 Survey of Marketing (3) Analysis of the marketing structure, institutions, functions, and marketing problems. Current trends and developments. (Available only as stated on page 33.)

5200 Marketing Management (3) Management of the basic marketing functions. Case problems and marketing decision simulation. Prereq: 5050 or equivalent.

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

5300 Analysis and Design of Marketing Systems (3) A macroinstitutional approach to the marketing system. Conceptual framework for examining marketing agency and channel interrelationships, public policy, cost and efficiency, and innovation in marketing from the viewpoint of the decision maker. Prereq: 5200 or equivalent.

5300 Research Marketing (3) Investigation and solution of problems; application of research methods to functional areas of marketing. Research concepts, methods, and techniques. Prereq: Statistics 5110 or equivalent.

5310 Quantitative Techniques in Marketing Analysis (3) Application of quantitative techniques to marketing problems. Models for decision making and strategy formulation. Prereq: 5050.

5350 Buyer Behavior Analysis for Marketing (3) Buyer behavior processes with emphasis on the implications for marketing analysis and executive action. Marketing and the behavioral sciences. Prereq: 5200 or equivalent.

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

5450 International Marketing Management (3) Development and management of international marketing programs. Problems involved in marketing goods and services in foreign markets. Political, cultural, and economic conditions in different countries. Prereq: 5200 or equivalent.

5990 Research in Marketing (3) Directed research on a subject of mutual interest to student and staff member. Prereq: 5200 and 5300.

6000 Doctoral Research and Dissertation

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

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

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

Transportation and Logistics

Professors:

Office Administration

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


4310 Business Letter Writing (3) Modern business letters; types of letters studied; principles applied by solving letterwriting problems.


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

4517-67 Work Simplification (3) Work simplification; cost control and reduction; development of standards; use and preparation of office manuals. Prereq: Office Equipment Problems, 4320 or consent of instructor.

4551-61 System Analysis (3) Principles and techniques of linear regression and correlation, analysis of variance; introduction to linear regression. Prereq: Second quarter of calculus and analytic geometry.

4554-64 Non-Parametric Methods (3) Measures of association, two-sample tests, analysis of variance with ranked data; paired and multiple tests of significance; introduction to linear regression. Prereq: Third quarter of calculus and analytic geometry.

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

5011 Problems in Lieu of Thesis (3)

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

Statistics

MAJOR

Statistics

M.S., M.B.A.

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

DEGREES

Statistics

M.S., M.B.A.

4100 Principles of Introduction to Statistical Analysis

4150 Sampling Methods (3) An introductory treatment of the basic ideas of scientific sampling. Prereq: consent of instructor.

4250 Non-Parametric Methods (3) Measures of association, two-sample tests, analysis of variance with ranked data; paired and multiple comparisons in preference testing; questionnaire evaluation. Prereq: Introduction to Statistical Analysis.

4310 Regression and Correlation (3) Techniques of linear regression and correlation, polynomial and multiple regression, and partial correlation. Prereq: Second quarter of Introduction to Statistical Analysis or 3450.

4410 Design of Experiments (3) Principles and procedures for efficient experimental design. Prereq: Consent of instructor.

5000 Thesis

5050-60-70 Statistical Analysis for the Behavioral Sciences (3, 3, 3) 5050—Probability distributions, sampling distributions, estimation and hypothesis testing. Parametric and non-

5110 Introduction to Probability Theory (3)
Classical probability and distribution theory. Prereq: Elementary Linear Algebra and Calculus of Several Variables.

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

5140 Theory of Least Squares (3)

5210 Stochastic Processes I (3)

5211 Elementary Statistics (3)
Introductory statistics for graduate students. Probability, sampling distributions, estimation, and hypothesis testing. Emphasis on interpretation and decision making. Not counted toward a major or minor in statistics.

5311 Fundamental Concepts of Probability Theory (3)
Probability axioms, discrete and continuous random variables, joint distributions, functions of random variables, expectation, and sampling distributions. Prereq: Analytic Geometry and Calculus of a Single Variable or Calculus Refresher and 1 course in computer programming.

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

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

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

6060 Applied Multivariate Analysis (3)
 Canonical correlation; discriminant analysis for several groups, and for equal and unequal covariance matrices; principal component analysis; Hotelling's $T^2$; multi-variate analysis of variance and covariance. Prereq: One year's course work in applied statistics, including analysis of variance and multiple regression analysis.

6070 Factor Analysis (3)
Principal component analysis and principal factor analysis; estimates of communalities; methods of rotation; interpretation of factors: cluster analysis. Prereq: 6060.

6110 Multivariate Analysis (3)

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

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

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

**MASTER OF SCIENCE**

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

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

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

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

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

- 24 hours of approved courses in the major, including Communications 5100, 5120, and 5140, at least nine hours in one concentration area (Advertising, Broadcasting, Journalism), and at least 15 hours at the 5000 level;
- 9 hours of thesis work;
- at least 12 hours in a minor** area approved by the major advisor, at least six of which must be at the 5000 level.

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

After the student completes the formal program of courses and research, the student must pass an oral examination conducted by his/her graduate committee. The non-thesis* option requires completion of 45 hours of approved graduate work:

- 33 hours of approved courses in communications, including Communications 5100, 5120, and 5140, at least 12 hours in one concentration area (Advertising, Broadcasting, Journalism), and at least 15 hours at the 5000 level;
- at least 12 hours in a minor** area approved by the major advisor, at least six of which must be at the 5000 level;
- completion of an approved communications project (no more than one independent study-type course directly related to the project may be taken as part of the 45-hour program);
- after completion of formal course program and project, the student must pass a 3-4 hour comprehensive written examination conducted by his/her graduate committee.

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

**DOCTOR OF PHILOSOPHY**

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

The program is interdisciplinary, consisting of a required core curriculum and recommended emphasis outside the College of Communications.

* The student must declare which option he/she will pursue upon completion of the core curriculum (5100, 5140, 5120).

** Minor: Students who hold a bachelor's degree in Advertising, Broadcasting, or Journalism must minor outside the College of Communications.
lege in the related social and behavioral sciences. The program is flexible and will accommodate a wide variety of career goals in Communications.

The Master's degree is not required for entry into or completion of the doctoral program. Program planning, however, will permit the Master's degree to be earned if desired. Students lacking academic or professional experience in Communications will be required to take prerequisite courses. In general, however, the program may be completed within three academic years of full-time study beyond the Bachelor's degree.

The following minimal requirements are normally required for admission to full potential candidate status: (a) a 3.0 (4.0 system) grade point average in undergraduate studies, or 3.5 for graduate work if applicant holds a Master's degree; (b) above the 50th percentile in verbal and quantitative aptitude on the Graduate Record Examination; (c) completion of the California Psychological Inventory; (d) endorsement by at least three former teachers or professional colleagues chosen by the Graduate Studies Committee; (e) a statement of the applicant's goals and reasons for pursuing the doctorate. Personal interviews with members of the Graduate Studies Committee may be required. Professional experience in some field of communications is a highly desirable criterion for admission.

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

The following courses represent the required core curriculum (beyond the Bachelor's degree):

- Communications 5100, Introduction to Graduate Studies
- Communications 5140, Communications Theory
- Communications 5120, Research Methods
- Communications 6100, Seminar in Communications Theory
- Communications 6200, Seminar in Communications Topics
- One of the following: Communications 6300, Survey Research Methods in Communications; 6310, Experimental Research Methods in Communications; 6320, Seminar in Historical Research Methods in Communications. For the teaching or administrative technical competence area: a one-week, non-credit computer program course and Statistics 5211, or Sociology 5320 and Statistics 4250; for the research technical competence area: Statistics 5050 and 5060. Continuing and Higher Education 5450, Instruction in Higher Education.

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

**Departments of Instruction**

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

**Communications**

**MAJOR DEGREES**

**Communications**

M.S., Ph.D.

**Professors:**

J. B. Hashkins, Ph.D. Minnesota; D. G. Hileman, Ph.D. Illinois; D. W. Holt, Ph.D. Northwestern; J. R. Lynn, Ph.D. Southern Illinois.

**Associate Professors:**

E. W. Dunn, Ph.D. Texas; E. F. Shaw, Ph.D. Stanford.

**5000 Thesis**

5100 Introduction to Graduate Studies (3)

Scope and methods of advanced study in communications. Information sources, literature review methods, scholarly style, thesis and degree requirements and procedures, overview of traditional and behavioral research methods.

5120 Research Methods (3) Communications research strategy and methodology, the principles of bivariate, single-factor and multi-factor experimental design, and consumer research; development and analysis of hypotheses, and basic methods of designing research in communications.

5130 Advanced Principles of Mass Communications (3) A pro-seminar covering all phases of mass communications including the history, development and current status of the communication industry, the principles of broadcasting, and the principles of advertising.

5140 Communications Theory (3) Analysis of contemporary theories of human communication emphasizing similarities and differences of communication processes in interpersonal, intrapersonal, and mass communication's systems. (Same as Speech and Theatre 5140.)

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

6000 Doctoral Research and Dissertation

6100 Seminar in Communications Theory (3) An intensive analysis of selected theories and supporting research data dealing with source, message, media, receiver, or situational variables in the process of communication. Prereq: 5140. Recommended: 5100.

6200 Seminar in Communication Topics (3) Intensive analysis of special issues and problems in human communication. Repeatable; each term will cover a specific professional area, e.g., international communication, public service communication, political communication. Prereq: 5100. Recommended: 5140.

6300 Survey Research Methods in Communications (3) Survey methods applied to opinion and communications media research problems. Planning, sampling, questionnaire construction, data gathering (personnel, mail, and telephone), data processing and interpretation, attitude measurement and message pre-testing applications. Prereq: 5200 or consent of instructor.

6310 Experimental Research Methods in Communications (3) Experimental methods applied to communications research problems. Causal inferences from various research designs. Control, single-factor and multi-factor experimental designs. Laboratory and field experiment situations. Prereq: 5120 or instructor's permission. Basic statistics course either before or concurrent.


**Advertising**

**Professors:**

R. Joel (Head), M.A. Wisconsin; D. G. Hileman, Ph.D. Illinois; J. R. Lynn, Ph.D. Southern Illinois.

**Associate Professors:**


**3630 Advertising Copy and Layout (4) Importance of advertising ideas and their translation into persuasive words and pictures. Principles and techniques of writing copy and preparing layouts. Lectures and labs. Prereq: Advertising Principles, Marketing Communications II, or consent of instructor.**

4000 Advanced Advertising Copy and Layout (4) Creative strategy and execution of advertisements for mass media. Problems in idea creation for advertisers. Lectures and labs. Prereq: 3630 or consent of instructor.

4360 Advertising Media (3) Study of media, markets, and audiences. Evaluation of media in relationship to communications needs of advertisers. Prereq: Advertising Principles, Marketing Communications II or consent.

4460 Advertising Cases and Problems (3) The case approach to the study of advertising problems. Analysis of campaigns and trends. Prereq: 4000 and 4360 or consent of instructor.

4470 Advertising Campaigns (3) Practical application of advertising theory in planning and execution of advertising campaigns. Media and consumer research; development and allocation of budgets. Choice of appeals and approaches; media selection; preparation of ad-

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

5510-20-30 Creative Projects (3, 3, 3) Creative or research-oriented interests related to broadcasting. Designed for the advanced student who wishes to apply theory and skills to specific problems in advertising. Prereq: 4000 and 4460 or consent of instructor.

5970 Independent Study (3)

Broadcasting

Professor: D. W. Holt (Head), Ph.D. Northwestern.


Assistant Professor: F. A. Lester, M.A. Tennessee.

3360 Television and Radio Advertising (3) Principles and practices underlying successful radio-television advertising; emphasis on media research, layout, programming, creativity; instruction in television commercials.

3650 Radio-Television Writing (3) Theory and technique of writing all types of broadcasting scripts and pre-production interests related to radio-television. Emphasis on commercials.

4010 Speech for Broadcasting (3) Fundamentals of today's broadcast conditions as they affect the announcer; pronunciation and oral interpretation of General American, British, German, and French pronunciation. Prereq: Strongly recommended but not mandatory, Public Speaking.

4040 Advanced Television Production (3) A semi-independent course of study in program orientation, producing, directing, and performing with a stronger orientation toward the professional broadcast student. Prereq: Television Production or consent of instructor.

4610 Broadcast News Operation (3) Theory and practice in covering local news and public affairs events for radio and television. Gathering and production of news broadcasts, using tools of broadcast newsmanship. 2 hrs and 1 lab. Prereq: Radio-Television News and Television Film News or consent of instructor.

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

4680 Broadcast Sales Management (3) Problems of pricing, promotion, and sales, including case studies in sales development, pricing, promotion, and other problem areas. 2 hrs and 1 lab. Prereq: Introduction to Broadcast- ing or consent of instructor.

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

5510-20-30 Creative Projects (3, 3, 3) For students having specialized broadcasting interests or those who wish extensive directed study in creative writing or production projects.

5610 Public Affairs Broadcasting (3) Study of the news and public affairs function in broadcasting stations and networks, including management, economics, personnel utilization, sources of program materials, ethical and legal aspects. Prerequisites: Radio programming, particularly the press conference, interviews, and news specials. Prereq: Radio-Television News or consent of instructor.

5620 Broadcast Law and Regulations (3) Sociopolitical control of broadcasting; effect of laws, regulations, and public pressures upon station policies. Particular emphasis upon the unique aspects of broadcast programming among the media in terms of regulation. Prereq: Journalism 4410 or 5210 or consent of instructor.

5630 Broadcast Documentary Writing (3) Study of the role of the documentary in radio and television. Research, writing, and critique of documentary programs.

5650 Radio-Television Program Development (3) Planning basic program structures for broadcasting; emphasis on programming and current programming practices as related to audience requirements, governmental influence, and conditions. Individual studies of program development on both the local station and network levels. Prereq: Introduction to Broadcasting or consent of instructor.

5970 Independent Study (3)

School of Journalism

Professors: D. C. Cade (Director), Ph.D. Iowa; J. B. Haskins, Ph.D. Minnesota; J. E. Kallhooven, M.A. Louisiana State; J. M. Lain, M.A. Iowa; B. K. Leiber, Ph.D. Southern Illinois; W. C. Tucker, (Director-Emeritus) M.A. West Virginia.

Associate Professors: J. A. Crook, Ph.D. Iowa State; S. S. Puett, M.S. Tennessee; E. F. Shaw, Ph.D. Stanford; F. B. Thornburg, M.A. Florida.

Assistant Professor: J. M. Anderson, M.S. Tennessee.

3120 Writing Feature Articles (3) Writing feature articles for trade journals and magazines. Market analysis and free-lance selling. Prereq: Writing for Mass Media or consent of instructor.

3410 Communications Law (3) Statutory law and judicial precedents affecting mass communications media. Libel, contempt of court, invasion of privacy, copyright, broadcasting, advertising, and postal regulations.

3560 Investigative and Specialized Reporting (3) Investigative and interpretative reporting of complex or specialized subjects to place news in perspective or to clarify situations. Emphasis on writing for publication. Prereq: Reporting or consent of instructor.

4100 Journalism in the High School (3) Functions and methods of high school publications. Staff organization, writing and editing techniques, editorial problems, and business management.

4110 News and Feature Photography (3) Advanced principles and methods in black-and-white photography. Emphasis on news and feature photographs and picture stories. Prereq: Press photography or consent of instructor.

4590 Problems in Research (3) Analysis of editorial problems, practical instruction and practice in writing editorials, columns, paragraphs, and interpretative articles.

4910 Reporting Public Affairs (3) Instruction and practice in reporting news of courts, politics, government, finance, labor, and social agencies. Prereq: Editing for Mass Media.

4410 Mass Media and Society (3) Role of communications media in society. Codes and ethics of broadcasting, publishing, and current developments in newspaper management.

6110 Journalism in the High School (3) Functions and methods of high school publications. Staff organization, writing and editing techniques, editorial problems, and business management.

5120 Government and the Press (3) Instruction and practical experience in reporting on news of public affairs, including governmental, political and regulatory events, organization, and operations. Student publication. Prereq: Communications History or consent of instructor.

5250 Public Opinion and Mass Media (3) Students will consider the nature of public opinion with emphasis on the role of the press in its formation and on the influence of public opinion. Prereq: 4410 or consent of instructor.

5510-20-30 Writing and Editing Projects (3, 3, 3) A course serving students with specialized writing or editing interests, such as agricultural, technical, or problem-solving interests related to advertising, media audiences, and evaluation of advertising messages. Prereq: Consent of instructor.

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

5710 Studies in Public Relations Communications (3) A continuation of the problems of communication between institutions and organizations and their publics. Case histories and evaluation of public relations programs. Prereq: 3710 or consent of instructor.

5810 Magazine Editing and Production (3) Analysis of editorial and production problems of general, regional, or specialized publications. Reader interest evaluation. Individual editorial projects. Prereq: Consent of instructor.

5950 Communications and International Development (3) A seminar examining the role of mass communications in international and international development. Communication and change in the developing countries. Problems in international communications and cultural change. Prereq: 4950 or consent of instructor.

5970 Independent Study (3)
College of Education

James D. McComas, Dean
William H. Coffield, Associate Dean for Graduate Studies and Administration
E. Dale Doak, Associate Dean for Undergraduate Programs
Madge M. Phillips, Director, School of Health, Physical Education, and Recreation
Charles M. Peccolo, Director, Bureau of Educational Research and Service

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

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

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

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

SPECIALIST IN EDUCATION DEGREE
This degree may be earned in Educational Administration and Supervision, in Educational Psychology and Guidance, in Curriculum and Instruction, in Safety Education and Service, or in Vocational-Technical Education.

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

Bureau of Educational Research and Service

Four major types of activities—research, development, educational services, and publications—are channeled through the Bureau of Educational Research and Service (BERS), located in Claxton Education Building. The research activities relate to the development of research proposals, conducting research, and assisting others in development of research proposals in the College of Education. Developmental activities relate to change efforts in curricular content and instrumental methodology. Educational services include a wide list of activities such as in-service educational programs, consultant services, educational services, and administrative training programs. Official publications of the College of Education are developed through the Bureau. A limited number of graduate student assistantships are available. The Educational Opportunities Planning Center, the Research Coordinating Unit, and the School Planning Laboratory are integral parts of the Bureau of Educational Research and Service.

EDUCATIONAL OPPORTUNITIES PLANNING CENTER

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

RESEARCH COORDINATING UNIT

The Research Coordinating Unit (RCU), located in Alumni Hall, is available for use by students, faculty, administrators, and vocational educators in the state. The primary objectives of the RCU are to collect and disseminate information, stimulate research, and conduct research in selected areas. The RCU has a library with the complete series of ERIC documents stored on microfiche. Microfiche reader-printers are available in the library. Computer searches of the ERIC files are also available at a nominal cost.

SCHOOL PLANNING LABORATORY

The School Planning Laboratory (SPL), located in Claxton Education Building,
assists schools and colleges in integrating curriculum offerings with architectural designs, organizing regional institutes to promote innovative construction concepts, encouraging full staff utilization to secure an optimal learning environment, facilitating renovations to existing buildings, and conducting custodial clinics on proper maintenance techniques. Coursework relating specifically to school planning is offered through the Department of Educational Administration and Supervision, while two-year graduate assistantships are under the administrative auspices of the Laboratory.

Departments of Instruction

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

Art and Music Education

Charles H. Ball, Head

Art Education

MAJOR

DEGREE

Art Education

M.S.

Professor:

J. W. Robertson, Ed.D. Columbia.

Assistant Professors:


3210 Art in the Secondary School Program (3) Program planning; materials and equipment; relation to other school experiences. Classroom observation. Prereq: 9 hrs art education. 1 hr and 2 labs.

3920 Clay in School Program (3) Exploring methods of hand-built forms, glazing and firing procedures. Prereq: Introduction to Art Education in the Schools. 1 hr and 2 labs.

3930 Textiles in School Program (3) Exploration of processes of weaving, stitching, batik, and silk screen. Prereq: Introduction to Art Education in the Schools. 1 hr and 2 labs.

4120 Designing of Teaching Aids for Art in School Program (3) Design and preparation of charts, exhibitions, slides, films, and other teaching aids for art grades one through twelve. Prereq: Introduction to Art Education in the Schools or consent of instructor. 1 hr and 2 labs.

4350-60-70 Problems in Art Teaching (3, 3, 3) Prereq: Consent of instructor.

5000 Thesis

5210 Organization, Administration, and Supervision of Art in the School Program (3)

5310 Art in Education (3) Historical background; current philosophy, theory, and trends; nature and function of aesthetic behavior in the visual arts; relationships to psychology, sociology, and anthropology.

5320 Program Development in Art Education (3) Objectives, organization, content selection, facilities, and equipment; supervision; evaluation; professional growth; leadership and community relationships; art for the special student.

5850-60-70 Problems in Art Education (3, 3, 3) Prereq: Consent of instructor.

Music Education

MAJOR

DEGREE

Music Education

M.S.

Professors:


Associate Professor:


Assistant Professors:


Thesis and non-thesis programs lead to the Master of Science degree in music education. Prerequisite preparation: undergraduate degree or equivalent in music education.

All graduate students in music education must pass proficiency examinations in music theory and applied music.

Requirements for Thesis Program:

45 quarter hours including thesis (9 hrs), the music education major (18 hrs), minor areas in music (9 hrs), and professional education (9 hrs). Required courses:

Music Education 5000, 5210, 5220, 5230; 5310, The Role of Music in Education 5710.

Requirements for Non-Thesis Option:

1. Minimum of 51 quarter hours of course work with a minimum of 26 hours of the 5000 level.

2. Evidence of ability to understand and interpret research through completion of:

A. Educational Statistics 5610 or the equivalent.

B. Music Education 5710.

C. Satisfactory performance of research activities in required courses in music education listed below.

3. Curriculum design: With the exception of the required courses listed below, with approval of the student's advisor, courses may be selected as described more fully below. This provides the flexibility necessary for the student to pursue in some depth specialized interests and needs in the following areas of music teaching: Elementary; Secondary (Junior and Senior High); Vocal (Choral); Instrumental (Band and Orchestra); and Supervision.

(1) A major: at least 27 quarter hours in music education.

(2) A minor: at least 15 quarter hours in music.

(3) 9 quarter hours in professional education, including Educational Statistics 5610 and Educational Psychology 4760 or equivalents and a three-hour elective.

4. Specific course requirements:

A. Music Education Foundation (15 quarter hours)

(1) One seminar (3 hours)

(2) 5210, Psychological Foundations of Music

(3) 5240, Evaluation Procedure in Music Education

(4) 5250, The Role of Music in Education

(5) 5710, Research in Music Education

B. Music

Six quarter hours in applied music (piano; voice; a band or orchestra instrument; or theory and composition).

C. Education (Limited elective of 6 quarter hours)

Education 4760, Advanced Child Study; or 5950, Learning and Development in Children; 5200, Advanced Educational Psychology; or other appropriate course in Educational Psychology with three hours credit.

5. Electives (with approval of advisor):

A. Music Education: 12 credit hours from courses numbered 5000.

B. Music: 9 credit hours from courses at the 3000-, 4000-, or 5000-levels. No courses required in the undergraduate curricula may be included.

C. Education: 3 credit hours, elected from other departments in Education.

6. Evaluation (in addition to routine examinations in courses):

A. Written comprehensive examination in major and minor fields.

B. The student shall elect one of the evaluation procedures below (with approval of advisor and committee):

(1) Oral examinations in major and minor fields.

(2) A public recital in principal instrument, piano or voice.

(3) The presentation in public performance of an original musical composition(s) accepted by the committee as music suitable for school music performing groups.

(4) Plan, rehearse and conduct a full public performance of music by junior or senior high school music groups. This shall be worked out as a long-term project under the supervision of the student's committee.

7. Student's Committee: A minimum of three faculty members: the advisor from music education; one member from music; one member from education.

4410 The Administration and Organization of Recreational Music Programs (3) Purpose of music in recreation; scope of activities, organizational procedures, resources, and coordination required in community music programs.

4441-42-43 Teaching Class Piano (1, 1, 1) For majors in music, music education, or elementary education. Prereq: Consent of Instructor.

4450 Music in Special Education (3) The role and application of classroom music activities
in the educational and rehabilitational programs of atypical children. Study of the uses and valuation of music as a therapy for emotionally disturbed, brain-injured, speech defective, physically disabled, and mentally retarded children. For majors in Special Education. Prereq: Teaching Music in the Primary, Intermediate, and Upper Grades.

4460 Marching Band Techniques (3) Functions, organization, and direction of the school marching band.

5000 Thesis

5150 Studies in Secondary School Music (3) Development of understandings regarding growth patterns and processes through music experiences; cultural and community influences on secondary school music, problems in the administration and teaching of music in the secondary school; and relationship of music with the humanities in the curriculum. Sequel to Teaching Music in Junior and Senior High Schools.

5210 Psychological Foundations of Music (3) Perception; function; aesthetics; talent; measurement; implications for teaching theory and practice. An overview of classic and current experimental studies. Prereq: Consent of instructor.

5220 The Administration and Supervision of School Music (3) Relates primarily to improvement of the role of the teacher-learning process in music education. Problems of supervision, research, and in-service education, teacher preparation, and guidance given careful consideration and study.

5230 Comparative Teaching Procedures in Music Education (3) Modern teaching theories and their implications.

5240 Evaluation Procedures in Music Education (3) Tests, measurements, and evaluation of musical development of students at all levels. Standard educational measurements and teacher-made tests applicable to music and specialized evaluative techniques for use in classroom situations. The uses of musical aptitude and achievement tests. Statistical measures applied to learning music. Prereq: General Psychology, Educational Psychology and Elementary Statistics.

5250 The Role of Music in Education (3) An exploratory course designed for school personnel, teachers, and others on the role of music in public education. No previous experience in music required.

5260 Music for Early Childhood (3) Prereq: Teaching Music in the Intermediate and Upper Grades or consent of instructor.

5270 Studies of Music for Children in the Primary Grades (3) Children’s growth processes in music for Grades I-III, and musical experiences. For the major in Music Education and/ or Elementary Education. Prereq: Teaching Music in the Intermediate and Upper Grades or Elementary School or consent of instructor.

5320 Advanced Choral Literature and Conducting (3) Reading, conducting, and interpreting vocal scores suitable for school, college, church, and community groups; emphasis on orchestration and standard major choral works. Prereq: Undergraduate degree with a major in Music or Music Education; Choral and Instrumental Conducting and Teaching Instrumental Music or equivalent.

5510-20-30 The Talent Education Program of Shinichi Suzuki (2, 2, 2) Study of the psychology, procedures and literature utilized by Shinichi Suzuki in the Talent Education program in Japan. Prereq: Consent of instructor.

5710 Research in Music Education (3) Prereq: Consent of instructor.

5810 Seminar (3) Music teaching in the primary and intermediate grades. Survey of research, professional literature and development of bibliography, laboratory activities. Projects. Prereq: Admission to M.S. program.

5820 Seminar (3) Music teaching in the vocal and general music areas of the junior high school curriculum. Survey of research, professional literature and development of bibliography. Laboratory activities. Projects. Prereq: Admission to M.S. program.

5830 Seminar (3) Music teaching in the instrumental areas of the elementary, junior high, and senior high curricula. Survey of research, professional literature and development of bibliography, laboratory activities. Projects. Prereq: Admission to M.S. program.

5840 Seminar (3) Music teaching in the vocal, theoretical, historical, and appreciation areas of the secondary school curricula. Survey of research, professional literature and development of bibliography, laboratory activities. Projects. Prereq: Admission to M.S. program.

Continuing and Higher Education

MAJOR DEGREE

5510 Governance of Colleges and Universities (3) Study of the development, change, trends, process, and structure of collegiate governance.

5550 Fiscal Problems in Higher Education (3) A study of revenue sources and fiscal management in public and private colleges and universities.

5660 Program Planning in Continuing and Higher Education (3) Theory and method for planning adult education programs.

5860 The Community-Junior College (3) History and role of the two-year college; major functions, organization and administration, problems, and issues.

5955-57 Practicum in Continuing and Higher Education (3, 3, 3) Supervised practice in selected areas of instruction or administration of continuing or higher education programs.

5960-70 Seminar in Continuing and Higher Education (3, 3) Problems and issues confronting professionals in the fields of adult or higher education.

6450 Community Education for Adults (3) Contemporary programs; extension of secondary school opportunities for adults.

See also course listings under the Departments of Curriculum and Instruction, Educational Administration and Supervision, and Educational Psychology and Guidance.

Curriculum and Instruction

MAJORS DEGREES

Curriculum Bachelor's M.S.

Curriculum and Instruction Bachelor's M.S., Ed.D.

Elementary Education Bachelor's M.S.

English Education Bachelor's M.S.

Foreign Language Education Bachelor's M.S.

Instructional Materials Bachelor's M.S.

Mathematics Education Bachelor's M.S.

Science Education Bachelor's M.S.

Social Science Education Bachelor's M.S.


Surveys the historical development of the field, philosophies of adult education, agencies, programs, current issues, and the literature of adult education.

5110 Seminar in College Teaching (3) Effective college teaching; testing and measurement; recent research in college instruction; major problems and issues in higher education. Required of candidates for the MACT degree. S/NC only.

5330 Theory and Research in Human Learning (3) (Same as Ed. Psy. 5330.)

5360-70 Problems in Continuing and Higher Education (3, 3) Independent study of problems and special institutes.

5440 American Higher Education (3) Purposes, functions, organization, and programs.

5450 Instruction in Higher Education (3) Problems, procedures, and techniques.

5460 Adult Development (3) Changes in characteristics of the adult over the life span and implications for adult education.

5510 Special Problems in Music Education (3) Surveys the historical development of the field, philosophies of adult education, agencies, programs, current issues, and the literature of adult education.

5520-60-70 Problems in Continuing and Higher Education (3, 3) Independent study of problems and special institutes.

5530-40-50 Problems and Issues in Adult Education (3, 3) Independent study of problems and special institutes.

5550 Fiscal Problems in Higher Education (3) A study of revenue sources and fiscal management in public and private colleges and universities.

5660 Program Planning in Continuing and Higher Education (3) Theory and method for planning adult education programs.

5860 The Community-Junior College (3) History and role of the two-year college; major functions, organization and administration, problems, and issues.

5955-57 Practicum in Continuing and Higher Education (3, 3, 3) Supervised practice in selected areas of instruction or administration of continuing or higher education programs.

5960-70 Seminar in Continuing and Higher Education (3, 3) Problems and issues confronting professionals in the fields of adult or higher education.

6450 Community Education for Adults (3) Contemporary programs; extension of secondary school opportunities for adults.

See also course listings under the Departments of Curriculum and Instruction, Educational Administration and Supervision, and Educational Psychology and Guidance.


Graduate programs are designed to improve scholarship and educational competence in a number of areas leading to the Master of Science degree, the Specialist in Education for Curriculum and Instruction, or the Doctor of Education degree.

MAster's Program

For the Master of Science degree, thesis and none-thesis options are available in the following majors: curriculum, elementary education, English education, foreign language education, instructional materials, mathematics education, science education, or social science education. The non-thesis option requires the completion of 51 quarter hours of coursework.

Specialist Program

The Educational Specialist degree program in the Department of Curriculum and Instruction will encompass concentrations in the following areas:

Curriculum

Elementary Education

English Education

Foreign Language Education

Instructional Materials (Media)

Mathematics Education

Science Education

Social Science Education

The program includes a minimum of 90 quarter hours of graduate study. If the student has earned the Master's degree, a maximum of 36 quarter hours of his Master's work may be credited to the 90 hour Ed.S. requirement. (45 hours of 5000-level courses are required.) The program also includes both of the following:

1. A minimum of 12 hours taken in one of the eight areas listed above.
2. A minimum of 12 hours taken within the College of Education in areas other than the student's major area.

3. A minimum of 12 hours taken outside the College of Education.

4. A minimum of nine hours earned through the writing of a thesis. (Students who have written a thesis for the Master's degree may be exempted from a thesis in the Ed.S. program provided, in the judgment of the student's committee, the thesis meets the standards of research appropriate for the Ed.S. degree.)

5. A minimum of 45 elective hours may be earned through the writing of a thesis.

Doctoral Program

The doctoral major in Curriculum and Instruction may include emphasis upon the following fields: comparative education, curriculum, educational philosophy, educational psychology, educational administration, English education, foreign language education, mathematics education, science education, social science education.

For further information, write the Department of Curriculum and Instruction.

4000 Mathematics Laboratories in the Elementary School (3) Introductionary course for elementary school teachers or prospective teachers dealing with activity-oriented mathematics laboratory materials and pedagogical strategies for instruction, enthusiasm, interest, and achievement in mathematics. The essence of the laboratory concept of learning mathematics is the fostering of inquiry, problem solving, and self-motivation to seek answer to posed questions.

4010 International Education: Europe and the Americas (3) Historical, philosophical, and sociological foundations; special reference to England, USSR, France, and Germany.

4110 Philosophies of Education in Cultural Perspective (3) Education in relation to the liberal, conservative, reactionary, and radical currents of thought in American culture.

4150 School Library Administration (3) Same as L.I.S. 4150.

4200 Creative Thinking and Expression in the Elementary School (3) Designed to give students the opportunity to examine the development of creative potential across the academic curriculum of the elementary school. The student will hopefully develop techniques and strategies as well as an understanding of creativity in relation to child development and self actualization.

4210 Curriculum in Elementary School Social Studies (3) Survey of current curricular approaches and trends in elementary school social studies. Prereq: Teaching experience or student teaching.

4215 Teaching Elementary School Science (3) Methods and materials used in teaching science in elementary school. Developmental and diagnostic/creative programs. Not open to students with recent course or background in teaching elementary science.

4216 Teaching Elementary School Mathematics (3) Methods and materials used in teaching mathematics in elementary school. Developmental and diagnostic/creative programs. Not open to students with recent course or background in teaching elementary mathematics.

4217 Teaching Elementary School Language Arts (3) Methods and materials used in teaching elementary school language arts. Development of functional relationships with other curriculum areas, diagnostic procedures, and corrective work. Not open to students with recent course or background in teaching elementary school language arts.

4250 Initiating the Activities Program (3) Prereq: Child Study, 6 hrs of Methods of Teaching in the Elementary School.

4260 Philosophy of Education: Introductory Studies (3) Truth, knowledge, and valuation in relation to the work of the schools. Prereq: History and Philosophy of Education, Child Study or Educational Psychology; Adolescence, or equivalent.

4261 Educational Classics (3) Discussion of selected writings from Plato to Dewey.

4280 Diagnosis and Correction of Classroom Reading Problems (3) Prereq: Teaching Reading in the Elementary School or equivalent.

4300 Developmental Reading in the Secondary School (3)

4301 Teaching Developmental Reading (3) Methods and materials used in teaching reading in the elementary school. Includes development of functional relationships with other curriculum areas, diagnostic procedures and remedial work. Not open to students with recent course work or background in the teaching of reading.

4302 Teaching Reading to Linguistically Different Learners (3) Language characteristics and special reading problems attendant with the linguistically different learner. Prereq: An undergraduate reading course or 4300.

4340 The Junior High School and Middle School (3) To identify and analyze the distinguishing characteristics of the Junior High and Middle School Curriculums.

4350-60-70 Problems in Teaching English (3, 3, 3)

4351-61-71 Problems in Teaching Mathematics (3, 3, 3)

4352-62-72 Problems in Teaching Social Studies (3, 3, 3)

4353-63-73 Problems in Teaching Science (3, 3, 3)

4354-64-74 Problems in Teaching Language Arts (3, 3, 3)

4355-65-75 Problems in Teaching General Curriculum (3, 3, 3)

4356-66-76 Problems in Teaching Instructional Materials (3, 3, 3)

4357-67-77 Problems in Teaching Foreign Languages (3, 3, 3)

4359-69-79 Problems in Teaching Conservation (3, 3, 3)

4380-90-400 Problems in the Improvement of Instruction (2, 2, 2) Social conferences, workshops, or in-service programs.

4381 Problems in Early Childhood Education (3) May be repeated. Maximum 9 hrs. 6 hrs can be taken concurrently.

4410 Educational Sociology (3) Emphasis on examination of the school as a social system. (Same as Sociology 4410)

4450 Teaching in Kindergarten: Overview (3) Relationship of kindergarten to total elementary program; goals; historical settings and current developments.

4451 Teaching in Kindergarten: Program Development (3) Curriculum planning and or...
5211 Instructional Strategies in Elementary School Social Studies (3) Specific teaching methods and instructional procedures for organizing social studies learnings will be compared. Prereq: An undergraduate social studies course or equivalent.

5220 Seminar in Comparative Education: The Americas (3) Historical, philosophical, and sociological foundations: special reference to Canada, Brazil, Mexico, and Cuba.

5250 Secondary School Instruction (3)

5270 The Elementary School Curriculum (3) Theoretical background and experimental approaches.

5280 The Teaching of Language Arts in the Elementary School (3) Trends, issues, and research in content and method for the language arts program, grades 1-8. Prereq: Undergraduate course Teaching Language Arts in the Elementary School or consent of instructor.

5281 Teaching Social Studies in the Elementary School (3) Recent trends, issues, and research findings. Credit cannot be received for both 5281 and 5971.

5282 Teaching Science in the Elementary School (3) Trends, issues, and research in content and method for the elementary program.

5283 Programs and Materials in Teaching Elementary Science (3) An in-depth analysis of new and innovative science program materials, as well as instructional strategies inherent in the teaching of these materials. Prereq: 5282 or equivalent, or consent of instructor.

5284 Seminar in Teaching Elementary Science (3) Analysis of current curricular issues related to elementary science education. Emphasis on individual student presentations, projects, and investigations. Prereq: Teaching Science in the Elementary School or 5282 or equivalent, or consent of instructor. At least one year teaching experience (K-3).

5290 The Teaching of Mathematics in the Elementary School (3) Trends, issues, and research in content and method for the mathematics program, grades 1-8. Prereq: Teaching Arithmetic in the Elementary School and 9 hrs Structure of the Number System or consent of instructor.

5291 Programs and Materials in Elementary School Language Arts (3) Examination of programs and special instructional aids associated with the language arts. Prereq: 5282 or equivalent, or consent of instructor.

5292 Seminar in Research and Theory in Teaching Mathematics in the Elementary School (3) A systematic study of research and theory and their application to teaching of mathematics. Prereq: Teaching Arithmetic in the Elementary School or equivalent, consent of instructor, and one year of teaching experience.

5302 Psychology of Reading (3) Presents a deeper understanding of the reading act, a more accurate insight into the relationship between learning theory and reading, and a greater knowledge of the role of reading in the child's overall development. Prereq: An undergraduate reading course or consent of instructor.

5304 Programs and Materials for Reading Instruction (3) Developing a rationale for the examination, selection, and use of materials in the reading program. Special emphasis on distinguishing between approaches and materials for teaching reading. Prereq: Teaching of Reading in the Elementary School or 4300 or consent of instructor.

5305 Trends and Issues in Teaching Reading (3) A critical analysis of new programs, materials, innovations, and developments in reading. Prereq: An undergraduate course in reading or consent of instructor.

5350 Curriculum Development and Evaluation (3)

5360-70 Curriculum Development in the Local School (3, 3)

5380 Diagnosis of Remedial Reading Problems (3) Prereq: 4260.

5381 Remediation of Remedial Reading Problems (3) Prereq: 5350 or consent of instructor.

5382 Developmental Reading Practicum (3) Diagnosing and teaching children having developmental and corrective reading needs. Prereq: 4260.

5383 Remedial Reading Practicum (3) Prereq: 5381.

5390 Organization and Administration of Reading Programs (3)

5410 The High School Curriculum (3) Theoretical background and experimental approaches.

5530 Curriculum Laboratory for High Schools (3) Study and production of syllabi, courses of study, source units, and other materials.

5580 Curriculum Planning and Development (3)

5610 Educational Statistics (3)

5620 Problems in Direction and Supervision of Student Teaching (3)


5640 Newer Trends in Elementary Education (3) Trends in classroom procedures, equipment, and materials of instruction; problems involving improvement of instruction.

5650-60 Curriculum Laboratory for Elementary Schools (3, 3) Study and production of syllabi, courses of study, source units, and other materials.

5670 Curriculum Laboratory for Early Childhood Education (3)

5691 Production and Use of Audiovisual Materials (3) Practical graphics, adapted to the needs of students. Projects: picture mounting, transparencies, slides, and lettering. Prereq: L.I.S. 4750 or equivalent. (Same as L.I.S. 5691.)

5710 Techniques of Research in Education (3) Study and application.

5720 Classroom Observation and Analysis (3) Classroom observation and analysis procedures; development of objective observation and analysis skills, examination of existing observation systems.

5800 Seminar in Cooperative Curriculum Research (3) Action research procedures and their application to programs.

5820 Seminar in the Teaching of Mathematics (3) Analysis of teaching strategies related to subject matter and learner problems. Student presentations initiate discussion sessions. Prereq: At least 1 yr. teaching experience (Math grades 7-12) or consent of instructor.

5825 Teaching Mathematics in the Middle and Junior High School (3) Study and discussion of problems related to teaching mathematics in middle and junior high schools. Emphasis on understanding structure of mathematical concepts as well as strategies, methods, and materials for teaching. Materials suitable for individualized instruction, mathematical laboratories, and independent study are considered. Opportunities for individual