Student Calendar For 1978-79

**Winter Quarter, 1978**

- January 3-4 (Tuesday-Wednesday)
- January 5 (Thursday)
- February 8 (Wednesday)
- March 15 (Wednesday)
- March 17 (Friday)
- March 26
- March 27-28 (Monday-Tuesday)
- March 29 (Wednesday)
- May 2 (Tuesday)
- June 6 (Tuesday)
- June 9 (Friday)
- June 15-16 (Thursday-Friday)
- June 19 (Monday)
- July 4 (Tuesday)
- July 6 (Thursday)
- July 20 (Thursday)
- July 21 (Friday)
- July 24 (Monday)
- August 10 (Thursday)
- August 23 (Wednesday)
- August 25 (Friday)

**Spring Quarter, 1978**

- March 26
- March 27-28 (Monday-Tuesday)
- March 29 (Wednesday)
- May 2 (Tuesday)
- June 6 (Tuesday)
- June 9 (Friday)
- Easter
- Registration
- Classes Begin
- Change of Registration Deadline
- Classes End
- Commencement

**Summer Quarter, 1978**

- June 15-16 (Thursday-Friday)
- June 19 (Monday)
- July 4 (Tuesday)
- July 6 (Thursday)
- July 20 (Thursday)
- July 21 (Friday)
- July 24 (Monday)
- July 24 (Monday)
- August 10 (Thursday)
- August 23 (Wednesday)
- August 25 (Friday)

**Fall Quarter, 1978**

- September 18-20 (Monday-Wednesday)
- September 21 (Thursday)
- October 25 (Wednesday)
- October 27 (Friday)
- November 18 (Saturday)
- November 23-25 (Thursday-Saturday)
- December 5 (Tuesday)
- December 8 (Friday)

**Winter Quarter, 1979**

- January 3-4 (Wednesday-Thursday)
- January 5 (Friday)
- February 8 (Thursday)
- March 15 (Thursday)
- March 19 (Monday)

**Registration**

**Classes Begin**

**Change of Registration Deadline**

**Classes End**

**Commencement**
Correspondence Directory

Graduate Study
L. Evans Roth, Vice Chancellor for Graduate Studies and Research
Margaret N. Perry, Dean for Graduate Studies
Diana C. Lopez, Director of Graduate Admissions
Clea J. Greenawalt, Assistant Director of Graduate Admissions

Graduate Management Admission Test or Graduate Record Examinations
Educational Testing Service, Princeton, New Jersey, or Berkeley, California

Assistantships
Head of department in which you plan to major

Loans
Work Study
Part-time Employment
Student Loans
Carolyn Cuddy, Director, Financial Aid, 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
Dixon Johnson, Alumni Hall

Scholarships and Fellowships
Clea J. Greenawalt, The Graduate School

Thesis Consultant
Georgia Bunn, The Graduate School

Timetable of Classes
Supervisor of Registration, Registrar's Office

Transcripts
Bob L. Cochran, Registrar

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Charges of violation of the above policy should also be directed to the Office of the Vice Chancellor for Planning and Administration.
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 Building
6. Physics Building
7. Hesler Biology Building
8. Austin Peay Building
9. Turner House
10. Alumni Memorial Auditorium-Gymnasium
11. Neyland Stadium, East & South Stadium
12. Berry Hall
13. Estabrook Hall
14. Blount Hall
15. Perkins Hall
16. Ferriss Hall
17. Dougherty Engineering Building
18. White Avenue Building
19. Nursery School
20. Family Life Center
21. Harris Home Economics Building
22. USDA Textile & Clothing Lab
23. Hoskins 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 Health Center
35. UT Credit Union
36. Walters Life Sciences Building
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. Meffre 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 B. 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 Phi
78. Sigma Phi Epsilon
79. Phi Gamma Delta
80. Alpha Gamma Rho
82. Delta Tau Delta
83. Lambda Chi Alpha
84. Physical Plant
85. Transportation Service (Motor Pool)
86. Security Building
87. Purchasing Agent
88. Student Aquatic Center
89. Morrill Hall
90. Humes Hall
91. Presidential Court Building
92. Reece Hall
93. Carrick Hall
94. Apartment Residence Hall
95. Stokely Management Center
96. Biscoe House (Economics Research)
97. Fine Arts Buildings
98. Nuclear Engineering Building
99. Ecology Department
101. Safety Building-2111 Terrace Ave.
103. Southern Regional Media Center for Deaf-1814 Lake Ave
104. Reading Center-1912 Terrace Ave.
105. Tennessee Research Coordination Unit-909 Mountain St.
106. Technical Assistance Center-907 Mountain St.
107. UT Learning Center-2019 Terrace Ave.
Graduate School Office Hours

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

The Graduate School Administration
L. Evans Roth, A.B., M.S., Ph.D., Vice Chancellor for Graduate Studies and Research
Margaret N. Perry, B.S., M.S., Ph.D., Dean for Graduate Studies
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James A. Spencer, B.A., M.C.P., Director, Graduate School of Planning
W. Edgar Barnett, B.S., M.S., 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 Environment Center
Gary R. Purcell, B.A., M.Lib., M.A., Ph.D., Director, Graduate School of Library and Information Science

The Graduate Council
Membership January 1, 1978

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Col. of Communications                                   Dr. George Everett                  Dec. 31, 1979        Dr. Sherilyn Zeigler
Col. of Education                                        Dr. Charles H. Ball                  Dec. 31, 1978        Dr. Peter M. Husen
Col. of Engineering                                      Dr. William H. Coffield              Dec. 31, 1979        Dr. Martha Peters
Col. of Engineering                                      Dr. Jerry J. Bellon                  Dec. 31, 1979        Dr. Woodrow Wyatt
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Col. of Engineering                                      Dr. James F. Darrow                   Dec. 31, 1980        Dr. Betty L. Beach
Col. of Home Economics                                   Dr. Jeffrey Becker                   Dec. 31, 1979        Dr. Donald Clelland
Col. of Home Economics                                   Dr. Otto Stephens                    Dec. 31, 1979        Dr. Carl Cobb
Col. of Home Economics                                   Dr. L. B. Cebik                      Dec. 31, 1980        Dr. David Etnier
Col. of Home Economics                                   Dr. Robert J. Daverman                Dec. 31, 1978        Dr. John Larsen
Col. of Home Economics                                   Dr. B. J. Leggett                    Dec. 31, 1978        Dr. Dan Nimmo
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School of Social Work                                     Dr. Edward J. Pawlak                 Dec. 31, 1980        Dr. Maurice A. Wright
UT Space Institute                                        Dr. James Wu                         Dec. 31, 1979        Dr. Maurice A. Wright

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John J. McDow, B.S., M.S., Ph.D., Dean of Admissions (Undergraduate) and Records
## 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>
<td>G.R.E.</td>
<td>3-Departmental Rating Forms</td>
</tr>
<tr>
<td>Agricultural Economics</td>
<td>M.S., PH.D.</td>
<td>APT.</td>
<td>3-Departmental Rating Forms</td>
</tr>
<tr>
<td>Agricultural Engineering</td>
<td>M.S.</td>
<td>ADV.</td>
<td>3-Former Professors</td>
</tr>
<tr>
<td>Agricultural Extension</td>
<td>M.S.</td>
<td>X</td>
<td>3-Former Professors</td>
</tr>
<tr>
<td>Agricultural Mechanization</td>
<td>M.S.</td>
<td>X</td>
<td>3-Former Professors</td>
</tr>
<tr>
<td>Animal Science</td>
<td>M.S., PH.D.</td>
<td>X</td>
<td>or X</td>
</tr>
<tr>
<td>Food Technology and Science</td>
<td>M.S.</td>
<td>X</td>
<td>or X</td>
</tr>
<tr>
<td>Forestry</td>
<td>M.S.</td>
<td>X</td>
<td>or X</td>
</tr>
<tr>
<td>Ornamental Horticulture and Landscape Design</td>
<td>M.S.</td>
<td>X</td>
<td>or X</td>
</tr>
<tr>
<td>Plant and Soil Science</td>
<td>M.S., PH.D.</td>
<td>X</td>
<td>or X</td>
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<tr>
<td>Wildlife and Fisheries Science</td>
<td>M.S.</td>
<td>X</td>
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<table>
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<tr>
<th>College of Business Administration</th>
<th>DEGREE</th>
<th>ADMISSION TEST REQUIRED</th>
<th>LETTERS OF RECOMMENDATION</th>
</tr>
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<tbody>
<tr>
<td>Business Administration</td>
<td>M.B.A., D.B.A.</td>
<td>X</td>
<td>4-Obtain Forms from Department</td>
</tr>
<tr>
<td>Management Science</td>
<td>PH.D.</td>
<td>X</td>
<td>5-All Ed.S., Ph.D. and Ed.D. applicants obtain special forms from the Graduate School</td>
</tr>
<tr>
<td>Statistics</td>
<td>M.S.</td>
<td>X</td>
<td>6-Rating Forms</td>
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<tr>
<th>College of Communications</th>
<th>DEGREE</th>
<th>ADMISSION TEST REQUIRED</th>
<th>LETTERS OF RECOMMENDATION</th>
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</thead>
<tbody>
<tr>
<td>Communications</td>
<td>M.S., PH.D.</td>
<td>X</td>
<td>3-Former Professors</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>
</tr>
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<tbody>
<tr>
<td>Adult Education</td>
<td>M.S.</td>
<td>X</td>
<td>5-All Ed.S., Ph.D. and Ed.D. applicants obtain special forms from the Graduate School</td>
</tr>
<tr>
<td>Agricultural Education</td>
<td>M.S.</td>
<td>X</td>
<td>6-Rating Forms</td>
</tr>
<tr>
<td>Art Education</td>
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<td>or X</td>
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<tr>
<td>Business Education</td>
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<td>or X</td>
</tr>
<tr>
<td>College Student Personnel</td>
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<td>or X</td>
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<tr>
<td>Curriculum</td>
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<td>5-All Ed.S., Ph.D. and Ed.D. applicants obtain special forms from the Graduate School</td>
</tr>
<tr>
<td>Curriculum and Instruction</td>
<td>ED.S., ED.D.</td>
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<tr>
<td>Distributive Education</td>
<td>M.S.</td>
<td>X</td>
<td>or X</td>
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<tr>
<td>Educational Administration and Supervision</td>
<td>M.S., ED.S.</td>
<td>X</td>
<td>or X</td>
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<tr>
<td>Educational Psychology and Guidance</td>
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<tr>
<td>Elementary Education</td>
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<tr>
<td>English Education</td>
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<td>or X</td>
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<td>Guidance</td>
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<td>or X</td>
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<td>Health Education</td>
<td>M.ACT.</td>
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<tr>
<td>Home Economics Education</td>
<td>M.S.</td>
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<tr>
<td>Industrial Education</td>
<td>M.S.</td>
<td>X</td>
<td>or X</td>
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<tr>
<td>Instructional Materials</td>
<td>M.S.</td>
<td>X</td>
<td>or X</td>
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<tr>
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<tr>
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<td>or X</td>
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<tr>
<td>Public Health</td>
<td>M.P.H.</td>
<td>X</td>
<td>or X</td>
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<tr>
<td>Recreation</td>
<td>M.S.</td>
<td>X</td>
<td>or X</td>
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<tr>
<td>Safety Education and Service</td>
<td>M.S., ED.S.</td>
<td>X</td>
<td>or X</td>
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<td>or X</td>
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<tr>
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<tr>
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<tr>
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<tr>
<td>Vocational Rehabilitation</td>
<td>M.S.</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.E., M.S., PH.D.</td>
<td>X</td>
<td>3-Former Professors</td>
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<tr>
<td>Chemical Engineering</td>
<td>M.S., PH.D.</td>
<td>X</td>
<td>3-Former Professors</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>M.E., M.S., PH.D.</td>
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<td>3-Former Professors</td>
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<tr>
<td>Electrical Engineering</td>
<td>M.E., M.S., PH.D.</td>
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<tr>
<td>Engineering Administration</td>
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<td>3-Former Professors</td>
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<tr>
<td>Engineering Science</td>
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<td>3-Former Professors</td>
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<td>Environmental Engineering</td>
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<td>3-Former Professors</td>
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<td>Industrial Engineering</td>
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<td>3-Former Professors</td>
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<td>3-Former Professors</td>
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<td>Metallurgical Engineering</td>
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<td>3-Former Professors</td>
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<tr>
<td>Nuclear Engineering</td>
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<td>3-Former Professors</td>
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<tr>
<td>Polymer Engineering</td>
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<td>3-Former Professors</td>
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<tr>
<td>College of Home Economics</td>
<td>Degree</td>
<td>Admission Test Required</td>
<td>Letters of Recommendation</td>
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<td>Child and Family Studies</td>
<td>M.S.</td>
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<td>All M.S. and Ph.D. applicants obtain special application form from Associate Dean, College of Home Economics</td>
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<td>Consumer Studies and Housing: Public Policy</td>
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<td>Crafts, Interior Design and Housing</td>
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<td>Food Science</td>
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<td>Food Systems Administration</td>
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<td>Textiles and Clothing</td>
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<tr>
<td>Aviation Systems</td>
<td>M.S.</td>
<td>X</td>
<td>2-Former Professors</td>
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<tr>
<td>Ecology</td>
<td>M.S., PH.D.</td>
<td>X</td>
<td>3-Departmental Rating Forms</td>
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<tr>
<td>Management Science</td>
<td>M.S.</td>
<td>X</td>
<td>3-Former Professors</td>
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<tr>
<td>Organizational Psychology</td>
<td>M.S., PH.D.</td>
<td>X</td>
<td>3-Former Professors</td>
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<tr>
<td>Water Resources Development</td>
<td>M.S.</td>
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| College of Liberal Arts                                |        |                         |                           |
| Anthropology                                           | M.A., PH.D. |   | 3-Former Professors     |
| Art                                                    | M.A., M.F.A. |   | 3-Former Professors     |
| Audiology                                              | M.A.   |                         |                           |
| Biochemistry                                            | M.S., PH.D. |   | 3-Former Professors     |
| Biology                                                | MACT    |                         |                           |
| Botany                                                 | M.S., PH.D. | X | 3-Former Professors     |
| Chemistry                                              | MACT, M.S., PH.D. | X | 3-Former Professors     |
| Computer Science                                       | M.S.   |                         |                           |
| English                                                | MACT, M.A., PH.D. | X | 3-Former Professors     |
| French                                                 | M.A.   |                         |                           |
| Geography                                              | M.S., PH.D. |   | 3-Former Professors     |
| Geology                                                | M.S., PH.D. |   | 3-Former Professors     |
| German                                                 | MACT, MA. | X | 3-Former Professors     |
| German Language and Literature                         | PH.D. |                         |                           |
| History                                                | MACT, M.A., PH.D. | X | 3-Former Professors     |
| Mathematics                                            | M.MATH. |                         |                           |
| Microbiology                                            | M.A., M.S., PH.D. |   | 3-Former Professors     |
| Music                                                  | M.S., PH.D. |   | 3-Former Professors     |
| Philosophy                                             | M.A., PH.D. |   | 3-Former Professors     |
| Physics                                                | MACT, M.S., PH.D. | X | 3-Former Professors     |
| Political Science                                      | M.A., PH.D. |   | 3-Former Professors     |
| Psychology                                             | M.A.   |                         |                           |
| Public Administration                                   | M.P.A. | X                      | 4-Obtain Forms from Department |
| Radiation Biology                                      | M.S., PH.D. | X | 3-Former Professors     |
| Romance Languages                                      | MACT    |                         |                           |
| Sociology                                              | MACT, M.A., PH.D. | X | 3-Former Professors     |
| Spanish                                                | M.A., PH.D. | X | 3-Former Professors     |
| Speech and Hearing Science                             | PH.D. |                         |                           |
| Speech Pathology                                       | M.A.   |                         |                           |
| Speech and Theatre                                     | M.A.   |                         |                           |
| Zoology                                                | M.S., PH.D. | X | 3-Former Professors     |

| College of Nursing                                      |        |                         |                           |
| Nursing                                                | M.S.N. |                         |                           |

| School of Biomedical Sciences                           |        |                         |                           |
| Biomedical Sciences                                     | M.S., PH.D. | X | Obtain Forms from School |

| School of Library and Information Science               |        |                         |                           |
| Library Science                                        | M.S.L.S. | X | 3-Obtain Forms from Department |

| School of Planning                                      |        |                         |                           |
| Planning                                               | M.S.P. |                         |                           |

| School of Social Work                                   |        |                         |                           |
| Social Work                                            | M.S.S.W. |                         |                           |

1 Offered only at UT Space Institute.
2 Offered also at off-campus locations.
3 Departmental doctoral option offered under the major of Home Economics.
4 Interdisciplinary, option offered in each department.
5 Ph.D. applicants only.
6 American applicants only.
7 Ed.D. applicants only.
8 Ed.S. applicants only.
9 International applicants only.
10 Interdisciplinary Ph.D. applicants only.
The Graduate School

The mission of 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.

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 1977 the University provides Master's level work in over 100 fields of knowledge and doctoral work in 47, enrolling more than 6,800 graduate students.

The search for new knowledge and its application to the changing needs of society is a major aim of The University of Tennessee. In graduate instruction, through research programs, and by public service, the University and its faculty constitute a major resource for contributions to state, national, and international problems. In addition to typical departmental units of administration, numerous interdisciplinary programs, institutes, and centers have been developed in the locations and the scholarly areas needed. Beyond those described below, numerous other organizations exist and are described within the appropriate department or college descriptions.

Environment Center

J. H. Gibbons, Director, Ph.D. Duke
R. A. Bohm, Associate Director, Ph.D. Washington (Missouri)

The Environment Center was created to encourage and support UT faculty and students to become involved in interdisciplinary studies to provide alternative solutions to problems related to energy and the environment. The Center provides assistance to faculty interested in developing research and public service projects, manages research and development projects that involve several disciplines, and assists Tennessee government and industry in specific problems related to energy and environment. It also participates in the Statewide Consumer Education Program, especially in developing material.

Projects include the following: environmental and human costs of coal production, solar energy utilization in buildings, energy conservation in buildings and industry, and regional solid waste management and resource recovery.

The Center is operated by UT, Knoxville through the Office of the Vice Chancellor for Graduate Studies and Research.

Transportation Center

K. W. Hathington, Director, Ph.D. Northwestern
R. A. Mundy, Associate Director, Ph.D. Pennsylvania State
D. H. Jones, M.S. Tennessee; R. L. Perry, M.S. Tennessee; P. R. Tutt, M.S. Texas, Assistant Directors

The Transportation Center performs four main functions: (1) managing interdisciplinary transportation projects for the University, (2) managing transportation projects for the Tennessee Department of Transportation, (3) managing highway safety projects for the Governor's Highway Safety Program, and (4) providing public service activities in transportation throughout the state. In performing these functions, the Transportation Center works extensively with various colleges and departments, organizations, and campuses of The University of Tennessee system.

The Center does research in all modes of transportation, including transportation management, railroad and waterways, urban goods movement, airport ground transportation, transportation brokerage, social service transportation, ridesharing, transit, legislation, diagnostic vehicle inspection, highway safety, tunnel construction and ventilation, archaeological exploration, highway construction, and environmental impacts.

The Center is operated by UT, Knoxville through the Office for Graduate Studies and Research. The Center's main office is at UT, Knoxville with a satellite office in Nashville and a special project office in Chattanooga.

The University of Tennessee Space Institute

C. H. Weaver, Dean, Ph.D. Wisconsin
R. L. Young, Associate Dean, Ph.D. Northwestern
A. S. Mason, Assistant Dean, Ph.D. Tennessee
The Space Institute was originated to interface University faculty research with the Arnold Engineering Development Center of the United States Air Force, Located at Tullahoma, Tennessee, the Space Institute offers graduate degree programs with majors in Aerospace Engineering, Aviation Systems, Computer Science, Electrical Engineering, Engineering Science, Mathematics, Mechanical Engineering, and Physics. In addition to the fundamental academic work characteristic of each discipline, research opportunities and supporting interdisciplinary course work are available to permit specialization in many aspects of atmospheric and space flight such as subsonic to hypersonic aerodynamics, aerospace vehicle design, control and guidance, modern materials and structures, propulsion systems, aircraft noise and sonic boom, flight simulation, avionics, plasmadynamics, flow diagnostics including spectroscopic and electrooptic means, systems management and cybernetics. Work is also in progress in remote sensing and the magnetohydrodynamics of coal utilization. Course and research work in related areas of environmental pollution control, earth resources, energy conversion, materials and systems and simulation are also available. The research personnel and facilities of the Institute and those available at the Arnold Center through appropriate contractual arrangements provide an outstanding opportunity for meaningful research in these and other areas. Students who enroll at UTMSI must be admitted to the Graduate School, University of Tennessee, Knoxville. Further information concerning the Institute may be obtained from the Dean, The University of Tennessee Space Institute, Tullahoma, Tennessee 37388.

The Institute is operated by The University of Tennessee in close cooperation with numerous departments at The University of Tennessee, Knoxville and the office of the Vice Chancellor for Graduate Studies and Research.

Water Resources Research Center
F. C. Larson, Director, M.S. Virginia Polytechnic

The Water Resources Research Center is the federally-designated organization for water research for the state. In addition to research carried out by its staff, it coordinates and promotes water research of all kinds in the state and supports projects by dispensing competitive funding and by facilitating the applications of researchers from all institutions in the state for federal and private funds.

The Center also has a mission in graduate education through the M.S. degree program in Water Resources Development described elsewhere.

The Center is operated by The University of Tennessee, Knoxville through the office of the Vice Chancellor for Graduate Studies and Research.

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 Doctoral level. The program is operated within policies set by the Graduate Council of The University of Tennessee and is administered by the Vice Chancellor for Graduate Studies and Research.

Students who enroll in this program must be admitted to the Graduate School of The University of Tennessee, Knoxville.

Information and appropriate application forms may be obtained from the Director, Kingsport University Center, The University of Tennessee, University Boulevard, Kingsport, Tennessee 37660.

Oak Ridge Resident Graduate Program: The University of Tennessee offers graduate study programs at Oak Ridge, with work leading to Master of Science in Industrial Management, Industrial Education, and Statistics; the Master's and Doctoral degrees are available in Engineering, Mathematics, and Physical and Biological Sciences. Courses are given in the late afternoons, evenings and Saturdays, with research facilities provided by and used in cooperation with the Oak Ridge Associated Universities and the Union Carbide Corporation Nuclear Division.

This program is supported under a subcontract with Oak Ridge Associated Universities with principal support coming from Union Carbide Nuclear Division. The University of Tennessee is one of the forty-three colleges and universities which sponsors ORAU, a nonprofit education and research management corporation.

Information and applications to the Graduate School may be obtained by writing the Director, UT-Oak Ridge 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 areas 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.

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 at Nashville: Opportunities for graduate study leading to the degree of Master of Science in Civil Engineering, Engineering Administration, and Industrial Engineering are offered by The University of Tennessee, Knoxville and are administered by the Vice Chancellor for Graduate Studies and Research.

Students who enroll in those programs must be admitted to The University of Tennessee, Knoxville Graduate School. Information and appropriate forms may be obtained from the Registrar, The University of Tennessee, Tenth and Charlotte, Nashville, Tennessee 37203.

The University of Tennessee-Oak Ridge Graduate School of Biomedical Sciences: The University provides programs leading to the M.S. and Ph.D. degrees in various areas of biomedical sciences. Graduate students have the opportunity to study and to do research in conjunction with the Biology Division of the Oak Ridge National Laboratory.

For complete information concerning the program, see page 149.

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

For complete information concerning the program, see page 158.

Admission and Registration

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

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

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

If an applicant does not enter Graduate School the 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 reapply must submit a new application and fee.

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

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

Doctoral 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 Transient Form which may be obtained from the Graduate School. Application for admission must be completed prior to registration. A student may not register for more than 18 hours of total credit while enrolled for 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 16 credit hours per quarter during 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 the 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. Evaluation of these restrictions through temporary resignation, acceptance of a lower rank, or leave of absence is not allowable. A faculty member may, however, do graduate work on a non-degree basis.

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

An applicant must present:

1. a complete and accurate chronological outline of all previous university-level education;

2. authorized school or university records, with official translations if the records are in a language other than English;

3. evidence of financial resources sufficient to provide him/her with at least $4900 (U.S.) per academic year during the period of registration as a student; and

4. certification of good character and moral standing.

Every international student must either submit a score of at least 525 on the Test of English as a Foreign Language (TOEFL), taken within the last two years or have received a Bachelor's Master's degree from an institution in the United States 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/her 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.

All students 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 1221.
Examinations

Applicants for admission to many of the degree programs are required to submit scores from the Graduate Record Examination or the Graduate Management Admission Test. (Refer to pages 8-9 for majors requiring these examinations.) Each applicant is individually responsible for arrangements for the examination and for transmission of these scores directly from Educational Testing Service to the Vice Chancellor for Graduate Studies and Research. Application forms may be obtained from Educational Testing Service, Princeton, New Jersey 08450, or from the UT Graduate School Office.

The completed application form and examination fee must reach 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. Retroactive registration is not permitted.

 Fees, Financial Aid, and Fee Classification

University Fees

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

APPLICATION FEE: $10.00

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

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

MAINTENANCE FEE (all students):

PER QUARTER $160.00

TUTION (additional for out-of-state students):

PER QUARTER $312.00

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 $55.00 per quarter hour or fraction thereof; minimum charge $156.00

All fees collected at registration are subject to audit for correctness. Adjustments, if needed, will be made after final audit.

UNIVERSITY PROGRAMS AND SERVICES FEE:

PER QUARTER $15.00

All graduate students taking in excess of 6 quarter hours per quarter will be assessed a University programs and services fee of $15 per quarter. Part-time students taking 6 quarter hours or less will be assessed at the rate of $1 per quarter hour or fraction thereof; minimum charge $3.

The fee for the summer quarter will be $12. Part-time students taking 6 quarter hours or less will be assessed at the rate of $1 per quarter hour or fraction thereof; minimum charge $3.

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

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

Students taking a course load of 6 hours may elect to pay the full programs and services fee.

This fee is not refundable.

LATE REGISTRATION FEE:

All students are required to have a validated fee receipt to complete the registration procedure. This includes students whose fees are billed, prepaid, or waived. Students who do not complete registration on the regular dates scheduled for this purpose will be charged a late registration fee of $2 up to $43. See the University General Catalog for application of this fee. The payment of fees with a check which is not honored by the bank will incur a service charge of $10 to $43, depending on the date the check is redeemed.

MUSIC FEE:

One half-hour lesson per week, per quarter $8.00

One-hour lesson per week, per quarter $12.00

Payable by students receiving individual instruction in music.

GRADUATION FEE:

Master's degree candidates $16.00

Doctoral degree candidates $41.00

There is no additional charge for diploma, binding, or microfilming.

DEFERRED PAYMENT SERVICE FEE: $3.00

This fee is applicable when the payment of any part of a student's account is deferred, including accounts which must be billed to outside agencies, organizations, and institutions. This fee is also applicable when any additional charge (out-of-state tuition, music fee, room and board adjustments) 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 are considered as one-hour courses.

REFUND OF FEES FOR WITHDRAWAL:

Upon receipt of a class schedule 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 Withdrawal Office because space in a class section is reserved until released. The minimum of 20 percent of fees will be charged even if classes are not attended, unless the Withdrawal Office is notified before the first official day of classes for the quarter. Failure to notify the Withdrawal Office promptly when withdrawing could result in a larger percentage fee assessment. The effective date of withdrawal is the date the Withdrawal Office is notified by completion of the official withdrawal request form.

For a regular academic quarter, withdrawal within 7 calendar days beginning with the first day following regular registration permits an 80 percent fee refund. Withdrawal between 8 and 14 calendar days following regular registration permits a 60 percent fee refund. Withdrawal between 15 and 21 calendar days following regular registration permits a 40 percent fee refund. Withdrawal between
SUMMER QUARTER FEES AND EXPENSES:

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

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

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

WAIVER OF FEES:

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

Fee Classification for the Purpose of Paying University Fees

Shortly after a student applies to the Graduate School, notification of the receipt of the application, application fee, and residency classification for fee purposes is sent.

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

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

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

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

(3) Upon moving to this state, an emancipated person who provides persuasive evidence of domicile may apply for in-state classification for said person's unemancipated children: and provided that said person is not in this state primarily as a full-time student, the unemancipated children may be considered classified, and may continue to be so classified so long as said person remains domiciled in this state.

(4) Any person who resumes in the state when the parent, having theretofore been domiciled in this state, removes from this state, shall be entitled to classification as an in-state student so long as attendance at a school or schools in this state 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, Kentucky, pursuant to military orders shall be classified as an out-of-state student but shall not be required to pay out-of-state tuition. The student, while in continuous attendance toward the degree for which he/she is currently enrolled, shall not lose his/her residence when the parent thereafter is transferred on military orders.

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

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

(1) 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 person shall be determined by the provisions of these regulations independent of the residence of the spouse.

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

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

Appeal. The student who wishes to appeal his/her initial residency classification 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 so classified, the in-state residency classification shall be effective at the beginning of the quarter or semester in which application for reclassification was submitted.

Student Financial Aid

The University of Tennessee offers a comprehensive program of financial aid for full-time students who otherwise would not be able to attend the University. Through this financial aid program an eligible student may receive one or more types of assistance to help pay college expenses.

Financial need is defined as the difference between a family's resources and the total expenses of attending the University. If there is a deficit, the student is considered to be in need of financial assistance. To assist in determining the need for financial aid, The University of Tennessee utilizes the need analysis system of the College Scholarship Service (CSS). Through the use of the CSS form and the Financial Aid Form (FAF), the Financial Aid Office determines the amount the parents and students could generally be expected to contribute toward meeting educational expenses. For more detailed information on the determination of need, please refer to the financial aid section entitled "Financial Assistance for Students."

The University of Tennessee has two basic types of financial aid for graduate students—loans and part-time employment. These may be awarded individually or in combination according to the needs of the student.

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 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 Graduate Office. Information concerning many national competitions for fellowships and scholarships supported by non-University
Student Loans

National Direct Student Loans. Long-term loans are available primarily through the National Direct Student Loan. 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 the 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 five years while the borrower is serving in the Armed Forces, Peace Corps, or Vista. Interest is 3 percent per year on the unpaid balance. The maximum repayment period is 10 years with the current minimum annual repayment of $100.00 or 10 percent of the accumulated loan, whichever is greater.

If upon graduation the student becomes a full-time teacher in a public or non-profit school which is designated by the commission as having a high enrollment of low-income families or becomes a teacher of the handicapped, 15 percent of the total principal plus interest is cancelled for the first two years of teaching, 20 percent for the third and fourth years, and 30 percent for the fifth year. If after graduation the student becomes a member in a preschool program which is operated for a period comparable to a full school year, 15 percent of principal plus interest will be cancelled for each year of service. Cancellation for up to 60 percent of the loan will also be given at the rate of 121/2 percent of the total principal plus interest 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 legislative action.

The University of Tennessee Student Loans. Student loans from University sources are available to currently enrolled students with a 2.0 or above cumulative grade point average. A loan of up to $250 per quarter to an annual maximum of $750 can be extended. One surety or cosigner is required for each promissory note and a new promissory note must be completed for each loan installment. The interest is 3 percent per annum payable annually on the anniversary date of the note. The loan is made for a specific time period and is due at the end of a stated number of years from the date of the note.

Extensions may be obtained if academic studies are continued at the graduate level. The borrower may, without penalty, pay all or part of the loan at any time before the maturity date.

Nursing Student Loans. The Nursing Student Loan is available to students who are enrolled or admitted as students in a course of study leading to a baccalaureate or graduate degree in nursing and who show need of assistance in order to pursue their course of study. The program provides a long-term, low-interest loan with repayment beginning nine months following termination of half-time study at an accredited school of nursing. Repayment may also be deferred for a period up to three years while the borrower is serving in the Armed Forces or Peace Corps or up to five years for a full-time course of study leading to advanced professional training. If upon graduation the student becomes employed full-time as a registered nurse in a public or non-profit private agency or institution, up to 85 percent of the principal may be canceled at the rate of 15 percent of the loan that was unpaid on the first day of employment plus interest for the first three years of employment and 20 percent for the fourth and fifth year. A Nursing Student Loan, or any other educational loan will be repaid by the U.S. Department of Health, Education and Welfare if the nursing graduate enters into an agreement to serve as a full-time registered nurse for a continuous period of at least two years in an area designated as having a shortage of nurses. Thirty percent of principal and interest will be cancelled for the first two years of service and 25 percent for the third year. The above regulations and provisions of the Nursing Loan Program are subject to change by legislative action.

Student Employment

Two employment programs are administered in the Financial Aid Office to help students find part-time employment.

The College Work-Study Program is a federal work program which provides jobs for students who have financial need and who must earn a part of their educational expenses. Eligible students are placed in jobs on- or off-campus where they work approximately 15 hours per week.

The Student Employment Service operates as a central referral agency. It coordinates listings of part-time employment from both University and private employers with the requests of students seeking part-time employment. Referrals are made in accordance with the student's skills and qualifications. Part-time jobs average from 15 to 20 hours per week.

Spouses of full-time students or students not enrolled full-time in the University should contact the Office, 1900 Terrace Avenue, The University of Tennessee, Knoxville, 37916, concerning employment.

Other Assistance

Guaranteed Student Loans to help meet educational expenses may be available through the federal government or a state guaranteeing agency. Local banks or credit unions can determine participation in the program. To receive the loan, one must be admitted to or in regular full-time attendance in good standing at the University. Interest on such loans is paid by the federal government while the student is in school if the student is eligible for interest benefits. During the repayment period which begins not later than nine months after graduation or withdrawal from the University, the student pays up to 7 percent simple interest.

Total loans outstanding may not exceed $10,000 for the graduate student.

Complete information is available at most banks and credit unions. In the state of Tennessee, write the Tennessee Student Assistance Corporation, 707 Main Street, Nashville, Tennessee 37206.

Application Procedures

Because a student's resources can decrease and increase significantly during an academic year, the University requires each student to apply annually for renewal of financial aid.

(1) Complete and submit the Application for Student Financial Aid on or before April 1.

(2) Complete and submit a Financial Aid Form to the College Scholarship Service approximately three weeks prior to the priority deadlines.

Financial aid programs, policies, and procedures are subject to annual change. Therefore, those interested in applying for financial aid should refer to the current information brochure, “Financial Assistance for Students,” distributed by the Financial Aid Office.

Applications for financial aid can be obtained by writing to The Financial Aid Office, 301 Student Services Building, The University of Tennessee, Knoxville, Tennessee 37916.

Veterans' Benefits

The Office of the Registrar administers the University's responsibility for programs of the Veterans Administration. Each veteran or eligible dependent 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

Housing

Single Men and Women: Single graduate students are provided excellent accommodations in both traditional and modern facilities which are conducive to academic achievement and personal development. Single graduate students have the same priority as other single students and may be assigned to any residence hall. Some
The University of Tennessee endeavors to provide adequate facilities for the increasing number of vehicles being operated by students and staff. However, because of the constant need to expand the teaching and research facilities for an ever-growing student body, the areas available for parking are necessarily limited. In an effort to provide parking facilities and to reduce traffic congestion within the campus area, large student parking areas are located on the perimeter of the campus. The University provides an intracampus bus system connecting these parking areas with the main campus at no cost to the student. Staff parking areas are located throughout the campus.

Each person who operates a motor vehicle in connection with attendance or employment at the University must register that vehicle with the traffic section of the Security Department. A University Traffic and Parking Authority determines the parking policy, traffic regulations, and fees, and this information is published each year in the "University Traffic and Parking Regulations."

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

Any staff member or student who has

failed to pay traffic citations is subject to disciplinary action up to and including termination or dismissal from the University.

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

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

**Computing Center**

The University of Tennessee Computing Center (UTCC), the largest computing facility in the University of Tennessee System, provides computing facilities and services for the needs of the University's teaching, research, public service, and administrative activities. In particular, UTCC maintains close contact with the UTK academic system by supporting research and instructional uses with professional computer staff.

UTCC is principally located in the Stokely Management Center and in Andy Holt Tower. From the Stokely location, UTCC supplies computing services to all campuses in the UT System through job entry facilities located on each campus. At UTK, UTCC maintains five job entry stations for batch work and six sites for interactive computer work.

UTCC's equipment consists of an IBM 360/65 and a DEC system-10 which are used for research, instruction, and administrative computing work. UTCC also maintains an IBM 360/40 which is used exclusively for administrative work.

UTCC publishes a *User's Guide* which describes the use of the IBM 360/65 and policies and procedures and the DEC system-10 *Programmer's Guide*, which is a general introduction to the use of the DEC system-10. The two guides are available at the UT Book and Supply Store. UTCC also publishes a monthly *Newsletter* which announces systems, equipment and procedural changes and contains other items of interest to the user community. Program writeups and special user's guides are also published.

UTCC periodically offers intensive training seminars of several days duration in computer utilization on the IBM 360/65 and the DEC system-10. These seminars are planned primarily for faculty, staff, and graduate students who use or plan to use UTCC facilities. UTCC offers non-credit short courses each quarter in topics such as programming languages and special purpose programs. These courses are announced in the Newsletter and in the "UT Notes" section of the *Daily Beacon*.

Computing services can be requested via the Request for Services form available from the business office in Stokely Management Center. All users of UTCC facilities are assigned a consultant to provide user assistance.

**Office of International Student Affairs**

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

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

Orientation programs are held at the beginning of each term, and international students are urged to attend them. International students applying for admission should write to: The Vice Chancellor for Graduate Studies and Research, The University of Tennessee, Knoxville.

**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 an activity center where domestic and international students may come together to relax and discuss matters of mutual interest. The small library at "I" House contains books and periodicals from all over the world.

**The University Library**

The University of Tennessee, Knoxville Library owns approximately 1,332,800 volumes, 1,332,000 microfilms, 48,000 microfilm reels and 1,000,000 items of other microtext, plus recordings, tapes, United States and United Nations documents, and more than 20,000 periodicals and other serial titles, which are received annually. The library's membership in the Association of Research Libraries indicates the University's emphasis on research and graduate instruction at the doctoral level and the support of large, comprehensive collections of library materials on a permanent basis.

Interlibrary loan service augments the UTK Library research holdings for faculty and graduate students. The service 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. Hoskins (Main) Library and its five branches: Agriculture, Law, Music, Science-Engineering, and the John C. Hodges Undergraduate Library. Special Collections, located in the Main Library, is a repository of regional and local ma-
terials, Tennesseana, and other specialties, including the legislative papers and mem-
ments of many Tennessee political
figures, and the Radiation Biology Archives
which houses the files of a group of
internationally renowned scientists. Its
materials are of particular interest to
scholars in the fields of history, political
science, social sciences, biological
sciences, and the arts.

The libraries located on the statewide
campuses in Chattanooga, Martin, Mem-
phis, Nashville, and Tullahoma are indi-
vidually administered; all libraries of The
University of Tennessee are accessible to
all students and faculty in the system.

General Regulations of
the Graduate School
Responsibility
A graduate student must assume full
responsibility for knowledge of rules and
regulations of the Graduate School and
departmental requirements concerning the
individual degree program. A statement
on Graduate Students’ Rights and Re-
 sponsibilities is printed on the back of the
student’s Admission Status Form. Addi-
tional copies are available at the Graduate
Office.

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

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

Graduate Credit
No student may receive graduate credit
for a course unless properly admitted to
the Graduate School. It is expected that
students will be so admitted prior to
registration for courses carrying graduate
credit. In some instances, however, stu-
dents who appear to meet the criteria for
admission are allowed conditional registra-
tion for graduate credit after filing an
application for admission to the Graduate
School and paying the application fee.
Transcripts (two official copies) and addi-
tional 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
the courses. 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 card will
show all courses for which registration has
been completed except those from which
the student withdraws during the first 5
calendar days after the beginning of
classes.

Students who fail to attend the first
class meeting without prior arrangement
with the department may be dropped from
the course to make their spaces available
to other students. Students have the re-
 sponsibility to assure that they have been
dropped; otherwise, they are liable
for a grade of F in the course.

The deadline for change of registration
(from credit to audit, audit to credit, gradu-
ate to undergraduate, undergraduate to
graduate, withdrawal, etc.) is set at mid-
quarter, approximately 35 calendar days
after the first day of classes each quarter.
A student may change registration from a
course at any time up to and including
date by executing a change of registration
slip and submitting this to the Graduate
Office. The advisor’s signature is not re-
quired. 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 from a course or
from the University occurs after the first 5
days 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 the request for withdrawal is based
on circumstances beyond the student’s
control.

Examples of circumstances beyond the
student’s control are:
  a. Illness or injury of the student
     (verified by the Student Health Service
     or private physician);
  b. Necessary change in work schedule
     occurring after the drop deadline
     (verified by the student’s employer).

Examples of causes which are within
the student’s control and which would not
be acceptable to grant withdrawal per-
mission are:
  a. Improper registration on the part of
     the student;
  b. Failure to achieve academically.

A student wishing to withdraw from a
course, or from the University, after
the withdrawal deadline, or change his or
her registration shall present the request,
together with evidence of extenuating cir-
cumstances, to the Graduate Office. If
the request is approved, the Graduate Office
will notify the Office of Admissions and
Records, which will enter the grade(s) of
W or the appropriate change on the stu-
dent’s permanent record.

Maximum Load
All graduate students are urged to
register each quarter for only that number
of hours which they can successfully com-
plete. The maximum load for a graduate
student is 15 hours, and 9 to 12
hours is considered a full load. Registra-
tion for more than 15 hours during any
quarter including the summer quarter is
not permissible without prior approval of
the Vice Chancellor for Graduate Studies
and Research, who may allow registration
of up to 18 hours if the student has
achieved an average of 3.6 or better
in at least 9 hours of graduate work.
Graduate assistants or others who have
part-time duties with the University are
expected to enroll for no more than an
appropriate fraction of the maximum load.

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

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

Grades
Grades in the Graduate School have the
following meanings:

A — (4 quality points per quarter hour);
B+ — (3.5 quality points per quarter hour);
B — (3 quality points per quarter hour);
B- — (2.5 quality points per quarter hour);
C+ — (2 quality points per quarter hour);
C — (1 quality point per quarter hour);
D — (no quality point value); indicates
extremely unsatisfactory work and
cannot be used in a graduate program.
F — (no quality point value); indicates
satisfactory work.
I — (no quality point value); indicates
that the student has done satis-
factory work in the course, but—
because of circumstances beyond
control—has been unable to finish all
requirements. It is not to be given to enable a student to do additional work to bring up a deficient grade. All incomplete must be removed within two quarters. If a supplementary grade report has not been received in the Graduate Office at the end of the second quarter, the I will be converted to an F. The incomplete will not be counted in the cumulative average until a grade is assigned. No student may graduate with an incomplete on the record.

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

Graduate students are required to make an overall minimum grade average of B. No course taken for graduate credit will be recorded as S/N. A minimum of 45 graduate hours is required for a Master's degree. A student in residence is devoting essentially all his/her energies to graduate study. The enrollment does not count toward this requirement.

Consecutive quarters include the summer quarter.

Revision of Program

A student who wishes to revise a major program of study must complete a "Request for Revision of Graduate Program" form which can be obtained from the Vice Chancellor for Graduate Studies and Research. The approval must be regularized through the head of the department in which admission was previously granted. A signature is needed if a student is requesting a change from non-degree to a degree program or from one degree to another in the same department.

Time Limit

The time limit for the use of graduate credit toward a Master's degree is six years from the beginning date of the earliest course applied toward the degree. The last 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 course work hours required for the program 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. Courses, 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 a proficiency 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 9 quarter hours of law courses and receive credit toward a degree upon approval of the College of Law department committee chairman. DBA students may take a maximum of 12 hours.

Transfer Credits

A maximum of 12 quarter hours (6 semester hours) may be transferred into a student's Master's program of study accepted at accredited institutions. (Extension courses at other universities are not applicable.)

One-half of a student's program may be transferred from within the University of Tennessee System. Such work must have been taken for graduate credit and passed with a grade of B or better, be part of an otherwise satisfactory graduate program (B average) but not used toward another degree, and be listed on the Admission to Candidacy Form approved by the committee members and the Vice Chancellor for Graduate Studies and Research. Ordinarily, course work from foreign institutions is not transferred since these institutions have not been accredited. This course work must be completed within the six-year period prior to the receipt of the degree. The same rule applies also to the Specialist in Education Degree. Courses transferred into a student's Master's program may consist of a combination of University of Tennessee System courses and courses from other institutions so long as the total accepted does not exceed one-half the total program, and courses accepted from outside the University of Tennessee System do not exceed 9 quarter hours.

Transfer credits will be placed on the University of Tennessee transcript only after the student has been admitted to candidacy.

Courses taken for graduate credit at another institution and passed with a grade of B or better from a satisfactory graduate program (B average) may be accepted in a student's doctoral program. The number of hours a student may include will be determined by the doctoral committee.

They must be listed on the Admission to Candidacy form and approved by the committee members. Although the hours may be used as part of the requirements for the degree, the courses will not appear on the University of Tennessee transcript record.

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

Credits accepted in either the Master's or doctoral 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 its graduate program. If the form of the thesis is not thus approved, the student must make whatever corrections are necessary and submit the materials again.

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

**Requirements for Advanced Degrees**

**Master's Degrees**

Master's degree programs offered in the Graduate School are listed under "Majors and Degrees Available" on page 8-9. See also chart, page 50, for summary of procedures for these degrees.

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

**Course Requirements:** A candidate for a Master's degree must present a total minimum credit of 45 quarter hours of approved graduate courses. These hours may be entirely in one major subject or may include one or two minors. If approved by the student's faculty advisory committee and the Vice Chancellor for Graduate Studies and Research, the major subject must include at least 18 quarter hours credit of course work except in the MBA degree program. A minor shall consist of not less than 9 or more than 18 quarter hours of course work.

All courses for which a student registers must be completed (unless officially dropped) before graduation. At least one-half of these total hours in the graduate program must be at the 5000-level, of which no more than 9 may be thesis hours. These courses must be completed at The University of Tennessee. (5000- and 6000-numbered courses are open to graduate students only — 3000- and 4000-numbered courses may be taken for graduate credit if listed in the Graduate School Catalog.)

The Master of Arts in College Teaching requires 60 quarter hours, 9 hours of which must be devoted to the preparation of a thesis or dissertation. These courses must be completed at The University of Tennessee. (5000- and 6000-numbered courses may be taken for graduate credit if listed in the Graduate School Catalog.)

The Master of Arts in College Teaching requires 60 quarter hours, 9 hours of which must be devoted to the preparation of a thesis or dissertation. These courses must be completed at The University of Tennessee. (5000- and 6000-numbered courses may be taken for graduate credit if listed in the Graduate School Catalog.)

The Department of Educational Leadership and Counseling requires 60 quarter hours, 9 hours of which must be devoted to the preparation of a thesis or dissertation. These courses must be completed at The University of Tennessee. (5000- and 6000-numbered courses may be taken for graduate credit if listed in the Graduate School Catalog.)

**Thesis Registration:** A minimum of 9 quarter hours and, in some approved programs, a maximum of 18 quarter hours of credit (course number 5000 which is variable credit) in the major may be earned in the preparation of an acceptable thesis, represented by a final, in-semester research paper. A student must be registered for a thesis course each quarter work is being pursued on the thesis. If the thesis is not completed during the quarter in which the student registers for the last 3 hours of 5000, the candidate shall continue to register for a minimum of 3 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 the problems are used in lieu of the thesis.

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

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

The examination is not merely a re-examination of course work, but it is a test of the candidate's ability to integrate material in the major and related fields, including the work presented in the thesis. This examination, which must be scheduled through the Graduate Office, shall be held at least ten days before the final quarter preceding the quarter in which the candidate is expected to graduate. The candidate also spends six quarters as a part-time teaching intern. The emphasis in the program will be on training prospective teachers of undergraduate courses. Participating departments are indicated in the list of "Majors and Degrees Available" on pages 8-9.

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

**Admission to Candidacy:** Application for admission to candidacy for the Master's degree is made after the student completes any required prerequisite courses and at least 15 hours of graduate course work with a B average in all courses taken for graduate credit. Approval of the Vice Chancellor for Graduate Studies and Research is required. The student must submit the Admission to Candidacy form, with appropriate signatures, to the Graduate Office no later than commencement day of the quarter preceding the quarter in which he/she plans to graduate. The result of the second examination, the candidate may appear for reexamination until the following quarter. The result of the second examination is final.

**Final Examination for Non-Thesis Students:** A non-thesis student must pass a final written examination on all work offered for the degree. The department may or may not follow this examination with an oral examination. The examination is not merely a re-examination of course work, but it is a test of the candidate's ability to integrate material in the major and related fields. This examination must be scheduled through the Graduate Office in accordance with the Graduate School News deadlines. This examination will be conducted by a committee of no fewer than three faculty members, with the student's major professor as chairman. In case of failure of the final examination, the candidate may not appear for re-examination 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 the deadline, 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.

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. Nine hours of work beyond the Master’s degree shall include a minimum of two members from the department or area of specialization. See chart, page 21 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. Nine hours of work beyond the Master’s degree shall include a minimum of two members from the department or area of specialization. See chart, page 21 for summary of procedures for this degree.
may be transferred from approved institutions and may be used to meet the student's course requirements. (See Transfer Credits, page 18.)

For a student admitted to the program with a Master's degree or an 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 the work are met; 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 the program. At least 22½ of the last 45 hours of course work, exclusive of the thesis or problems, must be in 5000- or 6900-level courses. The last 45 hours of a student's program (including thesis or problems) must be completed within six years.

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

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

A minimum of 9 hours of research credit (5180, 5190, and 5200) is required. If the student does not complete the research during the first quarter registered for 5200, the student must continue to register for this course (minimum of 3 hours) each quarter as long as active work on the thesis continues or until the thesis is accepted by the Graduate School. The thesis is to be prepared according to the instructions in the Graduate School Thesis and Dissertation Manual. It should be approved by the committee prior to submission and must be submitted by the appropriate date the quarter the student wishes to graduate.

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

### 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 for Graduate Studies and Research</td>
<td>After submission of Revision Form</td>
</tr>
<tr>
<td>Submission of application for admission to candidacy (obtain forms from the Graduate Office)</td>
<td>Major professor and Vice Chancellor for Graduate Studies and Research</td>
<td>At least one quarter prior to graduation*</td>
</tr>
<tr>
<td>Approval of admission to candidacy</td>
<td>Vice Chancellor for Graduate Studies and Research</td>
<td>Prior to Commencement</td>
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### GRADUATION REQUIREMENTS

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

* Dates are printed in Graduate School News quarterly.
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 Doctoral degree, the highest in-course degree, is awarded in recognition of distinctive scholarship and the completion of a research project which is a significant contribution to knowledge.

Doctoral programs include a field of specialization and often study in one or more collateral fields. The selection of specific courses will be determined by each student's faculty committee, subject to regulations of the Graduate School and approval by the Vice Chancellor for Graduate Research, be granted a leave of absence for the entire period during which the person is actually working on research and dissertation, including the quarter in which the dissertation is accepted by the Graduate School. Two copies of the dissertation (prepared according to the regulations given in the Graduate School Thesis and Dissertation Manual) must be submitted to and approved by the Graduate School. These copies must include an approval sheet, signed by all members of the faculty committee, which certifies to the Vice Chancellor for Graduate Studies and Research that they have examined the final copy and found its contents to be satisfactory. Doctoral forms and a thesis card are also submitted at this time. The student should check with the department head concerning additional required copies of the dissertation.

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

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

**Admission to Candidacy:** A student may be admitted to candidacy after passage of the preliminary examinations, fulfillment of the language requirements (for Ph.D.), and maintenance of at least a B average in the courses. (Each doctoral student must plan to take an appropriate number of 6000-level courses, usually a minimum of 9 quarter hours, which are designated expressly for doctoral students at the University of Tennessee, during the program of study. These courses cannot be transferred from another institution.)

Admission to candidacy must be secured at least three quarters prior to the date the degree is to be conferred. Each student is responsible for filing an 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 for every candidate for the Doctoral 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 ten days 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 3 hours) for the entire period during which the person is actually working on research and dissertation, including the quarter in which the dissertation is accepted by the Graduate School. Two copies of the dissertation (prepared according to the regulations given in the Graduate School Thesis and Dissertation Manual) must be submitted to and approved by the Graduate School. These copies must include an approval sheet, signed by all members of the faculty committee, which certifies to the Vice Chancellor for Graduate Studies and Research that they have examined the final copy and found its contents to be satisfactory. Doctoral forms and a thesis card are also submitted at this time. The student should check with the department head concerning additional required copies of the dissertation.
# Summary of Procedures for Doctoral Degrees

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

## GRADUATION REQUIREMENTS

| Placement of name on graduation list          | Student                                                | Indicate on registration material         |
| Application for diploma                      | Vice Chancellor for Graduate Studies and Research       | See deadline notice available at registration** |
| Scheduling of oral examination               | Faculty committee and Vice Chancellor for Graduate Studies and Research | When approved by faculty committee and at least one week prior to oral examination** |
| Submission of dissertation to faculty committee | Faculty committee                                      | At least two weeks prior to oral examination |
| Oral examination                             | Faculty committee                                       | Not later than ten days before dissertation deadline** |
| Removal of incompletes                       | Instructor of course                                    | Not later than one week before Commencement** |
| Submission of final copy of dissertation, doctoral forms, and thesis card | Faculty committee and Vice Chancellor for Graduate Studies and Research | After oral examination and at least two weeks before Commencement** |

* The order of these items varies with individual programs.
** Dates are printed in Graduate School News quarterly.
*** Not required in some programs.
Institute of Agriculture

Webster Pendergrass, Vice President
Bobby H. Pentecost, Assistant Vice President

The Institute of Agriculture traces its history to 1869 when the University was designated as Tennessee's Federal Land-Grant Institution. Under terms of the Federal Land-Grant Act, the University was enabled to offer instruction in agriculture and the mechanic arts for the first time. Since 1869, agricultural programs at the University have been expanded to include research for the development of new knowledge and extension for dissemination of such knowledge to rural people. Thus the Institute of Agriculture has come to include the work of three main divisions: College of Agriculture, Agricultural Experiment Station, and Agricultural Extension Service.

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

Agricultural Experiment Station

D. M. Gossett, Dean
Thomas J. Whaley, Associate Dean
John I. Sewell, Assistant Dean

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

The program is designed and administered through sixteen subject matter departments located at Knoxville. A number of the staff have teaching responsibilities in addition to their research. To assist in the research program the Station supports a large number of graduate students. To serve Tennessee's diverse agriculture, branch stations are operated at Jackson, Spring Hill, Springfield, Lewistown, 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 twenty 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 radiobotany and plant breeding.

Agricultural Extension Service

M. L. Downen, Dean
T. W. Hinton, Associate Dean
B. G. Hicks, Assistant to the 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 ninety-five 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 information fields by a specialist staff, members of which are stationed either in Knoxville, Nashville or Jackson.

The Agricultural Extension Service operates administratively as one of 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
College of Agriculture
O. Glen Hall, Dean

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

MASTER OF SCIENCE PROGRAMS

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

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

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

Each program of course work and thesis research is planned by the major professor and Master's committee in consultation with the student, and will depend upon the student's background, interests, and professional objectives. For example, a student majoring in 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 6 hours of graduate work in a subject before pursuing a special problem in lieu of thesis in that field. Problems in lieu of thesis will be written to meet normal thesis standards of quality.

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

- 48 hours of course work of which 24 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

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 and economics combined must be in courses numbered 5000 and above.

Agricultural Engineering

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

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

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

Additional course requirements for the degree are:

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

2. A minimum of 30 quarter hours credit will be in courses numbered 5000 and 6000, exclusive of Doctoral Research and Dissertation.

3. The program of each candidate shall consist of a major and supporting studies in one or more additional areas. The major shall consist of a minimum of 24 quarter hours exclusive of research and dissertation. A minimum of 24 quarter hours shall be taken in departments outside of the Department of Agricultural Engineering.

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 6000 Doctoral Research and Dissertation.
2. At least 36 quarter hours credit in courses numbered 5000 and 6000, exclusive of Doctoral Research and Dissertation.
3. A minimum of 24 quarter hours credit must be completed in related fields outside of animal science.

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

Plant and Soil Science

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

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

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

Some of the specific requirements for the degree are:

1. Minimum of 108 quarter hours credit beyond the Bachelor's degree exclusive of Master's thesis. Of this number, students are required to complete a minimum of 36 quarter hours in Doctoral Research and Dissertation.
2. Minimum of 30 quarter hours credit in courses numbered 5000 and 6000 exclusive of Doctoral Research and Dissertation.

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

Departments of Instruction

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

Agricultural Biology

MAJOR Agricultural Biology

DEGREE M.S.

Agricultural Economics and Rural Sociology

MAJOR Agricultural Economics M.S., Ph.D.

DEGREES

Agricultural Economics

Professors: J. A. Martin (Head), Ph.D., Minnesota; H. W. Brown, Ph.D., Iowa State; C. L. Cleland, Ph.D., Wisconsin; J. L. Johnson, Ph.D., Louisiana State.

Assistant Professors: L. Lambdin, Ph.D., Virginia Polytechnic Institute; C. B. Smith, Ph.D., Georgia.

3100 Introductory Plant Pathology (3) Principles of plant pathology illustrated by diseases of common agricultural crop plants. Prereq.: Introductory botany or zoology. Graduate credit for non-biology students. 3 hrs and 1 lab. (Same as Botany 3150.)

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

4010 Biology of Soil Microorganisms (4) A study of the morphology and physiology of soil organisms, decomposition of organic matter, chemical transformations, and interactions between soil organisms and higher plants. Prereq.: Introductory microbiology or 3150. 3 hrs and 1 lab.

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

5000 Thesis

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

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

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

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

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

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

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

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

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

Agricultural Economics

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

4140 Introduction to Agricultural Production Economics (3) Resource allocation, product selection, scale of operation of agricultural firms, economic bases of world agricultural production and trade patterns, land tenure systems, international trade and commercial policy in determining agricultural production and trade patterns. Prereq.: Consent of instructor.

4250 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 countries. Prereq.: Introduction to Social Sciences in Agriculture and Introductory Economics or consent of instructor.

4310 Agricultural Finance (3) Agricultural credit: nature and source of capital; credit problems of farmers; sources of farm capital; kinds and sources of farm credit, Agricultural insurance and taxation: kinds of insurance: importance of taxes to farmers.

4320 Agricultural Policies (3) Agricultural policy in democratic society; government policies, farm programs, farming policies, the role of government in agriculture; policy problems, political processes, and the agricultural policy making process. Prereq.: Consent of instructor.

4330 Land Economics (3) Problems and policies of land use, land values, taxation, and tenure; population growth and demand for land; principles and theories of rent, property, values, and income.

4610 Management of Farm Supply and Marketing Firms (5) Operation of firms selling
farming and merchandising agricultural products. Emphasis on accounting data and economic framework for managerial decision making.

4630 Advanced Agricultural Marketing (3) Theory of distribution organization and costs. Application of cost theory to the production organization of the marketing firm and problems of organizational, market organization, structures, and price policies. Application of imperfect competition theory to the marketing 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, taxes, drainage and water rights, landlord-tenant relationship, taxation and insurance, forms of business organization, estate planning, regulatory laws and other selected topics.

5000 Thesis

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

5011 Special Problems in Lieu of Thesis (3)

5120 Agricultural Price Analysis (3) Analysis and distribution of factors affecting agricultural prices: the study of agricultural production, economic interpretation of economic theory and statistical techniques to the agricultural price research. Prerequisites: 3120 and Statistics 4310 or equivalent.

5130 Advanced Agricultural Production Economics (3) The theory and empirical concepts of agricultural resource allocation problems under conditions of uncertainty. Prerequisites: 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 reporting 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. Prerequisite: 4050 or equivalent.

5420 Advanced Land Economics (3) Problems in land tenure, land use, and conservation in the United States and selected foreign countries. Prerequisite: 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 interdependence of agricultural development under conditions of economic change. Prerequisite: 4240 or consent of instructor.

5510 Quantitative Methods in Agricultural Economics (3) Study of analytical techniques useful in estimation of functions-supply, demand and production—and prediction of economic variables. Emphasis on the application of multiple regression model specification, estimation technique using computer for calculation of results. Prerequisite: Statistics 4310 or Economics 4510 or consent of instructor.

5710 Quantitative Methods in Agricultural Economics (3) Application of linear programming technique with empirical applications, made to problems of maximizing profit, minimizing cost, finite life; basis for development and design of facilities and structures for confined housing of animals, controlled environment for plant growth, and storage facilities for plant and animal products. Prerequisite: Functional Design of Agricultural Structures; Applied Thermodynamics; or consent of instructor. 2 hrs and 1 lab.

5340 Hydrology of Agricultural and Forest Lands (3) Analytical approach to problems involving water surplus, deficiency and their distribution as related to agricultural and forest purposes. Prerequisite: Soil and Water Conservation Engineering; Instrumental Hydrometry; Forest Watershed Management; or consent of Instructor. 2 hrs and 1 lab. (Same as Water Resources Engineering 5340).

5440 Instrumentation in Agricultural Systems (3) Analysis of specific instrumentation needs in agricultural industry and research problems; principles and design in utilization of specialized instrumentation. Prerequisite: Engineering Electronics or consent of instructor. 2 hrs and 1 lab.

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

5540 Agricultural Machinery Systems Analysis (3) Analysis of current field machinery; adaptation planning for sequential operations; operational management. Prereq: 4210. 2 hrs and 1 lab.

5580 Animal Science

MAJOR DEGREE

Animal Science M.S., Ph.D.

Professors: R. R. Johnson (Head), Ph.D. Oklahoma State;

M. C. Bell, Ph.D. Oklahoma State;

C. C. Chamberlain, Ph.D. Iowa State;

H. M. Jamison, Ph.D. Tennessee; J. B. McLaren, Ph.D. Kentucky; G. M. Merriman, D.V.M., Ph.D. Wisconsin; M. J. Montgomery, Ph.D. Wisconsin;

R. L. Murphree, Ph.D. Wisconsin;


E. R. Lidwall, M.S. Tennessee; F. B. Maslincup, Ph.D. Kansas State.

Associate Professors: W. R. Backus, Ph.D. Tennessee;

K. M. Barth, Ph.D. Rutgers; G. Bratton, D.V.M., Ph.D. Texas A & M.;

M. R. Knutts, Ph.D. Tennessee; N. Eiler, D.V.M., Ph.D. Illinois;

E. R. Lidwall, M.S. Tennessee; F. B. Maslincup, Ph.D. Kansas State.


J. W. Holloway, D.V.M. Oklahoma State;

S. Kincaid, D.V.M., Ph.D. Purdue; J. Oliver, D.V.M., Ph.D. Purdue; R. Schaub, Ph.D. Washington State;

J. D. Smalley, D.V. Texas A & M.

3210 Anatomy and Physiology of Farm Animals (4) Skeleton and joints, skeletal muscles, blood and microcirculation, and the nervous, cardiovascular, respiratory, renal and endocrine systems: demonstrations of physiologic 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, 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; nutritive value determinations and their use. Prereq: Animal Science for Agriculture and one quarter of organic chemistry. 2 hrs and 1 lab.

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

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

3420 Principles of Animal Breeding (3) Genetic principles in the breeding of economic species. Genetic basis of variation. Partitioning of variation according to various kinds of causative difference in genetic makeup and in environment. Selection and its consequences. Managing systems and techniques to optimize genotypes 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; their transmission and control against disease; veterinary regulations and quarantine; herd health programs. Prereq: General Microbiology or consent of instructor. 3 hrs and 1 lab.

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


Agricultural Extension Education

MAJOR DEGREE

Agricultural Extension M.S.

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

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

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

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

5000 Thesis

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

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

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

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

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

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

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

5330 Supervision of Agricultural Extension Programs and Personnel (3) Theories of human effectiveness; principles of successful supervision applied to various parts of county, district and other extension programs; and planning for effective extension management. Prereq: 5210 or 5220 or consent of instructor.
3810 Nutrition and Management of Laboratory Animals (3) Principles of feeding, breeding and handling of laboratory animals; specific species' requirements, peculiarities and research for which best fitted; laws governing use 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 and other factors affecting milk production and milk secretion; factors affecting yield and composition of milk. Prereq: 3210.

4220 Avian Physiology (3) Anatomy and physiology of the avian system 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; insensitization of females; pregnancy determination; gestation and parturition. Male and female infertility. Prereq: 3220. 1 hr and 2 labs.

4310 Feeding Systems for Ruminants and Horses (3) Nutrition and feeding principles in the 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 (breeding of important classes and species) taught by specialists in the breeding of dairy cattle, meat animals and poultry. Prereq: 3420. 2 hrs and 1 lab.

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

4820 Dairy Cattle Production and Management (4) Principles of nutrition, physiology and breeding in a complete dairy cattle management program. Topics will include the structure of industry, enterprise establishment, systems of production, production practices and herd improvement programs. Alternatives will be evaluated in terms of production response and economic returns. Prereq: 4210. 2 hrs and 1 lab.

5210 Endocrine Relations in Animal Production (4) Endocrine glands related to growth and reproduction; hormone preparation for altering growth rate and yield 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, and preservation; fertilization and embryonic mortality. Prereq: 3220 or 4230. 2 hrs and 1 lab.

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

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

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

5331 Proteins in Animal Nutrition (3) Proteins in feeds, amino acids and non-protein nitrogen; interactions of feed ingredients and their application to animal nutrition. Prereq: 3320 or consent of instructor.

5341 Vitamins and Minerals in Animal Nutrition (3) Nomenclature, history, identification, chemical properties, mode of action, determination, nutritional deficiency syndrome, sources and requirements. Prereq: 3320 or consent of instructor.

5410 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 study of current research in animal science analyzing data from experiments using appropriate statistical techniques. Prereq: 5710. 2 hrs and 1 lab.
slaughter, cutting, selection, curing, freezing

3840 Meat Science (3) Processing methods, carcass characteristics of meat animals; slaughtering, 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.

4050 Dairy Products II (4) Principles in the manufacture of 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.

4100 Food Plant Sanitation (3) Environment for manufacturing and preserving foods. 2 hrs and 1 lab.

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

4120 Food Additives (3) Substances used in food manufacturing with emphasis on properties and functions. Prereq: Food Analysis or equivalent. 2 hrs and 1 lab.

4130 Food Packaging (3) Characteristics and application of materials and containers to packaging requirements of food. Prereq: 3220. 2 hrs and 1 lab.

4140 Food Crop Products (3) Food products from crops with emphasis on types, manufacturing systems, quality attributes and utility.

4150 Microbiology in Food Manufacturing (3) Relationship of growth of common food microorganisms in fermentative and enzymatic chemical reactions occurring during processing and manufacturing of foods. Prereq: General Microbiology or equivalent. 1 hr and 2 labs.

4150 Fats and Oils (3) The application of scientific principles to commercial technology of fats and oils. Prereq: 3210. 2 hrs and 1 lab.

5000 Thesis

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. Prereq: Food Analysis. 2 hrs and 1 lab.

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

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

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

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

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

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

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

5510 Meat Technology (3) Physical and chemical changes that occur during the conversion of muscle to meat and the ultimate influence these changes have on quality and composition; meat inspection. Prereq: 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, isolation and characterization of microorganisms from food products and plant equipment. Prereq: 4810 or Microbiology 3810. 3 hrs.

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

Forestry, Wildlife, and Fisheries

DEGREES

MAJORS

M.B. Wildlife and Fisheries Science M.S.

Forestry

Associates:
B. L. Dearden, Ph.D. Emeritus

Professors:

Associate Professors:

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

Forestry

*3200 Forest Environments and Ecology (3) Environments and ecology of forests and associated ponds; emphasis on the application of ecological principles to contemporary problems. Prereq: 8 hrs of biology, botany, or zoology.


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

4002 Utilization (3) Wood-using industries; processing of forest products-sawmills, tree-loggers; pulpwood operations, flooring plants, furniture plants; plant layout, flow diagrams, equipment selection, design; field measurement, silvicultural data, timber cruising; determining appropriate sample design for specific purposes; tree and stand growth; site evaluation; field problems. Prereq: 3110.

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

4006 S/Utilcultural Methods (4) Methods and application of intermediate and regeneration cuttings; site preparation; application of cutting methods to obtain desired goals and benefits. Prereq: 4002, 4003.

4020 Forest Watershed Management (3) Water from forest resource; role of forests in the hydrologic cycle; control of water quantity, quality, and regimen; watershed planning. Prereq: 3110. Credit may be no credit or no credit for non-forest majors only.

* Graduate credit for non-forestry majors only.
4210 Forestry Organization and Administration (3) Problem analysis and decision making in forest resources management. Prereq: Senior standing in Forestry or Wildlife and Fisheries Science or consent of instructor. 2 hrs and 1 lab.

4220 Forest-Resource Management (4) The forest as an integration of resource uses; a review of instrumentation, data interpretation and techniques; the multiple-use concept; valuation of forest resources for decision making and planning; taxation of the forestry firm. Prereq: 4210.

4230 Forest-Resource Management Plans (4) Field problems and principles 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; preparation of a complete plan based on optimizing forest uses. Prereq: 4210. 1 lab.

4240 Interpreting Forest Resources (3) Principles and techniques of interpreting forest resources, importance of environmental interpretation to management of forest resources, development and administration of interpretive services, forest field trips required. Prereq: Introduction to Forest Recreation or equivalent.

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

4340 Aerial Photography in Forest-Resource Management (3) Use of conventional aerial photography in forest-resource management; interpretation of details, aerial inventories, preparation of cover-type maps; uses of other remote-sensing materials in the field. Prereq: Civil Engineering 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; importance of seed source; variation, selection of superior phenotypes and development of seed orchards; hybridization; seed production and seed certification. Prereq: 4006 and 4210.

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's economy, soil erosion, 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 socioeconomic and political ramifications of forest recreation development and management. Prereq: 6 credits in sociology and/or economics. 2 hrs and 1 lab.

5000 Thesis

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

5210 Seminar in Wildlife Conservation (3) Current studies, problems, and issues in wildlife conservation; wildlife agencies and organizations. Prereq: 9350 or consent of instructor.

5310 Seminar (1) Current developments in wildlife and fisheries science. May be repeated. Maximum 6 hrs.

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

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

5260 Industrial Forestry (3) Structure and analysis of wood-using firms and industries. Forest taxation, land tenure and wood procurement alternatives. Development and application of forestry planning models. Prereq: 4230 or consent of instructor.

5270 Topics in Forest Industries Management (3) Current problems in industrial forestry are discussed and analyzed. Executives from the public and private business sector (concerned with forest industry) are invited to conduct lectures on their topics. Prereq: 4250 or consent of instructor.

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

Wildlife and Fisheries Science

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

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

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

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

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

5000 Thesis

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

5210 Seminar in Wildlife Conservation (3) Current studies, problems and issues in wildlife conservation; wildlife agencies and organizations. Prereq: 9350 or consent of instructor.

5310 Seminar (1) Current developments in wildlife and fisheries science. May be repeated. Maximum 6 hrs.

5400 Predator Ecology (3) The dynamics of terrestrial vertebrate predator populations in managed and conserved environments. Principles of predator biology and management. Prereq: 4450 and 4460 or equivalent and 4540.

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.

5600 Game Management (3) Merits and demerits of various game management programs. Prereq: 4540 and 4560 or consent of instructor.

5700 Wildlife Management (3) Wildlife management principles and techniques. Principles of range management. Prereq: 4540 and 4560 or equivalent and 4450.

5800 Wildlife Management (3) Wildlife management principles and techniques. Principles of range management. Prereq: 4540 and 4560 or equivalent and 4450.
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 techniques. Prereq: Greenhouse Management. 3 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 growing plants in a very restricted environment under controlled greenhouse conditions. Prereq: Greenhouse Management, Crop Physiology, or equivalent. 2 hrs and 1 lab.

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

5000 Thesis

5011-21 Special Problems in Lieu of Thesis (3-5, 6-8)

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 developing and managing golf course selection and utilization of grass species and other plant materials and development of maintenance techniques. Prereq: 1950. 3 hrs and 1 lab.


5410 Histological Microtechnique (4) Preparation of plant tissue for microscopic examination, paraffin and plastic embedding, microscopic mounting of sections, dyes and staining schedules and photography. Prereq: General biology or botany; general and organic chemistry, and mechanical maintenance. Financ- ing, equipment, labor management, and planning. Prereq: 5200 and consent of instructor. 2 hrs and 2 labs.

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

Plant and Soil Science

MAJOR

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

Professors: L. F. Stett 1 (Head), Ph.D. North Carolina State; F. F. Bell, Ph.D., Iowa State; H. A. Fribourg, Ph.D., Iowa State; M. L. Josephson, Ph.D., Wisconsin; W. L. Parks, Ph.D. Purdue; H. A. Reich, Ph.D., Iowa State; G. M. Lessman, Ph.D. Michigan State; F. A. Springer, Ph.D., California (Berkeley); H. D. Swingle, Ph.D. Louisiana State.


Assistant Professor: F. L. Allen, Ph.D. Minnesota.

1 Clyde B. Austin Distinguished Professor.

3620 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. Prereq: 8 hrs biological sciences, 2 hrs and 1 lab.

3640 Crop Physiology (3) Physiology of crop plants, proper balance between plant and environment of crop production; use of general theories of physiology; effects of season, growth regulating substances, functions of light, heat, air, minerals, and water. Prereq: 8 hrs biological sciences. 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, morphology, culture, harvesting, and utilization of corn, small grains, grain sorghum, soybeans and related crops. Prereq: Soils, 8 hrs biological science. 2 hrs and 1 lab.

3140 Forage Crops (4) Characteristics, adaptation, improvement, management, and utilization of legumes and legumes for pastures, hay, and silage. Prereq: Soils; 8 hrs biological science. 3 hrs and 1 lab.

3150 Cotton and Tobacco (4) Characteristics, adaptation, improvement, culture, harvesting, and marketing of cotton and tobacco. Prereq: Soils, 8 hrs biological science. 3 hrs and 1 lab.

3180 Fruit Crops Management (4) Soils, planting, cultivation, development of fruit crops, plant pest control, harvesting, packing, storage, and pruning. Prereq: Agricultural Biology 3150 and 3210. 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. Prereq: Soils and Forestry 3320, 3 hrs and 1 lab.

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

3510 Commercial Production of Cool Season Vegetables (3) Characteristics, economic importance, adaptation, and production for fresh and processing markets; emphasis on greens, salad, cole, root, bulb crops, perennials and Irish potatoes. Prereq: 8 hrs biological science. 2 hrs and 1 lab.

3520 Commercial Production of Warm Season Vegetables (3) Characteristics, economic importance, adaptation, and production for fresh and processing markets; emphasis on sweet potatoes, beans, tomatoes, pepper, cucumbers, sweet corn and okra. Need not have 3510 as prerequisite. Prereq: 8 hrs biological science. 2 hrs and 1 lab.

3810 Interpretation of Agricultural Research (3) Statistics as applied to agriculture. Statistical methods in interpretation of research results. Prereq: Introductory Calculus-General Mathematics.

3710 Principles of Weed Science (4) Basic principles of weed science; history, ecology, economic importance; methods of control, types of herbicides, and specific recommendations for various crops in various regions. Prereq: 8 hrs biological sciences. 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 and Introductory Physics. 3 hrs and 1 lab.

4120 Principles of Crop Breeding (4) Genetic principles and techniques. Prereq: 8 hrs biological science or permission of instructor. 3 hrs and 1 lab.

4320 Soil Analysis (3) Analytical techniques used in soil chemistry and soil fertility studies. Prereq: 4110 or concurrent. 2-5 hrs.

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

4320 Soil Formation, Morphology, and Classification (4) Soil formation; properties, distribution, and classification of soils; interpretation of morphology; use of soil surveys. Prereq: Soils. 3 hrs and 1 lab.

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 as related to the physical, chemical, and mineralogical properties of soils; soil in an ecosystem; classification of soils. Prereq: 4220 or consent of instructor. 3 hrs and 1 lab.

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

5340 Soil Physics (3) Chemical and physical relationships among the solid, liquid, and gaseous phases of the soil mass; their relation to plant growth and soil management. Prereq: 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 determining their physicochemical reactions, ion exchange, Donnan equilibrium, colloidal layer theory. Prereq: 4110; Chemistry 4110 or concurrent registration.

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

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

5720 Quantitative Genetics (3) The genetic constitution of populations; change in gene frequency; recognition and measurement of
5750 Advanced Plant Breeding (4) Historical development of plant breeding concepts and methods, effects of heterosis, inbreeding, hybridization and selection. Improvement of self- and cross-pollinated crops. Prereq: 5710, 3 hrs and 1 lab.

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

5820 Advanced Crop Physiology and Ecology (4) Historical development of research in crop physiology and ecology. Interrelationships between physiologic processes and environmental factors. Crop adaptation to specific environmental conditions. Prereq: 3020, 3040; or Botany 3210, 4310 or consent of instructor. 3 hrs and 1 lab.

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

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.

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

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

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

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

Professors:

Associate Professors:

Assistant Professors:

Lecturers:
A. G. Anderson, M.A. Missouri; M. C. Martin.

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

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

4731-32 Earthquake Resistant Structures I, II (4, 4) Analysis and design of structures to resist earthquake effects. Earthquake phenomena. Vibration of a single degree structural systems. Resonance and dampening. Introduction to dynamic analysis of structures, instrumentation and structural response. Frame and shear wall behavior. Ground-structure interaction. Prereq: Consent of instructor. (Same as Civil Engineering 4731-32.)

4733 Structural Design for Protection Against Extreme Hazards (4) Probability, risk, human values, insurance. Survey of possible hazards; floods, fire, hurricanes and tornadoes, earthquakes, nuclear effects, internal and external explosions. Building code and engineered design of steel, masonry, concrete and wood structures to resist extreme effects. Protective construction for human and system needs. Fire protection engineering, fire phenomena, life safety and analysis, high-rise building fires.

4739 Aesthetics of Engineering Structures (4) Architecture in engineering; theory and utilization of space, design, and materials in large structures. Bridges, exhibition halls, power plants.

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

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

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

4920 Advanced Architectural Photography (4) Application of special photographic techniques with emphasis on color printing and processing. Prereq: Consent of instructor.
Graduate Programs

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 with majors in Economics and Statistics, and the Master of Business Administration. The Department of Industrial and Personnel Management participates with the Department of Psychology in the College of Liberal Arts in offering an intercollegiate program in Industrial and Organizational Psychology leading to the Master of Science and Doctor of Philosophy degrees. (See page 100.) Also, the Department of Management Science offers an intercollegiate program leading to the Master of Science degree. (See page 101.)

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.

The complete MBA program with a concentration in industrial management is offered by the regular graduate faculty of the College as a part-time evening program on the Knoxville campus, at Oak Ridge and at the Kingsport University Center.

Students may begin the program in any of the four quarters of the academic year; however, those entering the program in the winter or spring may find it difficult to complete the program in minimum time due to course scheduling and sequencing. The MBA student may select an area of concentration from the following fields:

Accounting Management science
Economics Marketing
Finance Real estate
Forestry and urban development
Management Statistics
Governmental Transportation and
Finance administration logistics
Management

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 at least 42 hours of which must be at or above the 5000 level. Further, at least half of the credit hours taken in Group C (concentration area) must be at or above the 5000 level.

There is no thesis requirement although ample opportunity is provided for research and writing in course work.
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 in some concentration areas. These courses are available only to satisfy Group A requirements and as stated on page 69.

Quarter Hours

Accounting 5050-50 Financial Accounting ........................ 6
Business Law 5050 Legal Environment of Business .................. 3
Economics 5050-60 Economic Analysis, Problems and Policies .... 6
Finance 5050 Survey of Finance Functions of Business .......... 3
Industrial Management 5050 Production Management .......... 3
Marketing 5050 of 12, or (for 5410 only) 18 quarter hours Marketing Management ........................... 3
Office Administration 5050 Data Processing in Business .......... 3

Group B—Core for all Candidates.

Accounting 5810 Accounting for Control 1 .......................... 3
Economics 5070-80 The Firm and Its Environment ............... 6
Finance 5110 Theory of Financial Management ....................... 3
Industrial Management 5230 Human Problems in Administration 3
Marketing 5200 Marketing Management ................................ 3
Statistics 5311 Probability Theory 2 ................................. 3
Quantitative Option (select one): Management Science 5100 Introduction to Management Science 6 or Statistics 5312 Statistical Methods 3
Business Administration 5310 Business Policy ......................... 3
Total, Group B 27

Group C—Concentration. At least 12 but not in excess of 18 quarter hours of graduate level courses are required in one area of concentration. At least half of the credits used to satisfy this requirement must be earned in courses at or above the 5000 level. Any exception must be approved by the student’s faculty committee. To the extent that the concentration area is decreased below 18 hours, Group C—Electives is increased. A student may elect two areas of concentration of 12 to 18 quarter hours each, in which case no courses are required in Group D—Electives. (All double concentration programs should be coordinated through the Graduate Program 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); Intermediate Cost Accounting (6); Intermediate Theory (9); and Federal Income Tax (3).

The following areas must be included in the concentration unless taken in under-graduate 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 Master’s 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 Policy and Financial Institutions: 5800, 5810, 5820, 5830; Forest Industries Management. Area prereq.: B.S. degree in forestry, or equivalent.

Organization, planning and control: Industrial Management 5110, 5120, 5150

Industrial Forestry: Forestry 5200

Topics in Forest Industries Management: 5270

Group D—Electives. Unless the student elects two areas of concentration, a minimum of 6 quarter hours must be taken in areas outside the area of concentration. The elective area is increased beyond 6 hours to the extent that the concentration area is less than 18 hours. With specific approval of the student’s advisor, an elective course may be taken outside the College of Business Administration.

Total, Group D 6-12

Total Program (except Group A) 51

Other Requirements. The application for Admission to Candidacy (see page 19) must be approved by the student’s advisor, an area prereq., 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.

Dual J.D.-MBA Program

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

Admissions. Applicants for the J.D.-MBA program must make separate application to, and be competitively and independently accepted by, the College of Law for the J.D. degree and the Graduate School and College of Business Administration for the MBA degree, and by the Dual Degree Committee.

Students who have been accepted by both colleges may apply anytime prior to, or after, matriculation in either college and may commence studies in the dual program at the beginning of any quarter subsequent to matriculation in both colleges, provided, however, that dual program studies be started prior to entry into the last 42 hours required for the J.D. degree and the last 24 hours required for the MBA degree.

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

The College of Law will award credit toward the J.D. degree for acceptable performance in a maximum of 12 quarter hours of approved graduate level courses offered by the College of Business Administration. Three of the 12 quarter hours must be earned in Accounting 5810 or a more advanced accounting course. If College of Law credit is given for such an accounting course, the student may not receive College of Law credit for Legal Accounting (Law College Course 8590).

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

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

Awards of Grades. For grade recording purposes in the College of Law for graduate business courses and in the College of Business Administration for law school courses, grades awarded will be converted to either Satisfactory or No Credit and will not be included in the computation of the student's grade average or class standing in the college where such grades are so converted. The College of Law will award a grade of Satisfactory for a graduate business course in which the student has earned a B grade or higher and a No Credit for any lower grade. The College of Business Administration will award a grade of Satisfactory for a Law School course in which the student has earned a 2.3 grade or higher and a No Credit for any lower grade. Grades earned in courses of either college may be used on a regular graded basis for any appropriate purpose in the college offering the course. The student must pass a final written comprehensive examination to receive the MBA degree.

The MBA 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 MBA program is structured around four major features. First, it recognizes the interdisciplinary thrust of graduate education and provides the student with a sound foundation for expanding the body of knowledge related to business systems and their interactions with other socioeconomic systems and environmental forces. Second, the student's program is flexible enough to respond to individual needs and interests yet is formulated within a sound framework to achieve overall objectives. Third, emphasis is placed upon conceptual foundations and analysis of decision-making processes rather than the descriptive aspects of business administration. Fourth, the student does advanced work in the basic disciplines of economic theory, behavioral science and quantitative science to provide the necessary foundations for research.

Foundation Requirements. Although the program is designed for students who have completed an accredited MBA (or equivalent) degree program, those with outstanding undergraduate records in any area may be admitted directly to the MBA program and may, if they desire, earn the MBA degree in a coordinated program of study. Program prerequisites include at least one year of college mathematics to include college algebra, general mathematics and a course in single variable calculus; a course in statistics; knowledge of computer programming (FORTRAN IV); intermediate economic theory (micro and macro); and introductory courses in financial accounting, business finance, marketing, operations (production) management, and the legal environment of business. Entering students deficient in any of these areas may enroll in courses designed to meet these requirements.

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

A. Business Functional Areas. One graduate level course in each of the following areas must be completed:

1. Statistics
2. Microeconomics
3. Managerial Accounting
4. Financial Management
5. Marketing Management
6. Organization Theory
7. Behavioral Science
8. Quantitative Science
9. Business Policy

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

1. Economics
2. Advanced Microeconomic Theory
3. Advanced Macroeconomic Theory
4. Organizational Behavior (Industrial Management 5610-20)
5. Computer Science
6. Accounting
7. Finance
8. Management
9. Marketing
10. Transportation and logistics

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

1 Students who choose this field as a supporting area take Industrial Management 5170 and 5180.
2 Statistics 5311 and 5313 and Management Science 5100 may not be included.
Preliminary Examinations. Comprehensive written preliminary examinations consisting of two sessions of approximately four hours each in the concentration area and one four-hour session in the supporting area are required of each person working toward the DBA degree. The student's committee may, if they deem it advisable, supplement the written examinations with oral examinations, and may accept the results of an oral examination only for supporting areas outside the College of Business Administration. These examinations are scheduled twice a year, in early October and early May. The student may opt to sit for all sessions during a single examining period, or may sit for the concentration sessions and the supporting session in two successive periods. A student who fails an area on the first attempt must, if he/she wishes to continue in the program, retake the examination at the next scheduled administration, the results of which shall be final.

Admission to Candidacy. A student may apply for admission to candidacy for the DBA degree after maintenance of at least a B average in course work, successful completion of preliminary examinations and acceptance of a research proposal for the dissertation topic by his/her faculty committee. Admission to candidacy must be approved at least three quarters prior to the date the degree is conferred. Admission in the fall quarter permits graduation in the following spring quarter.) Prior to presenting the research proposal for formal approval, the student must form his/her faculty committee and request the concentration area department head to recommend their appointment by the Vice Chancellor for Graduate Studies and Research. There must be at least four members, one of whom must be from a department (or discipline) outside the concentration area.

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.

Other Requirements. For information concerning program admission requirements, academic performance standards, fellowships and assistantships, and general rules and regulations of the Graduate School, see other parts of the College of Business Administration section and the first section of this catalog, "The Graduate School."

Minimum Academic Performance Standards

A graduate student in the College of Business Administration whose grade point average at the point at which he or she applies for admission to candidacy for the DBA degree is below 3.0 shall be placed on probation. A student on probation shall be dropped from the program unless his or her cumulative graduate grade point average is 3.0 or higher at the end of the probationary period. The probationary period is defined as the next 12 quarter hours of course work attempted which is specified in the student's degree program. Exceptions to this policy may be made only with the approval of the Assistant Dean for Graduate Programs of The College of Business Administration upon recommendation of the student's faculty committee.

Admission Requirements

General admission requirements for the Graduate School are stated on pages 11-12. MBA and DBA applicants are required to take the Graduate Management Admission Test (GMAT). Applicants for programs in economics, management science, and statistics may submit results of the Advanced GRE score for economics. Applicants for management science must score a minimum of 500 on the GMAT and meet the qualitative 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 (pages 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 the leading graduate schools of business as a member of the Graduate Management Admission Council.

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 by his/her faculty 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 Graduate Record Examination (GRE). Application forms may be obtained in any of the departments or from the office of the Assistant Dean for Graduate Programs. Applications must be received by March 15 for consideration of assistantships to be awarded for the following fall term.

Center for Business and Economic Research

The staff of the Center for Business and Economic Research engages in studies of the business and economic environment in Tennessee, the Southeast, and the Nation. The Center serves the business community, state government, Individuals, and the University through dissemination of various kinds of economic and socioeconomic information and supports the faculty of the College in seeking funding for research projects. Staff members conduct research in regional economics, public finance, and areas related to socioeconomic problems in the region. The Center publishes the results of its own research and that of others in monograph form so that significant developments in the various business disciplines and economics can achieve widespread exposure. In addition, the Center staff 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 objectives of the program are to prepare and develop executives for increasingly higher levels of management responsibility and to sharpen existing executive skills needed for comprehensive decision making and leadership. Other major aims of the TEDP are to 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 thirty-two 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 specialists who are leaders in management-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 out-
standing practitioners in their fields of business and industry.

Departments of Instruction

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

Accounting and Business Law

Accounting

Professors:
N. E. Dittrich, Ph.D. Ohio State, C.P.A.;
J. R. Williams, Ph.D. Arkansas, C.P.A.

Associate Professors:
H. C. Harring, III, Ph.D. Alabama, C.P.A.;
P. A. Jacobs, Ph.D. Louisiana State, C.P.A.;
J. E. Kiger, Ph.D. Missouri, C.P.A.;
V. R. Morse (visiting), Ph.D. Michigan State, C.P.A.;
G. C. Nichols, Ph.D. Louisiana State, C.P.A.;
I. A. Posey, M.S. Tennessee, C.P.A., C.M.A.;
N. E. Shurtz, L.L.M. Georgetown; K. G. Stanga,
Ph.D. Louisiana State, C.P.A.;
R. T. Townsend, Ph.D. Texas, C.P.A.;
F. W. Watkins, Ph.D. Louisiana State, C.P.A.,
I. A. Posey, M.S. Tennessee, C.P.A., C.M.A.;
M. C. Letsinger, M.S. Tennessee, C.P.A.

Assistant Professor:
J. R. Kiger (Head), Ph.D. Missouri, C.P.A.

4120 Advanced Auditing (3) Case-oriented course including audit of specific asset, liability, revenue and expense accounts, with emphasis on reporting, data processing, statistical sampling, and internal auditing. Prereq: Principles of Auditing C or better.


4990 Accounting Theory (3) Theory and conceptual framework underlying measurement of income and financial position as related to the resolution of key reporting problems. Prereq: Intermediate Accounting C or better.

5000 Thesis

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

5050-60 Introduction to Accounting (3, 3) User-oriented survey of financial and managerial accounting principles and practices. May not be taken by accounting majors.

5110 Seminar in Accounting Theory (3) Evolution of accounting theory, concepts underlying financial reporting models, and authoritative accounting literature as each relates to measurement of periodic performance and financial position. Prereq: Consent of department head. May not be taken by students with credit for 4900.

5120 Seminar in Advanced Auditing (3) Theory and concepts underlying the philosophy of auditing as related to current auditing issues. Prereq: 4900 or 5110 taken in sequence.

5130-40 Seminar in Current Accounting Topics (3, 3) Critical in-depth consideration of current issues in financial accounting literature. Prereq: 4950 or 5110 or consent of instructor.

5150 Research in Accounting (3) Directed problem-oriented research in financial accounting, managerial accounting and auditing topics. Prereq: 440.

5160 Graduate Internship in Accounting (3) Full-time resident professional employment for one academic quarter involving qualified job experience, a written report of responsibilities, and an evaluation of student performance. Prereq: Consent of instructor.

5210-20 Seminar in Advanced Managerial Cost Accounting (3, 3) Analysis of current issues and formulation of individual research projects. Topics include cost allocation problems, budgeting, human resource measurement, social cost effects, performance evaluation and responsibility accounting concepts, service industry costing and analysis of non-profit ventures and programs. Prereq: Managerial Cost Accounting or equivalent. Must be taken in sequence.

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

5330 Advanced Income Tax (3) Federal income taxation with emphasis on tax planning and research. Not intended for persons who have credit for an advanced tax course. Prereq: Intermediate Accounting. Prereq or coreq: Statistical Sampling and Mathematical Statistics or equivalent.


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

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

5510 Not-for-Profit Accounting (3) Theory and practice of budgetary and fund accounting, financial reporting, measures of output and accomplishment, and financial and performance auditing for non-profit entities. Prereq: 8 hrs of accounting and consent of instructor.

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

5540 Seminar in Accounting Information Systems (3) A survey of literature on accounting information systems and advanced systems analysis and design concepts. The informational needs of other functional areas of business and the implications of these areas are considered. Prereq: 4500 or equivalent.

5510 Accounting for Control (3) User-oriented survey of current financial and managerial accounting literature and practice. Prereq: 5000 or equivalent or consent of instructor. Not available for accounting majors.

5570 Corporate Reporting Problems (3) A user-oriented introduction to current corporate financial reporting problems and issues. May not be taken for credit by students whose undergraduate major was accounting, or whose graduate concentration is accounting. Prereq: 5810 or consent of instructor.

6000 Doctoral Research and Dissertation

6110-20-30 Doctoral Seminar in Accounting (3, 3, 3) Analysis of issues reflected in accounting literature. Prereq: 6110 or credit for a graduate research course.

Business Law

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

Associate Professor:
N. E. Shurtz, L.L.M. Georgetown.

5500 Legal Environment of Business (3) Surveys legal and quasi-legal institutions with emphasis on the administration agencies which have particular significance to the business-man; examines government regulation of business; explains basic legal notions and principles that pertain to businessmen. (Available only as stated on page 36.)

Business Administration

MAJOR DEGREES

Business Administration MBA, DBA

5310 Business Policy (3) Case studies covering political, economic and social environments. Topics include the resolution of key reporting problems. Prereq: Consent of instructor.

5311 Business and Its Societal Environment (3) An analysis of current forces and changes in society and the interrelationship of plans and actions in business firms with environmental factors. Prereq: Consent of instructor.

5610 Seminar in Applied Business Analysis (3) Application of business concepts and analytical skills to the problems of small businesses in the community. Students work in teams under the supervision of a participating professor. Prereq: Consent of instructor. May be repeated. Maximum 8 hrs.

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

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

Business Education

See College of Education

Economics

MAJOR DEGREES

Economics M.A., MACT, M.S., Ph.D.

Professors:
J. R. Moore (Head), Ph.D. Cornell; R. E.
Bowers, Ph.D. Indiana; F. H. Texas; G. R.
Feiwel, Ph.D. McGill; J. A. Florida; H. S.
Clark, H. E. Jensen, Ph.D. Texas; F. Y. Lee,
Ph.D. Michigan State; W. C. Neale,
Ph.D. Louisiana School of Economics; G. A.
Spiva, Ph.D. Texas; R. H. Wolf, Ph.D. Vanderbilt.

Associate Professors:
S. Carroll, Ph.D. Harvard; H. S. Chang, Ph.D.
Vanderbilt; C. B. Garrison, Ph.D. Kentucky;
E. Glustoft, Ph.D. Stanford; R. H. Grand;
D. Florida; A. Mayhew, Ph.D. Texas;
K E. Phillips, Ph.D. Washington (Seattle).
Assistant Professors: N. O. Alper, M.A. Pittsburgh; R. J. Gaslon, Ph.D. East (Los Angeles); R. D. Gusteley, L. L. Malors (visiting), B.A. Tennessee; F. M. Murtaugh (visiting), M.A. Tennessee; Ph.D. Syracas; H. W. Hering, Ph.D. Maryland; A. M. Schiottmann, Ph.D. Washington (St. Louis).

THE MASTER'S PROGRAM

The minimum requirements for a graduate major in Economics for the Master of Arts and the Master of Science degrees consist of the following: (1) Economics 5111-5112 and Economics 5121-5122, (2) 9 additional hours in economics at the 4000 or above level, (3) a thesis, or an additional 9 hours in economics at the 5000 level or above to be concentrated in one field. Students electing the non-thesis option will be required to pass a final written comprehensive examination.

The requirements for a graduate minor in Economics are as follows: Either (1) 5111-12 and 5121, 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 9 hours to meet unusual conditions.

MASTER OF ARTS IN COLLEGE TEACHING DEGREE

The requirements for the MACD degree are listed on page 19. A thesis is required.

THE DOCTORAL PROGRAM

Subject Area Requirements.

1. Students will be required to demonstrate their competence in the core subject fields as indicated:
   a. Economic theory, by a preliminary examination.
   b. Economic history, by completing 6 hours in economic history at the 5000 level or above with an average grade of B or better or by satisfying an examining committee.
   c. History of economic thought, by completing Economics 5150 and 3 additional hours in this area at the 6000 level with an average grade of B or better or by satisfying an examining committee.
   d. Mathematical and quantitative methods in economics, by completing Economics 5180, 5190, and 5510 with the average grade of B or better or by satisfying an examining committee. (Note: The Economics 5510 requirement may be waived for those students completing Economics 6170, 6180, and 6190.)

2. Students will be required to demonstrate their competence by preliminary examination in three fields with the approval of the department. At least two of these courses must be taken from the following:
   - Economic development
   - Economics of labor and manpower
   - Industrial organization

International economics

Regional economics

A field, as agreed to by the Department, combining two or three of the above.

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

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

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

5000 Thesis

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

5011-12 Problems in Lieu of Thesis (3, 3) The requirements for the MACT degree 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. Theoretical and empirical explanations of cycles, and the policies that have been proposed to combat them. Prereq: Intermediate Macro Theory or consent of 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 socio-economic conditions which influenced this development. Period covered: 1776 through 1936. Prereq: 1 yr of Principles of Economics and consent of instructor.

4170-40 Introduction to Mathematical Economics (3, 3) Application of mathematical methods in the theoretical study of micro- and macroeconomic phenomena. Designed for beginning graduate students who have limited training in analytic geometry and calculus. Must be taken in sequence. Prereq: Intermediate Micro Theory and college algebra, calculus, and analytic geometry or the equivalent.

5050 Introduction to Economic Analysis (3) The nature of economic theory as a science; brief survey of the evolution of economics; analytical tools of macro- and microeconomics. (Available only as stated on page 36.)

5060 Introduction to Economic Problems and Policies (3) Economic theory as a basis for problem solving; tools of public and private policies for economic stability, growth and minimum income, international economic relations and the problems of economic growth.

5710 Public Finance: Revenues (3) (Same as Finance 6710.)

5720 Public Finance: Expenditures (3) (Same as Finance 5720.)

5740 Seminar in Public Finance (3) (Same as Finance 5740.)

5810 Financial Markets and Intermediaries (3) (Same as Finance 5810.)

5820 Monetary Theory and Policy (3) (Same as Finance 5820.)

5830 Commercial Bank Management (3) (Same as Finance 5830.)

6111 Seminar in Advanced Microeconomic Theory (3) Topics in microeconomic theory. May be repeated for credit with permission of the department. Prereq: 5111, 5112 and consent of instructor.
621 Seminar in Advanced Macroeconomic Theory (3) (3, 3, 3) Topics in macroeconomic theory. May be repeated for credit with permission of the department. Prereq: 5121, 5122 and consent of instructor.

6150-60 History of Economic Doctrines (3, 3) Impacts of economic thinkers from the Middle Ages to the present.

6170-80-90 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, extensions of the least squares regression model, and approaches to simultaneous equation models with application to current econometric research. Prereq: 5180-90 and 5510 or the equivalent.

6710-20 Seminar: Fiscal Theory and Public Finance (3, 3) (Same as Finance 6710-20).

INTERNATIONAL TRADING AND ECONOMIC DEVELOPMENT

4230 Problems in International Trade and Economic Development (3) Problems or problem areas of current importance in the fields both of international economics and economic development.

4240 Economic Development of the United States (3) Historical developments in agriculture, industry, communications, transportation, banking, and trade and of changes in government 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.

4280 Economics of Resources (3) Description, needs and allocation of resources. Benefits and costs of development and use of resources in industrial society.

5210 Seminar in International Trade Theory (3) Studies in pure theory of international trade.

5220 Seminar in Economic Development (3) Study of the economic problems of developing countries.

5250 Economic History of Europe (3) Studies of the nature and functioning of economic systems and policies in the history of western civilization; emphasis on some major issues of method and interpretation.

5260 Economic History of the U.S. (3) Studies of major issues in the interpretation of American economic structure and policies from colonial times.

5610 Location and Regional Development Theory (3) Theory of industrial, agricultural, and residential location; the economic basis for land use patterns and central places; examination of regional inequalities and national assistance for regional economic development.

5620 Methods of Regional Analysis (3) Theory of regional structure and growth. Examination of regional models for impact analysis and economic forecasting. Methods of analysis include regional descriptive statistics, gravity and potential concepts, regional income and product accounts, shift and share analysis, economic base studies, and regional input-output, linear programming, and econometric models.

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

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 societies other than those of Western Europe and English-speaking North America. May be repeated for credit with permission of the department. Prereq: Consent of instructor.

6510 Seminar in Regional Analysis (3) Selected topics in regional economic theory and analysis. May be repeated. Maximum 6 hrs.

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

6550 Seminar in Environmental and Resource Economics (3) Topics in environmental quality, natural resource allocation by private markets, and issues in formulating public policy towards environmental problems. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

6560 Seminar in Environmental and Resource Economics (3) Topics in environmental quality, natural resource allocation by private markets, and issues in formulating public policy towards environmental problems. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

6580 Seminar in Resource Allocation and Economic Growth (3) Selected topics in applied regional research. Emphasis is on the identification of regional issues in a model of design and estimation, forecasting, simulation and mathematical and computer programming. May be repeated. Maximum 6 hrs.

6650 Seminar in Environmental and Resource Economics (3) Topics in environmental quality, natural resource allocation by private markets, and issues in formulating public policy towards environmental problems. Prereq: Consent of instructor. May be repeated. Maximum 9 hrs.

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.

5351 Seminar in Industrial Organization Analysis (3) Monopoly and competition in the United States economy; market structure, business behavior, and economic performance and their interrelationships. Prereq: 9 hrs of introductory economics.

5361-62, 6361-62 Seminar in Industrial Organization (3, 3, 3, 3) 6351-62—Survey of the organization of industry in the American economy, with emphasis on the empirical and analytical techniques used in investigating structure, conduct and performance. 6361-62—Public Policy in the United States with respect to industrial structure and business conduct; examination, appraisal and proposals for change.

ECONOMICS OF CENTRALLY PLANNED ECONOMIES

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

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

ECONOMICS OF LABOR AND MANPOWER


4430-40 Labor Legislation (3, 3) 4430—Economic background and effects of governmental regulation of labor relations, with emphasis on current and past legislation. Prereq: Consent of instructor. 4440—Development and application of the Fair Labor Standards Act, the Safety and Health Act, workmen's compensation acts, and related legislation affecting labor relations.


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

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

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

Finance

Professors:

Associate Professors:
A. B. Bisce, Jr., Ph.D. Florida; R. A. Bohm, Ph.D. Washington; J. C. Golden, Ph.D. Georgia; W. D. Griswold, Ph.D. Wisconsin (Milwaukee); J. H. Lord, DBA Indiana; R. E. Shreve, Ph.D. California (Los Angeles); D. L. Stevens, Ph.D. Michigan State.

Assistant Professors:
A. L. Auxier, Ph.D. Iowa; H. S. Banton, Ph.D. Georgia State; M. Lindahl, Ph.D. Illinois (Champaign-Urbana); J. M. Wachowicz, Jr., M.Acc.Sci., CPA, Illinois (Champaign-Urbana); R. A. Weir, Ph.D. North Carolina.

5000 Thesis

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

6000 Doctoral Research and Dissertation FINANCE AND INVESTMENTS

5050 Survey of Financial Institutions (3) The scope and nature of managerial financial planning; 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 fundamentals of financial accounting. (Available only as stated on page 36.)

5110 Theory of Financial Management (3) Financial decision making with the objective of maximizing shareholder wealth. Decision areas include the investment decision, 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 sta-
5130 Financial Administration (3) Cases and readings within the firm; refined techniques of analysis; optimal financing decisions; capital cost measurement; utilization of capital markets; general corporate financial theory. Prereq: Personnel Management (3).

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

5420-30 Investments (3, 3) The investment decisions of financial managers influence the portfolio policies and security prices; financial statement analysis; and stock-price valuation models. Must be taken in sequence.

5620 Taxation and Business Decisions (3) Impact of tax-expenditure policy on decisions of the firm. Description of tax systems; tax shifting and incidence; implications of specific taxes to price, employment, financial, and other decisions of the firm. The impact of taxes on industrial structure, international operations, and location.

5800 Executive-in-Residence Seminar for MBA (3) This course develops the practical aspects of financial management and investments. Leading business executives and governmental personnel are invited to conduct the class. Prereq: Consent of the department.

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


6420 Theory of Finance (3) The theory of financial decision-making under conditions of uncertainty and the allocation of financial resources over time with reference to financial decisions, investment decisions, and the determinants of the cost of capital.

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

MONE TARY POLICY AND FINANCIAL INSTITUTIONS

5810 Financial Markets and Intermediaries (3) A study of capital formation and the allocation of credit to the U.S. economy and abroad. The analysis covers the process of saving, the partial institutionalization of these savings, the investments of 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.)

5920 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 5050 or equivalent. (Same as Economics 5920.)

5930 Commercial Bank Management (3) Bank management decision-making analysis of changes in banking environment and structure; analysis of capital adequacy of financial institutions; current banking problems. Prereq: Consent of instructor. (Same as Economics 5930.)

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

6810 Financial Institutions and Markets (3) Theory of financial markets, the role of financial institutions, and analysis of market efficiency.

GOVERNMENTAL FINANCIAL ADMINISTRATION

5710 Public Finance: Revenues (3) Allocative, distributive, and stabilization effects of alternative revenue systems. Coreq: Economics 5050 or equivalent. (Same as Economics 5710.)

5720 Public Finance: Expenditures (3) Functions and growth of the public sector, public goods, and benefit/cost analysis. Coreq: Economics 5050 or equivalent. (Same as Economics 5720.)

5730 Finance Administration of Government (3) Budgeting and cash management in public sector. Prereq: Economics 5050 or consent of instructor.

5740 Seminar in Public Finance (3) Selected topics: public choice, pricing government services, fiscal policy, and fiscal dynamics. Prereq: 5710. (Same as Economics 5740.)

6710-20 Seminar: Fiscal Theory and Public Finance (3, 3) Advanced topics in fiscal theory and policy. (Same as Economics 6710-20.)

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 (4) An interdisciplinary course in urban problems. Prereq: Consent of instructor. (Same as Architecture 4900 and Psychology 4900.) S/NC only.


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. Preq: 5110 or consent of instructor.

5140 Real Estate Investment and Taxation Analysis (3) Analysis of economic factors and institutions which underlie real estate investment, real estate finance and appraisal theory. Preq: Finance 5050 or equivalent.

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

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

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

5240 Personnel Research Seminar (3) Review of research in personnel administration; development of experimental design. Prereq: Personnel Management (3).

5250-60-70 Industrial and Organizational Psychology (3, 3, 3) Learning and organizational psychology. Prereq: Consent of instructor. S/NC or letter grade.

5610-20-30 Industrial and Organizational Psychology (1, 3, 1-3) Reading in industrial and organizational psychology. Prereq: Consent of instructor. S/NC or letter grade.

5620 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 and psychological factors affecting people in organizations, including a review of empirical behavioral research in organizations. Must be taken in sequence.

Associate Professors: R. D. Arvey, Ph.D. Minnesota; F. A. Chambill, MBA Indiana; R. L. Dipboye, Ph.D. Purdue; O. S. Fowler, Ph.D. Georgia; D. L. Johnson (visiting), Ph.D. Bowling Green; R. C. Maddox, Ph.D. Texas; W. W. Neil, Ph.D. Alabama.

Assistant Professors: J. B. Bachmann, Ph.D. Virginia Polytechnic Institute; A. M. Francisco (visiting), Ph.D. Ohio State; W. Henderson, Ph.D. Purdue; W. W. Williams, Ph.D. Pennsylvania State.

5801-02-03 Readings in Personnel Management (1, 2, 3) Prereq: Personnel Administration, Statistics 4310, and consent of instructor.

5000 Thesis

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

5050 Production Management (3) Analysis of the production function with emphasis upon application of mathematical-statistical techniques. For MBA students only. Available only as stated on page 36.

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) Principles of management planning and controlling, with emphasis on long-range corporate planning.

5170-90-90 Proseminar 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, programs, and practices.

5230 Human Problems in Administration (3) Review and critique of research in industrial 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) Reading in industrial and organizational psychology. Prereq: Consent of instructor. S/NC or letter grade.

5250 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 and psychological factors affecting people in organizations, including a review of empirical behavioral research in organizations. Must be taken in sequence.

Industrial and Personnel Management


3 William B. Stokely Professor of Management.
4 Alumni Distinguished Service Professor.
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.

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

6000 Doctoral Research and Dissertation

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 (1-18) Supervised practice. One credit for each 30 hours of such practice. Maximum 15 credits. (Same as Psychology 6900.)

Management Science

MAJOR

DEGREE Ph.D.

Management Science

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

Assistant Professor: R. E. Rosenthal, Ph.D. Georgia Institute of Technology.

Management Science Committee: Members of the Management Science faculty and in addition: R. W. Boling, Industrial Management; J. S. Bradley, Mathematics; R. L. Church, Civil Engineering; S. Selkov, Computer Science; C. C. Whigpen, Statistics.

MBA CONCENTRATION

Management Science 5310-30-40 forms the nucleus of a 12 to 18 hour concentration in management science for MBA students. See pages 35-36 for further MBA details.

THE DOCTORAL PROGRAM

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

(1) to provide, through management science course work, a thorough knowledge of common Management Science/Operations Research mathematical models and their uses;

(2) to provide sufficient advanced study in an applied concentration area to qualify the graduate for a joint faculty position in the concentration area as well as in management science. The candidate may choose from the business functional areas (accounting, finance, marketing, production management, and transportation and logistics) or other disciplines, e.g., forestry, ecology, and public administration;

(3) to develop in the student, through course work in mathematics, statistics, and computer science, a high degree of mathematical maturity which will serve the graduate well throughout a life-long career, whether in management, research, or teaching.

Degree Requirements. General University regent policy for the doctoral degree are stated on page 22.

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

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

Qualifying Examinations. The student must demonstrate mastery of probability theory and statistical inference (Statistics 5110-20-30) by passing a written qualifying examination or by presenting other evidence of mastery of the material satisfactory to the faculty. Topics normally include matrix methods (Mathematics/Computer Science 5655-65-75) and real analysis (Mathematics 4510-20-30). Other options may be approved.

There is no foreign language requirement.

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

Preliminary Examination. Prior to admission to candidacy for the degree, and normally after completion of the second year of the program, the student must pass a written preliminary examination covering the theory of deterministic and stochastic management science models. Topics included in this examination are determined on an individual basis. Students will be expected to demonstrate an integrative ability that goes beyond simple mastery of course content.

Research and Dissertation. The student must complete 36 quarter hours of Management Science 6000, Doctoral Research and Dissertation, through which he/she is expected to make a significant contribution to the science. A final oral examination is conducted over the dissertation and such other segments of the program that the faculty committee deems appropriate.

This effort, which is beyond the minimum 72 hours of course work, normally is completed in the third year of the program.

5000 Thesis

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

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


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

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

5610 Markovian Decision Models (3) Formulation and analysis of Markov Chain models; Markov Chain models which incorporate decision-making—its formulation, application and solution through policy iteration. Stochastic dynamic programming models in continuous time. PreReq: 5350.

5620 Queuing Models (3) Application and mathematical analysis of models of congestion. Basic birth-death process models, other Markovian models; non-Markovian models for systems with general service or arrival patterns, priority customers or other complicating assumptions; queues in series. PreReq: 5330 or Mathematics 4750-60.

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

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

6000 Doctoral Research and Dissertation

6110-20-30 Models for Production Systems (3, 3, 3) A seminar providing research practice to enhance the professional development of doctoral students. Includes investigation of existing mathematical models for production processes and opportunities for original research.

6810 Special Topics (3) PreReq: 5310-20-30 and consent of instructor. May be repeated. Maximum 6 hrs.

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

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

Marketing

Professors: D. W. Lyles, DBA Indiana; G. E. Hiiis, DBA Indiana; R. B. Woodruff, DBA Indiana.

Associate Professors: D. J. Barnsby, Ph.D. Purdue; R. J. McMillan, Ph.D., Ohio State; R. C. Reizenstein, Ph.D. Cornell; G. D. Sentei, DBA Indiana.


5002 Non-Thesis Graduation Completion (3-15)

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

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 38.)

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

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

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

5300 Marketing Research (2) Investigation and solution of problems; application of research methods to functional areas of marketing. Research concepts, methods, and techniques. Prereq: Statistics 5311 or equivalent.

5310 Quantitative Techniques in Marketing Analysis (3) Application of quantitative techniques to marketing problems. Models for decision making and strategy formulation. Prereq: 5300.

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

450 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 individual and group 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. Specific topic areas will vary with each course offering. Prereq: 9 hrs of graduate marketing, incl. 5300 and 6110.

Transportation and Logistics


Assistant Professor: J. H. Foggin, DBA Indiana.

5002 Non-Thesis Graduation Completion (3-15)

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

5050 Survey of Transportation and Logistics (3) Analysis of the logistical demands made by society and specific users upon the nation's transportation system and the problems facing the government and business in meeting these demands. (May not be included in a concentration or minor in transportation.)


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

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

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

5220 Physical Distribution Strategy (3) Development and administration of basic logistical policies. Analysis of physical distribution and supply problems with emphasis on executive action. Practical applications through a case approach and simulation game. Prereq: 5210, Statistics 5311.

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

5810 International Transportation Policy (3) Comparative analysis of transport systems in other countries. Analysis of U.S. policy relative to international transportation.

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

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

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

6000 Doctoral Research and Dissertation

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

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

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

Office Administration

Professors: G. A. Wagoner (Head), M.S. Indiana; D. Reese, Ph.D. Iowa.


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

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

4410-20 Advanced Shorthand and Transcribing (3, 3) Improvement of ability to take dictation and transcribe mailable copy; emphasis on skill necessary to meet occupational standards. 3-2 hr periods.

4430 Supervised Office Experience (3) Orientation to office position through actual office work; training in office procedures for handling correspondence and mail; filing systems; oral communications; office planning and layout; systems of control.

4530 Office Systems (3) Routines and procedures for handling correspondence and mailing; filing systems; oral communications; office planning and layout; systems of control.

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

MAJOR

Statistics

DEGREES

M.S.

Professors:

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

Associate Professors:

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

Assistant Professors:

G. B. Ranney, Ph.D., North Carolina State; S. W. Ward, Ph.D., Virginia Polytechnic Institute.

THE MASTER'S PROGRAM

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

Statistics Major Area

Quarter Hours

Probability theory ............ 3
Theory of statistical inference .......... 6
Additional coursework in statistics as approved by the student's committee .......... 9
Total minimum hours .......... 45

*Twelve hours of approved course work, to include Statistics 5610, may be substituted for the thesis requirement.


Statistics for Engineering (3) Survey of statistical methods with special application for engineering students: frequency distributions, selected sampling distributions, some tests of significance; introduction to linear regression. Prereq: Third quarter of calculus and analytic geometry.

Statistics for meaningful careers as consulting and practicing statisticians. A foundation in theoretical and applied statistics is designed to provide students a basic understanding of statistical methods with special application for engineering students: frequency distributions, selected sampling distributions, some tests of significance; introduction to linear regression. Prereq: Third quarter of calculus and analytic geometry.

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

Theory of Probability (3) Probability axioms, discrete and continuous random variables, functions of random variables, expectation, and sampling distributions. Prereq: Analytic Geometry and Calculus of a Single Variable or Calculus Refresher and one course in computer programming. May not be taken for credit by students who receive credit for 5110.

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 one course in computer programming. May not be taken for credit by students who receive credit for 5110.

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

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

4540 Intermediate Regression Analysis (3) Linear and multiple regression, weighted least squares, polynomial models, use of dummy variables, selection techniques in multiple regression, non-linear least squares estimation. Prereq: Second year of calculus and introduction to linear regression.

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

5600 Applied Multivariate Analysis (3) Canonical correlation; discriminant analysis for several groups; and for equal and unequal covariance matrices; principal component analysis; Hotelling's T²; multivariate analysis of variance and covariance. Prereq: One year's coursework in applied statistics, including analysis of variance and multiple regression analysis.

5670 Factor Analysis (3) Principal component analysis and principal factor analysis; estimates of communalities; methods of rotation; interpretation of factors; cluster analysis. Prereq: 5600.

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 Undergraduate Studies, the American Association of Schools and Departments of Journalism and Broadcast Education Association.

A graduate student in the College of Communications whose grade point average, not including incomplete grades, is below 3.0 at any time after the end of 12 hours of graduate credit shall be placed on probation. A student on probation shall be dropped from the program unless his or her cumulative grade point average is 3.0 or higher at the end of the probationary period. The probationary period is defined as the next 12 quarter hours of graduate course work attempted which is specified in the student's degree program.

Exceptions to this policy may be made only with the approval of the Assistant Dean for Graduate Studies of the College of Communications upon recommendation of the student's faculty committee.

MASTER OF SCIENCE

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

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

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

In addition, the following minimal requirements normally are specified for admission to potential candidate status in the Major 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. Applicants must also complete the California Psychological Inventory.

Students are admitted to the program only for summer and fall quarters each year. Applications for the graduate program, including all necessary materials, that are not received at least six weeks before registration may not be processed in time for admission to full potential candidate status in the first quarter. In these cases, the student may still qualify for non-degree or post-baccalaureate status.

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

- 24 hours of approved courses in the major, including Communications 5100, 5120, 5140, and 6100, at least 9 hours in one concentration area (advertising, broadcasting, journalism), and at least 15 hours at the 5000 level;
- 9 hours of thesis work;
- at least 12 hours in a minor area approved by the major advisor, at least 6 of which must be at the 5000 level.

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

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

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

- 33 hours of approved courses in communications, including Communications 5100, 5120, and 5140, at least 12 hours in one concentration area (advertising, broadcasting, journalism), and at least 15 hours at the 5000 level;
- at least 12 hours in a minor area approved by the major advisor, at least 6 of which must be at the 5000 level;

* 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, journalism must minor outside the College of Communications.
- 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 in the related social and behavioral sciences. The program is flexible and will accommodate a wide variety of career goals in communications.

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

The following are normally minimal requirements for admission to full potential candidate status: (a) a 3.0 (4.0 system) grade point average in undergraduate studies, or 3.5 for graduate work if applicant holds a Master’s degree; (b) completion of the California Psychological Inventory; (c) endorsement by at least three former teachers or professional colleagues chosen by the Graduate Studies Committee; (d) statement of the applicant's goals and reasons for pursuing the graduate degree. 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 course work; (c) primary concentration in communications: 15-18 hours of course work; (d) secondary concentration in a cognate minor subject normally outside communications: 12 hours of course work; (e) technical competence area in either teaching, research, or administration: 15-18 hours of course work and, for those who lack appropriate professional experience, an internship equivalent of 9 credit hours; (f) research tool: 12 hours of course work, e.g., statistics, foreign language, or computer science; (g) dissertation: 36 hours of Communications 6000.

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

- Communications 5100, Introduction to Graduate Studies
- Communications 5140, Communications Theory
- Communications 5210, 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 5090.

Continuing and Higher Education 5450, Instruction In Higher Education.

Industrial and Personnel Management 5110-20, Organization Theory I and II (or equivalent courses approved by committee).

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

**Communications Research Center**

The Communications Research Center is a vital adjunct to the communications graduate program. Objectives of the Center are: (a) to conduct original research in 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**

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<th>DEGREES</th>
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<tr>
<td>Ph.D.</td>
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Professors:

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

**Associate Professors:**


**5000 Thesis**

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

**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. Scientific process, bases for derivation and verification of hypotheses, and basic methods of designing research in communications.

**5130 Advanced Principles of Mass Communications (3)** A proseminar 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 in communications processes in intrapersonal, interpersonal, and mass communications systems. (Same as Speech 5140.)

**5150 Seminar in Communications Issues (3)** Examination of contemporary topics in communications. Maximum 6 hrs. Prereq: 5100 and 5140, or consent of instructor.

**5970 Independent Study (3)** Reading, research, or projects on special topics in communications. 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 in supporting research data dealing with source, media and receiver, or situational variables in the process of communication. Prereq: 5100. Recommended: 5140.

**6200 Seminar in Communication Topics (3)** Intensive analysis of special issues and problems in human communication. Repeatable; each section 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 (mail, telephone), data processing and interpretation. Attitude measurement and message processing applications. Prereq: 5120 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 multifactor experimental designs. Laboratory and field experiment situations. Prereq: 5100 or 5140, or consent of instructor. Basic statistics course prerequisite or coreq.

**6320 Seminar in Historical Research Methods in Communications (3)** Materials and methods in historical, descriptive, and legal research in communications theory. Prereq: 5100, 5120, Speech 5450. Recommended: 5140, 6100.
4010 Speech for Broadcasting (3) Fundamentals of today's broadcast conditions as they affect planning, production, and oral interpretation of general American speech; Spanish, Italian, German, and French pronunciation strongly recommended but not mandatory. Public Speaking.

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

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

4670 Radio-Television Management (3) Business policies 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 Broadcasting or consent of instructor.

4680 Broadcast Sales Management (3) Problems and approaches of television and radio sales, including case studies in sales development, pricing, promotion, and other problem areas of sales management. Prereq: Introduction to Broadcasting 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. Public affairs program development, 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 policies upon station policies. Particular emphasis upon the unique situation of broadcasting among the media in terms of freedom. 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 stations. Historical trends in program and current programming practices as related to audience requirements, governmental policy, and competitive conditions. Individual program development on both the local station and network levels. Prereq: Introduction to Broadcasting or consent of instructor.

5970 Independent Study (3)

Broadcasting

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

Associate Professors: H. H. Howard, Ph.D. Ohio; I. G. Simpson, M.S. Syracuse.

Assistant Professors: F. A. Lester, M.A. Tennessee; M. K. Sidell, Ph.D. Northwestern; R. A. Shirley, M.A. Tennessee.

3560 Television and Radio Advertising (3) Principles and practices underlying successful radio- and television advertising; emphasis on media research, rate structure, programming, creativity; instruction in television commercials.

3650 Radio-Television Writing (3) Theory and technique of writing all types of broadcasting scripts except news and dramas. Special events, interviews, musical scripts, radio talks, and promotion material. Emphasis on commercials.
of the major field, investigative procedures, and report writing.

5210 Government and the Press (3) Historic and current problems in the relations of executive, judicial, legislative, and regulatory segments of the government and the press. 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 how the press in turn is influenced by 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 agriculture, politics, labor, finance, science, for technical as well as general publications. Prereq: Reporting or Editing for Mass Media.

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

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

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

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

5970 Independent Study (3)
College of Education

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 in Education, 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 and the School Planning Laboratory are integral parts of the Bureau of Educational Research and Service.

EDUCATIONAL OPPORTUNITIES PLANNING CENTER

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

SCHOOL PLANNING LABORATORY

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