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 for the first time to offer instruction in agriculture. This later was expanded to include research for the development of new knowledge and extension for dissemination of such knowledge to rural people. Today, the Institute has four main divisions: College of Agriculture, College of Veterinary Medicine, Agricultural Experiment Station, and Agricultural Extension Service. In addition to agriculture and veterinary medicine, the Institute conducts research and extension programs in home economics.

Agricultural Experiment Station

Dorsey M. Gossett, Dean
Thomas J. Whatley, Associate Dean
John I. Sewell, Assistant Dean

The Agricultural Experiment Station was established in 1887 by an act of Congress known as the Hatch Act. The purpose of the Experiment Station is to promote fundamental and applied research on all problems primarily affecting the people of Tennessee, but also having national and international implications. The research program embraces studies of the productivity of soils, plants, animals, other capital and people and the combination of these resources necessary to maintain a viable agriculture. Specific research projects relate to development of new and improved crop varieties, insect, disease, and weed control methods, cultural and harvesting techniques, and improved genetics, nutrition, physiology and management of livestock. Other studies deal with various aspects of processing and distributing food and fiber, consumer preferences, food safety and nutritional needs and maintenance of institutions to serve people.

The results of investigations are carried to the clientele in the form of bulletins, circulars, and reports through the Agricultural Extension Service, and the state educational system through the Colleges of Agriculture and Education.

Headquarters as well as the Main Station of the Agricultural Experiment Station are located at Knoxville. Eleven branch stations are located across the state. These stations are essential as research laboratories to test the performance of crop and livestock enterprises grown under different soil, climatic, and environmental conditions. The locations of the Branch Stations are as follows:

- Ames Plantation near Grand Junction includes 18,500 acres (about 10,000 acres in forest). The resources are held in trust by the Hobart Ames Foundation for use by the Institute of Agriculture. Large scale experiments involve forestry, farm management, crop production, and genetics and management of beef cattle and swine.
- Dairy Experiment Station near Lewisburg is operated in cooperation with USDA/SEA/AR. Major emphases are genetics, physiology, nutrition, and management of dairy cattle. Production, handling and preservation of feed for dairy cattle are also being evaluated along with waste management systems.
- Forestry Experiment Stations and Arboretum at Oak Ridge, Tullahoma, and Wartburg. The 250-acre arboretum at Oak Ridge places emphasis on woody plants.
- Tobacco Experiment Station is located near Greeneville. Extensive research on all phases of burley tobacco is in cooperation with USDA/SEA/AR. In addition, research is underway with beef cattle and other field crops.
- UT Martin - The research farm, adjacent to the UT Martin campus, is used for both research and teaching. The research staff at Martin, jointly employed by the Experiment Station and the School of Agriculture, cooperate with other station personnel in planning and conducting research on field crops, beef cattle, dairy cattle, and swine. Emphasis is on problems of importance to the northwestern part of the state.
- West Tennessee Experiment Station is located at Jackson. Major emphases are all phases of production on agronomic crops produced in the western part of the state. In addition, research deals with problems associated with fruit and vegetable production and dairy production. The USDA/SEA/AR cooperates with research on the soybean cyst nematode.
Agricultural Extension Service

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

The Agricultural Extension Service serves the entire state of Tennessee. This educational service of the Institute of Agriculture is active in every county extending information on agriculture, home economics, and related subjects to farm families and other citizens.

This educational organization was established July 1, 1914, by an act of Congress commonly known as the Smith-Lever Act. Staff members of the Agricultural Extension Service use a wide range of methods—farm and home visits, educational meetings, field demonstrations, publications, and mass media—in providing educational programs for people who do not have the opportunity to enroll in resident courses of instruction at colleges.

Extension staff members develop and carry out programs to meet the specific needs of the residents of their counties. They work with both adults and youth. Educational activities for boys and girls are carried out through 4-H Clubs which are organized in schools and in communities.

County, state, and federal governments cooperate in carrying out the Agricultural Extension Service program. The United States Department of Agriculture, the State of Tennessee, and each county government provide the financial support. Any county which appropriates funds for the program may have an office located there to serve its residents. Most offices are located in county seat towns. Headquarters for the Agricultural Extension Service is at Knoxville and district administrative offices are located in Cookeville, Knoxville, Chattanooga, Nashville, and Jackson.

As a distinct administrative unit of the Institute of Agriculture, the Agricultural Extension Service works closely with the other units of the Institute—the Agricultural Experiment Station, the College of Agriculture, the College of Veterinary Medicine—in providing a total program of research, instruction, and extension for developing the agriculture of the state.

College of Agriculture

O. Glen Hall, Dean

Curricula in Agriculture

Broad opportunities for individuals to prepare for a future in agriculture, forestry, and wildlife and fisheries science are offered in the College of Agriculture. The college provides curricula leading to the degrees of Bachelor of Science in Agriculture, Bachelor of Science in Agricultural Engineering, Bachelor of Science in Forestry, and Bachelor of Science in Wildlife and Fisheries Science.

The professional degree program in agricultural engineering receives strong support from the College of Engineering and is fully accredited by the Accreditation Board for Engineering and Technology. The forestry curriculum is fully accredited by the Society of American Foresters.

A pre-professional curriculum in veterinary medicine is offered in the college. This program is designed to prepare students for admission to the College of Veterinary Medicine located on the Knoxville campus. Students pursuing programs leading to the degree of Bachelor of Science in Agriculture major in one of several specialized areas of agriculture offered in the college. These major areas are areas of agricultural economics and rural sociology, agricultural education, agricultural mechanization, animal science, food technology and science, ornamental horticulture and landscape design, and plant and soil science. Specific courses required for each of these areas are given under the departmental headings in this section of the catalog. A student must complete the curriculum outlined by the department in which the student is majoring in order to receive a degree. In all areas of specialization, particular emphasis is placed upon the sciences as a background for agricultural instruction; other courses are included to provide a liberal education. In all subject matter departments there is the opportunity to select elective courses appropriate to the educational objectives of individual students. The choice of electives in each curriculum should be made with the guidance of the faculty adviser.

All academic and general requirements of the University as stated in the front section of this catalog must be met by agricultural students, and they must complete the requirements in one of the organized curricula. Students transferring into the College of Agriculture from other than the UTK campus must have a grade point average of 2.0. Each curriculum leading to the degree of Bachelor of Science in Agriculture includes the requirements of the basic curriculum for agriculture. For this degree, the minimum requirement is 198 quarter-hour credits. A minimum of 45 hours in agricultural courses is required. For the Bachelor of Science in Forestry and the Bachelor of Science in Wildlife and Fisheries Science, the minimum requirement is 196 quarter-hour credits. For the degree of Bachelor of Science in Agricultural Engineering, the minimum requirement is 199 quarter-hour credits.

The use of transfer credit in technical agriculture appropriate to each organized curriculum will be considered and approved by the adviser of that curriculum and the dean of the College of Agriculture. When desirable, validating or proficiency examinations may be requested to determine competence in an area and to avoid repetition. Such examinations should be taken during the first quarter in residence and must be conducted under the supervision of the head of the department in which the course is offered.

A minimum of 27 quarter hours of upper-division technical agriculture appropriate to a specified major requirement, and approved by the major adviser, is completed in residence to fulfill the requirements of baccalaureate degrees offered in the college.

Satisfactory/No Credit Courses

Students may include a maximum of 30 hours in non-directed electives taken on a satisfactory/no credit basis in the total hours required for graduation.

Graduate Study in Agriculture

MASTER OF SCIENCE PROGRAMS

Programs of graduate study leading to the Master of Science degree are offered in all departments in the College of Agriculture. See the Graduate Catalog for details.

A Winter Short Term for Agricultural Extension personnel and other professional agricultural workers is held each year during the last half of the winter quarter. Those attending must be accepted by The Graduate School. Students may take three courses and earn nine quarter hours of graduate credit toward the Master of Science degree. A number of courses are offered annually in agricultural extension education and in other departments in the Colleges of Agriculture and Home Economics. Additional information and a five-year schedule of course offerings may be obtained by writing to Professor R. S. Dotson, Head, Department of Agricultural Extension Education, College of Agriculture, Knoxville.

DOCTORAL PROGRAMS

Graduate study programs lead to the Doctor of Philosophy degree in animal sciences, agricultural economics, home economics, agricultural engineering, food technology and science, and plant and soil sciences.

General requirements and policies of The Graduate School of The University of Tennessee relating to the Graduate School, residence, language, research, examination, and admission to candidacy shall apply to these programs and are described in the Graduate Catalog.

Facilities

The College of Agriculture uses the facilities on the agricultural campus, on University farms located near Knoxville, and on the main University campus. On the agricultural campus are found the main agricultural building, Morgan Hall; the Agricultural Engineering Building; McCord Hall; the Dairy Products Building; McLeod Food Technology Building; C. E. Brehm Animal Sciences Building, which includes a large pavilion; Ellington Plant Sciences Building which houses the plant science departments; and greenhouses for teaching and research. The buildings which have been erected recently provide facilities comparable to the best in the country for the departments which they serve.

Four farms adjacent to or within eight miles of the agricultural campus are used both for instructional and experimental purposes. Morgan Farm (80 acres), Cherokee Farm (550 acres), Plant Science Farm (212 acres), and a livestock farm (510 acres) provide excellent field laboratory facilities for instructional programs offered in the College. Cherokee Woodlot (120 acres), the Oak Ridge Forest (2,260 acres), and Ames Plantation (8,000 acres) of forested areas provide excellent facilities for field work in forestry.

Transportation by bus is provided for classes of agricultural students from the agricultural campus to the University farms and to other points of interest where instruction may be given. Transportation by bus is provided between the agricultural campus and the main University campus so that students may make a change between classes without undue inconvenience.
The facilities of the University on the main campus are available to agricultural students. Courses in the basic sciences, business, communications, engineering, etc., are open to agricultural students and are taught on the main University campus.

**Selection of Curriculum**

Agricultural students who have determined their area of special interest may choose the curriculum most adaptable to their needs. Students who register as freshmen, and an adviser from the department will be assigned for their counseling. It is not necessary, however, that freshman students select their curriculum until the end of the first year. Those who are in doubt will be assigned a special adviser to assist them in exploring agriculture and to guide them in the planning of appropriate courses of study for the freshman year. When they choose a curriculum, an adviser will be assigned from that department.

Students with special interest in science, business, or production technology should consult the adviser about selection of appropriate electives. A foundation for advanced study beyond the baccalaureate degree may be established in any curriculum if appropriate electives are included; also, courses may be elected in any of the curricula leading to the degree of Bachelor of Science in Agriculture, in preparation for employment with the Agricultural Extension Service. For this purpose, both the major-curriculum adviser and the agricultural-extension adviser should be consulted.

A very careful choice of electives enables a student with an above average academic record to complete a double major by satisfying all the requirements in each curriculum. For this purpose, the advisers of each curriculum should be consulted, the dean of the College of Agriculture should be informed, and each adviser should maintain a complete record of the student's progress.

**Optional Minors:** Agricultural students may have single or multiple minors in agriculture or in other colleges recorded on their transcripts without regard to course overlap among majors and minors. A minor in a department of the College of Agriculture requires a minimum of 24 credit hours in courses numbered 2000 and above with the majority of credits from courses numbered 4000 level. At least 12 of the credit hours required for the minor must be completed at UTK. Specific requirements are listed by each department offering a minor. Minors offered in the College of Agriculture are open to students of other colleges who have the approval of their advisor and department.

Students who transfer to the College of Agriculture from another institution, or from another college in UTK, should consult the dean if in doubt about the curriculum they wish to follow and for assignment to an appropriate adviser. Requests for substitutions or special examinations should be submitted for consideration by the College in the first quarter of study in the selected curriculum.

**BASIC CURRICULUM FOR AGRICULTURE**

All students except those majoring in ornamental horticulture and landscape design working for a degree of Bachelor of Science in Agriculture will include in their course of study the following minimum requirements.

The sequence and the selection of courses not specified will be guided by the adviser.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture 1110</td>
<td>Introduction to Social Science for Agriculture</td>
<td>4</td>
</tr>
<tr>
<td>Agriculture 1120</td>
<td>Introduction to Agricultural Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Agriculture 1130</td>
<td>Animal Science for Agriculture</td>
<td>4</td>
</tr>
<tr>
<td>Agriculture 1140</td>
<td>Plant Science for Agriculture</td>
<td>4</td>
</tr>
<tr>
<td>Agriculture 1150</td>
<td>Food Technology and Science for Agriculture</td>
<td>4</td>
</tr>
<tr>
<td>Agricultural Science</td>
<td>(courses listed in departmental course catalog)</td>
<td>26</td>
</tr>
</tbody>
</table>

**Agricultural Science** (courses listed in departmental course catalog)

- Mathematics 140-50-60 (general mathematics) 12
- Biological Science. (entomology and plant physiology, biology, botany, microbiology, or zoology) 12
- Physical Science. (Chemistry 1110-20-30 or 1510-20-30 and physics or geology) 16
- Social Science and Humanities. (Economics 2110-20 and electives, 12 hours—not more than 3 hours in any area) 18
- Other Courses or Electives Hours Specified

**TOTAL:** 198 hours

*Equivalent hours courses.*

For the Mathematics elective, 26-60 hour sequence may be necessary in some courses of study.

**Electives**—See Agricultural Business and Agricultural Economics.

The five basic courses in agriculture are not departmental, but the course contents and content were prepared by a group of experienced teachers representing the appropriate subject-matter areas. They are presented by a team of teachers who work together in developing material in each course.

The five courses are required of all agricultural students, except those majoring in ornamental horticulture and landscape design, who seek the degree of Bachelor of Science in Agriculture, and the five teaching teams coordinate their work carefully to insure a unified program. A major purpose of this basic program is to present freshman agricultural students an appropriate concept of modern agriculture, its role in our economic and social structure, the unity among its several segments, and its relation to other areas of study. Basic subject-matter concepts are presented to provide suitable foundations for further study. These courses serve as strong motivation for study in the physical, biological, and social sciences, and are prerequisite to advanced courses in technical agriculture.

An Honors Seminar is offered as a challenge to exceptional students who desire to explore in greater depth some special topic of unusual significance to agriculture. A team of faculty members shares in this seminar as participants and resource people. The students gain experience and are encouraged to assume responsibilities not available in formally organized courses. Association with students and faculty from all phases of agriculture in the study of a common problem provides an unusual challenge.

**COURSE LOAD**

Students desiring to take more than 12 hours per quarter must have the approval of the dean of the College.

**Agricultural Economics and Rural Sociology**

**AGRICULTURAL BUSINESS CURRICULUM**

Advisers: Professor Martin; Associate Professors Brocker, McLemore, Mundy, Park and Whipple.

This curriculum is designed to prepare students for employment in the rapidly expanding field of agricultural business. Selection of courses will be determined after consideration of the student's major. Recognition is given to the desire of many college graduates to continue to work with agriculture through many private and public services where major emphasis is in areas other than farm production. This program emphasizes particularly those capacities needed for the management phases of agricultural business. Course offerings in the College of Business Administration have been used freely in this curriculum.

Preparation is given for such work in crops, livestock and poultry marketing, fertilizer and feed business, cooperative business management, agricultural credit agencies, farm real estate and appraisal services, agricultural representatives with banks, public and private market analysis, agricultural journalism, and farm information services utilizing mass communications.

Minor in Agricultural Business consists of 30 credit hours including Economics 2110-20, Agricultural Economics 3120 or 3320, Agricultural Economics 4140 or Accounting 2110. Selection of courses should be made in consultation with the Dean of the College.

Preparation is given for such work in crops, livestock and poultry marketing, fertilizer and feed business, cooperative business management, agricultural credit agencies, farm real estate and appraisal services, agricultural representatives with banks, public and private market analysis, agricultural journalism, and farm information services utilizing mass communications.

**TOTAL:** 198 hours

*Selected from the following with no more than two courses from any one department: Management 1510-20, 2510-20, Philosophy 2510-20 or 2570, Psychology 2510-20 or 2570, Psychology 2560 or 2530, Sociology 1030, 3130.*
**Agricultural Economics and Rural Sociology Curriculum**

Advisers: Professor Martin; Associate Professors Brooker, McElemore, Mundy, Park, and Whipple

This curriculum is designed to provide students with training in the social sciences as well as in the physical and biological sciences and agricultural engineering. Recognition is given to the diversity of many college graduates to work in agriculture where the major emphasis is in farm production and related areas. Students are prepared for positions such as farm managers, dairy agents, agriculturalists, farmers, sales and purchasing, farm operations, agricultural journalists, and farm loan agents. This curriculum also provides the necessary background for graduate work in agricultural economics.

**Freshman**

<table>
<thead>
<tr>
<th>Hours</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture 1110-20-30-40-50</td>
<td>20</td>
</tr>
<tr>
<td>Biology 1210</td>
<td>8</td>
</tr>
<tr>
<td>English 1010 or 1011; 1020; 1031 or 1032 or 1033</td>
<td>9</td>
</tr>
<tr>
<td>Mathematics 1540-50-60 or 1840-50-60</td>
<td>12</td>
</tr>
</tbody>
</table>

**Sophomore**

<table>
<thead>
<tr>
<th>Hours</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Economics 3120</td>
<td>3</td>
</tr>
<tr>
<td>Economics 3111-20-30 or Economics 3110-20-30 and 3 hours economics electives</td>
<td>9</td>
</tr>
<tr>
<td>Psychology 2500 or 2530 or 2540</td>
<td>12</td>
</tr>
<tr>
<td>Sociology 3010, 3130</td>
<td>18</td>
</tr>
</tbody>
</table>

**Junior**

Agriculture 3240 | 3 |

**Senior**

**Agricultural Education**

Advisers: Professors Wiegens and Craig; Associate Professor Todd

The curriculum in agricultural education is planned in cooperation with the College of Education. All agricultural education courses are offered in the College of Education. This curriculum is designed to prepare students for entering professional agricultural educational service. Graduates are qualified to teach vocational agriculture. The curriculum also provides training for those who wish to enter farming, industry, and governmental services associated with agriculture, and other occupations.

The senior courses in agricultural education (except Ag. Ed. 4110) are taught at selected off-campus centers. These courses are scheduled concurrently each quarter during the regular school year. Students should file applications for student teaching in the agricultural education department at least two quarters prior to the quarter in which the student teaching is desired.

Students meeting the requirements for general vocational agriculture certification may secure endorsement for professional horticulture and agricultural mechanics by meeting the following requirements:

**Ornamental Horticulture**—18 quarter hours of courses in ornamental horticulture and landscape design and/or plant and soil science. Subject matter areas must include plant propagation, greenhouse management, growing media, landscape design, and nursery management.

**Agricultural Mechanics**—18 quarter hours of courses in agricultural mechanization. Subject matter areas must include agricultural power and machinery, soil and water conservation, and agricultural structures.

**Freshman**

<table>
<thead>
<tr>
<th>Hours</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture 1110-20-30-40-50</td>
<td>16</td>
</tr>
<tr>
<td>Introductory biological sciences</td>
<td>12</td>
</tr>
<tr>
<td>English 1010 or 1011; 1020; 1031 or 1032 or 1033</td>
<td>9</td>
</tr>
<tr>
<td>Mathematics 1540-50-60</td>
<td>12</td>
</tr>
</tbody>
</table>

**Sophomore**

Agriculture 1150 | 4 |

**Junior**

Agriculture 3240 | 3 |

**Senior**

**Agricultural Engineering**

Advisers: Professors Wiegers and Craig; Associate Professors and Technology. Industry, government agencies, research and testing organizations, and foreign service offer employment opportunities to agricultural engineers.

The minimum requirements for admission include two units of algebra, one unit of geometry, and one-half unit in trigonometry. Students may remove deficiencies by registering for special classes during the freshman year.

The curriculum gives training in the fundamentals of engineering applied to problems of agriculture. In the senior year, the comprehensive design of systems and their components is emphasized.

Graduates may pursue careers in design, analysis, or development in these following specialties areas: agricultural power and machinery, agricultural structures and environment, electric power and processing, soil and water conservation engineering, and food engineering.

The curriculum provides for elective courses which can be taken in the student's area of interest. Students should check with their advisers each quarter regarding the selection of courses.

Students majoring in agricultural engineering are eligible to participate in the Engineering Cooperative Scholarship program, Engineers' Day program, and other student activities in the College of Engineering. They are eligible for selection in Tau Beta Pi and Alpha Zeta. Agricultural engineering majors interested in the Cooperative Engineering Scholarship program should consult with the head of the Department of Agricultural Engineering.

**Freshman**

<table>
<thead>
<tr>
<th>Hours</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Engineering 1130</td>
<td>3</td>
</tr>
<tr>
<td>Agricultural Engineering 1130-40</td>
<td>3</td>
</tr>
<tr>
<td>Basic Engineering 1130-20-30 or 1510-20-30</td>
<td>12</td>
</tr>
<tr>
<td>Basic Engineering 1140</td>
<td>2</td>
</tr>
<tr>
<td>English 1010 or 1011; 1020; 1031 or 1032 or 1033</td>
<td>9</td>
</tr>
<tr>
<td>Mathematics 1840-50-60</td>
<td>12</td>
</tr>
</tbody>
</table>

**Sophomore**

Agriculture 1150 | 4 |

**Junior**

Agriculture 3240 | 3 |

**Senior**

**Agricultural Engineering Curriculum**

Advisers: Professors Luttrell, Bledsoe, and Henry. Associate Professors: Tompkins and Wilhelm.

The College of Agriculture, with the cooperation of the College of Engineering, offers a four-year curriculum leading to the degree of Bachelor of Science in Agricultural Engineering. The curriculum is fully accredited by the Accreditation Board for Engineering Education. The curriculum includes the following requirements:

- **Freshman**
  - Agriculture 1110-20-30-40-50
  - Introductory biological sciences
  - English 1010 or 1011; 1020; 1031 or 1032 or 1033
  - Mathematics 1540-50-60

- **Sophomore**
  - Agriculture 1150

- **Junior**
  - Agriculture 3240

- **Senior**
  - Agriculture 3240

The curriculum includes the following requirements:

- **Freshman**
  - Agriculture 1110-20-30-40-50
  - Introductory biological sciences
  - English 1010 or 1011; 1020; 1031 or 1032 or 1033
  - Mathematics 1540-50-60

- **Sophomore**
  - Agriculture 1150

- **Junior**
  - Agriculture 3240

- **Senior**
  - Agriculture 3240

**Agricultural Education**

**Agricultural Engineering**

Advisers: Professors Wiegers and Craig; Associate Professors and Technology. Industry, government agencies, research and testing organizations, and foreign service offer employment opportunities to agricultural engineers.

The minimum requirements for admission include two units of algebra, one unit of geometry, and one-half unit in trigonometry. Students may remove deficiencies by registering for special classes during the freshman year.

The curriculum gives training in the fundamentals of engineering applied to problems of agriculture. In the senior year, the comprehensive design of systems and their components is emphasized.

Graduates may pursue careers in design, analysis, or development in the following specialties areas: agricultural power and machinery, agricultural structures and environment, electric power and processing, soil and water conservation engineering, and food engineering.

The curriculum provides for elective courses which can be taken in the student's area of interest. Students should check with their advisers each quarter regarding the selection of courses.

Students majoring in agricultural engineering are eligible to participate in the Engineering Cooperative Scholarship program, Engineers' Day program, and other student activities in the College of Engineering. They are eligible for selection in Tau Beta Pi and Alpha Zeta. Agricultural engineering majors interested in the Cooperative Engineering Scholarship program should consult with the head of the Department of Agricultural Engineering.

**Freshman**

<table>
<thead>
<tr>
<th>Hours</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Engineering 1130</td>
<td>3</td>
</tr>
<tr>
<td>Agricultural Engineering 1130-40</td>
<td>3</td>
</tr>
<tr>
<td>Basic Engineering 1130-20-30 or 1510-20-30</td>
<td>12</td>
</tr>
<tr>
<td>Basic Engineering 1140</td>
<td>2</td>
</tr>
<tr>
<td>English 1010 or 1011; 1020; 1031 or 1032 or 1033</td>
<td>9</td>
</tr>
<tr>
<td>Mathematics 1840-50-60</td>
<td>12</td>
</tr>
</tbody>
</table>

**Sophomore**

Agriculture 1150 | 4 |

**Junior**

Agriculture 3240 | 3 |

**Senior**

**Agricultural Engineering Curriculum**

Advisers: Professors Luttrell, Bledsoe, and Henry. Associate Professors: Tompkins and Wilhelm.

The College of Agriculture, with the cooperation of the College of Engineering, offers a four-year curriculum leading to the degree of Bachelor of Science in Agricultural Engineering. The curriculum is fully accredited by the Accreditation Board for Engineering Education.

**Agricultural Engineering**
A. Business and Industry Electives

3

Agricultural Mechanization

Agricultural Economics

3

Option electives

Agricultural Mechanization

Agricultural Economics

3

generally in the areas of management, to the broad industry of agriculture.

CURRICULUM

AGRICULTURAL MECHANIZATION

Student’s adviser prior to registration in the course.

Agricultural engineering elective group: any two of

Agricultural Economics

Accounting

Food Technology and Science

Agricultural Extension

Speech

Plant and Soil Science

Physics

Chemistry

English 1010 or

Biology

Graduates are employed in industry, government, and educational institutions generally in the areas of management, promotion, sales, and training related to agricultural products, materials, and services.

Freshman

Hours Credit

Agriculture 1110-20-30-40-50

20

Biolog 1230

4

English 1010 or 1011; 1020; 1032 or 1033

9

Mathematics 1540-50-60

12

Sophomore

Agricultural Mechanization 2110

3

Agricultural Mechanization 2120

3

Animal Science 2810

3

Chemistry 1120-20 or 1510-20-30

12

Economics 2110-20

8

Journalism 2210

3

Physics 1210-20

8

Plant and Soil Science 2130

3

Speech 2311

4

English or communications elective

3

Junior

Accounting 2110

3

Entomology and Plant Pathology 3210

4

Agricultural Mechanization 3100

4

Agricultural Mechanization 3110

3

Agricultural Mechanization 3210-20

6

Agricultural Mechanization 3510 or 3560

4 or 3

Computer Science 1410 or Office Administration 2750

3

Microbiology 2919-11

4

Plant and Soil Science 3220

3

Social science or humanities electives

6

Option electives

6

Electives

9 or 10

Senior

Agricultural Economics 3410 or 3440 or 3610

3

Agricultural Economics 4710

4

Agricultural Mechanization 4120

1

Agricultural Mechanization 4130

1

Agricultural Mechanization 4310

1

Agricultural Mechanization 4210-20

7

Agricultural Extension 3110

3

Food Technology and Science 3020 or 3840 or 4410

4 or 3

Special science or humanities electives

6

Option electives

9

Electives

11

TOTAL: 198 hours

Agricultural Economics 4240

Agricultural Economics 4320

Agricultural Mechanization 3560

Agricultural Mechanization 4180

Agricultural Mechanization 4170

Agricultural Mechanization 4160

Animal Science 3100

Animal Science 3110

Animal Science 3510

Animal Science 3510

Food Technology and Science 3840

Food Technology and Science 4410

Forestry 1620

Forestry 3130

Plant and Soil Science 3110

Plant and Soil Science 3120

Plant and Soil Science 3510

Plant and Soil Science 3520

Ornamental Horticulture 3510

Agricultural Extension Education

Advisers: Professors Dotson, Dickson and Carter.

No formal undergraduate curriculum is offered in agricultural extension education, but undergraduate courses are available as electives in each formal curriculum. Courses are designed to: (1) develop in prospective extension workers and other interested students an understanding of the functions, responsibilities, and techniques of the Cooperative Agricultural Extension Service, and (2) provide prospective extension workers with practical extension work experience in selected training counties. Graduating majors and minors are offered in agricultural extension education. Graduate courses are designed to develop in present extension workers and other interested students those competencies needed for improving the effectiveness of their work. Professor Dotson will give guidance for desired emphasis in agricultural extension education.

Animal Science

Advisers: Professors Barth, Lidvall, McLaren, Montgomery, Richardson, Shirley, Shrode; Associate Professors Backus, Hitchcock, Holloway, Manusquin, Robbins; Assistant Professors Heitmann, Kateshe, Robbins, and Smalling.

This curriculum is designed to prepare students for leadership careers in livestock and in related industries. Swine, poultry, sheep, dairy, and beef cattle production and management may be involved, providing the opportunity for special or additional training in the dynamic livestock and husbandry technology (production). Through course selection, the student, therefore, may prepare for general or livestock farming, management, business, or science, or elect the pre-veterinary courses preparatory for specialization. Elective selection permits special training for work with feed companies, meat animal, milk, egg, or poultry production, managerial or marketing groups, other educational agencies, supply and equipment business, agricultural extension services, agricultural communication, public relations, and various organizations associated with agriculture.

Students have the opportunity, through appropriate course selection, to obtain double majors by combining the animal science curriculum with another curriculum. Students majoring in the animal science curriculum may if they desire arrange to minor in various other curricula. The requirements for these minors shall be stipulated by the department supervising that particular curriculum. Students majoring in other curricula may opt to minor in animal science.

A minor in animal science consists of 28 credit hours including 2610, 2810, 3210, 3310, 3410, 3510 and one 3600 course and one 4800 course.

Students outside of the College of Agriculture should add Agriculture 1130-39. Requests for substitution of similar courses in biology or zoology will be considered on an individual basis. It is suggested that the 3600 and 4800 series deal with the same class of live animals.

Freshman

Hours Credit

Agriculture 1110, 1130, 1140

12

Biology 1210, 1230

8

Chemistry 1110, 1120, or 1510-20

8

English 1010 or 1011, 1020, 1031 or 1032

9

Mathematics 154-50-60 or 1840-50-60

12

Sophomore

Agriculture 1120, 1150

8

Animal Science 2610, 2810 (core requirement)

7

Chemistry 1130 or 1530, and 3211-19 or 2230, or Biochemistry 3110, or Nutrition 3110

11

Economics 2110-20 or 2130

6

Microbiology 2910-11

4

Plant and Soil Science 2130

3

Physics elective

4

Speech 2311 and communication elective

7

Electives

2

Junior

Non-animal science agricultural electives

6

Animal science (core requirement: Animal Science 3210, 3220, 3330, 3410, 3420, 3510) or Animal Science 3330, 3410, 3420, 3510

24

Directed electives—evaluation

3

Communications elective

2

Electives

9

Humanities-social science electives

6

Senior

Non-animal science agricultural electives

6

Animal Science 4910 (core requirement)

2

Directed electives

27

Humanities-social science electives

27

TOTAL: 198 hours

*Or equivalent honors courses.

Electives allow students to select an area for specialization. Those interested in production would select additional courses in agriculture, in business administration, economics, agricultural economics, finance, and accounting; in research in chemistry, zoology, physics, and statistics, etc. Electives should be chosen with career objectives in mind and in consultation with the adviser.

PRE-VETERINARY MEDICINE OPTION CURRICULUM

Advisers: Professors Barth, Lidvall, McLaren, Montgomery, Richardson, Shirley, Shrode; Associate Professors Backus, Hitchcock, Holloway, Manusquin, Robbins; Assistant Professors Heitmann, Kateshe, Robbins, Smalling.

This program is designed to guide the student in meeting the admissions
requirements of The University of Tennessee College of Veterinary Medicine. The completion of specific subject matter requirements and the attainment of a satisfactory grade point average comprise the minimum requirements for entrance into the professional curriculum of the College of Veterinary Medicine. However, each year the number of applicants is much greater than the number of available spaces. Therefore, meeting or surpassing the minimum requirements does not assure acceptance by the College of Veterinary Medicine, and each pre-veterinary medical student should, early in the college career, elect a possible alternative career choice. The admission requirements listed below are those required by The University of Tennessee College of Veterinary Medicine. Their completion will generally fulfill the requirements for other veterinary colleges. However, students intending to apply to schools other than The University of Tennessee College of Veterinary Medicine should check the requirements of those specific schools. Students intending to apply to The University of Tennessee College of Veterinary Medicine must complete a minimum of 119 hours. They must complete their pre-veterinary requirements by the end of the spring quarter of the year in which they are applying. It is strongly recommended that each intending student complete the program of courses and laboratories.

The Pool Program

Inquiries concerning possible course substitutions and the combining of the pre-veterinary program with a degree program should be directed to the department's pre-veterinary advisers. It is possible for students who are accepted into the College of Veterinary Medicine at the end of their third year to receive a B.S. in Agriculture with a major in animal science upon successful completion of the first year in the College of Veterinary Medicine (3 and 1 program). See the College of Veterinary Medicine section in this Catalog for additional information.

A suggested schedule for the Pre-veterinary Medicine—Animal Science student is given below which will allow for the completion of the above pre-veterinary requirements by the end of the third year, and (2) allow the student to make normal progress toward completion of the requirements for a degree in agriculture with a major in animal science and (3) complete the requirements for the 3 and 1 program. It is strongly recommended that the student carry a normal load of at least 16 to 18 hours per quarter. See College of Veterinary Medicine admissions requirements for minimal course requirements for admission to the professional program in the College of Veterinary Medicine (page 73).

First year

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
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<tbody>
<tr>
<td>English 1010 or 1011; 1020; 1031</td>
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</tr>
<tr>
<td>Mathematics 1540; 1550, 1560</td>
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</tr>
<tr>
<td>Biology 1210-20-30</td>
<td>12</td>
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<tr>
<td>Chemistry 1120-30</td>
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<td>Agriculture 1130*</td>
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<tr>
<td>Humanities electives</td>
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Second year

<table>
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</tr>
<tr>
<td>Chemistry 2219-29-39</td>
<td>9</td>
</tr>
<tr>
<td>Physics 2210-20-29</td>
<td>12</td>
</tr>
<tr>
<td>Agriculture 1110*</td>
<td>4</td>
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<tr>
<td>Economics 2110*</td>
<td>4</td>
</tr>
<tr>
<td>Speech 2311</td>
<td>4</td>
</tr>
<tr>
<td>Animal Science 2610-2*; 2610-4*; 3320*; and 3330* and 3410*</td>
<td>17</td>
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</table>

Third year

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Biochemistry 4110-20</td>
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</tr>
<tr>
<td>Microbiology 2610-19*</td>
<td>5</td>
</tr>
</tbody>
</table>

Economics 2120* ..................... 3
Social science electives .......... 2
Humanities electives .............. 8
*Animal science 3420; 3600 level evaluation (3 hrs), 4800 level production management (4 hrs) ........ 10
**Electives ......................... 14

TOTAL: 155 hours

No undergraduate curriculum exists in the Dept. of Entomology and Plant Pathology, but a program leading to the Master of Science degree with a major in entomology and plant pathology is available (see Graduate Catalog). Courses in economic entomology, plant pathology, soil microorganisms, and plant parasitic nematodes are available to agricultural students. The department is currently composed of two major disciplines: economic entomology and plant pathology. The primary objective of offering a major at the graduate level is to provide training in those disciplines which deal with the natural hazards that are the major causes of losses in agricultural production. The training gives such a graduate the foundation necessary for coping with the myriad insect and plant disease problems that constantly threaten Tennessee's dynamic agriculture.

Food Technology and Science

Advisers: Professors Miles, Collins, and Jaynes; Associate Professor S. Melton; Assistant Professor Mount.

Food technology and science is the application of the sciences and engineering to the manufacture, preservation, transport, and consumer use of food products. Processing of raw food materials into consumer products by canning, freezing, dehydrating, fermenting, preserving, etc., is taught with emphasis on basic principles rather than on specific commodity procedures. Therefore, men and women who plan to enter food technology must have an interest in the sciences, particularly chemistry, biology, microbiology, and physics. This curriculum is designed to prepare students for a professional career in positions in the food industry such as food microbiologist, food chemist, quality evaluation and control supervisor, plant foreman and manager, packing specialist, ingredients specialist, etc. The Model Curriculum of the Institute of Food Technologists was used as a guide in developing this curriculum. A special problem course provides opportunity for practical training in food processing plants and laboratories or federal and state laboratories.

Freshman

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours Credit</th>
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<tbody>
<tr>
<td>Agriculture 1110-20-30-40-50</td>
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<td>Biology 1220*</td>
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<tr>
<td>English 1010-20-33</td>
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</tr>
<tr>
<td>Mathematics 1540-50-60</td>
<td>12</td>
</tr>
<tr>
<td>Physics 1210-20*</td>
<td>8</td>
</tr>
<tr>
<td>Sophomore</td>
<td></td>
</tr>
<tr>
<td>Agriculture 1120</td>
<td>4</td>
</tr>
<tr>
<td>Chemistry 2110-20-30</td>
<td>12</td>
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<tr>
<td>Economics 2120*</td>
<td>4</td>
</tr>
<tr>
<td>Microbiology 2310-19*</td>
<td>5</td>
</tr>
<tr>
<td>Speech 2311</td>
<td>4</td>
</tr>
<tr>
<td>Communications electives</td>
<td>6</td>
</tr>
<tr>
<td>Humanities-social science electives</td>
<td>9</td>
</tr>
<tr>
<td>Junior</td>
<td></td>
</tr>
<tr>
<td>Agricultural Mechanization 310*</td>
<td>12</td>
</tr>
<tr>
<td>Chemistry 2230; Nutrition 3300-30-39</td>
<td>12</td>
</tr>
<tr>
<td>Food Technology and Science 3200, 4130, 4140</td>
<td>10</td>
</tr>
<tr>
<td>Microbiology 3810</td>
<td>9</td>
</tr>
<tr>
<td>Nutrition 3200</td>
<td>3</td>
</tr>
<tr>
<td>Plant and Soil Science 3610</td>
<td>3</td>
</tr>
<tr>
<td>Statistics 3210</td>
<td>3</td>
</tr>
<tr>
<td>Humanities-social science electives</td>
<td>3</td>
</tr>
<tr>
<td>Nutrition elective</td>
<td>3</td>
</tr>
<tr>
<td>Senior</td>
<td></td>
</tr>
<tr>
<td>Food Technology and Science 4010</td>
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</table>
Food Technology and Science 4200, 
4300 4810, 4920... 14
Food Science 4010... 3

Upon completion of the four-year forest resource management curriculum including the recreation option, the degree of Bachelor of Science in Forestry (B.S.F.) is awarded. Minor in Forestry consists of 24 credit hours from any courses having a Forestry designation. Prerequisites will not be waived.

Freshman

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botany 111-20 or Biology 1210-20...</td>
<td>8</td>
</tr>
<tr>
<td>English 1010 or 1011; 1020; 1031 or...</td>
<td>9</td>
</tr>
<tr>
<td>Forestry 1620; 3000...</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics 1700, 1841-51...</td>
<td>12</td>
</tr>
<tr>
<td>Physics 1210 and 1220 or 2210 and...</td>
<td>8</td>
</tr>
<tr>
<td>Speech 2311...</td>
<td>4</td>
</tr>
<tr>
<td>Electives...</td>
<td>2-3</td>
</tr>
</tbody>
</table>

FORESTREY

The profession of forestry is the science, art, and practice of managing and using for human benefit the natural resources which occur on and in association with forest lands. Benefits are derived from the multiple resources of the forest: wood, water, wildlife, recreation, forage, and environmental amenities. Foresters are managers of these resources. Thus, our principal instructional objective is to provide the broad education needed to deal effectively with the complex of forest resources.

FOREST RESOURCE MANAGEMENT OPTION

The Forest Resource Management Option provides an opportunity to obtain an education related to the management of the broad spectrum of woodland resources. In addition to the core of required courses, there are about 30 elective credit hours for broad studies of specialized training in one or more areas of forestry. These areas and examples of related fields of study include:

- Forest Biology—plant physiology and morphology, ecology, genetics, tree nutrition, and forest nutrition.
- Forest Business Management—economics, accounting, finance, marketing, management science.
- Forest Economics—economics, business administration, social sciences.
- Forest Engineering—mathematics, computer science, photogrammetry.
- Forest Inventory—mathematics, statistics, computer science, photogrammetry.
- Forest Recreation—natural and social sciences.
- Wildlife Management—ecology, zoology, botany.

The University has over 21,000 acres of forest land available for teaching, research, and demonstration. The Tennessee Valley Authority, Great Smoky Mountains National Park, and Cherokee National Forest provide additional land and facilities available to the teaching program. Within these areas there is a wide variety of tree species and forest types ranging from elements of the boreal forest to southern pines and hardwoods.

Lumber, pulp and paper, and other wood-using industries cooperate in conducting tours and demonstrating industrial processes.

TOTAL: 198 hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Botany 111-20 or Biology 1210-20...</td>
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</tr>
<tr>
<td>English 1010 or 1011; 1020; 1031 or...</td>
<td>9</td>
</tr>
<tr>
<td>Forestry 1620; 3000...</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics 1700, 1841-51...</td>
<td>12</td>
</tr>
<tr>
<td>Physics 1210 and 1220 or 2210 and...</td>
<td>8</td>
</tr>
<tr>
<td>Speech 2311...</td>
<td>4</td>
</tr>
<tr>
<td>Electives...</td>
<td>2-3</td>
</tr>
</tbody>
</table>

Freshman

<table>
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<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Botany 111-20 or Biology 1210-20...</td>
<td>8</td>
</tr>
<tr>
<td>English 1010 or 1011; 1020; 1031 or...</td>
<td>9</td>
</tr>
<tr>
<td>Forestry 1620; 3000...</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics 1700, 1841-51...</td>
<td>12</td>
</tr>
<tr>
<td>Physics 1210 and 1220 or 2210 and...</td>
<td>8</td>
</tr>
<tr>
<td>Speech 2311...</td>
<td>4</td>
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<tr>
<td>Electives...</td>
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Sophomore

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Chemistry 1510-20...</td>
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</tr>
<tr>
<td>Computer Science 1410...</td>
<td>3</td>
</tr>
<tr>
<td>Economics 2110-20...</td>
<td>6</td>
</tr>
<tr>
<td>Forestry 3000...</td>
<td>3</td>
</tr>
<tr>
<td>Forestry 3050 or Ornamental Horticulture and Landscape Design 3810 or Botany 3030...</td>
<td>3-4</td>
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<tr>
<td>Accounting 2110 or Political Science 3555 or 3585...</td>
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TOTAL: 198 hours

<table>
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Sociology 1510...</td>
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<tr>
<td>Sociology 3130 or 3010 or Rural ...</td>
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<tr>
<td>Sociology 3420 or Psychology 3120...</td>
<td>4</td>
</tr>
<tr>
<td>Psychology 2500...</td>
<td>4</td>
</tr>
<tr>
<td>Plant and Soil Science 2310...</td>
<td>4</td>
</tr>
<tr>
<td>Journalism 2210...</td>
<td>3</td>
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<tr>
<td>Electives...</td>
<td>3-4</td>
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Junior

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Forestry 3020, 3110, 3240, 3520, 4300...</td>
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</tr>
<tr>
<td>Wildlife and Fisheries Science 3220...</td>
<td>3</td>
</tr>
<tr>
<td>Plant and Soil Science 3610...</td>
<td>3</td>
</tr>
<tr>
<td>Forest 4120 or Ornithology and Plant Pathology 3140 or 3210...</td>
<td>3</td>
</tr>
<tr>
<td>Agricultural Mechanization 2130...</td>
<td>3</td>
</tr>
<tr>
<td>Speech 3011 or 3021 or Journalism 3710...</td>
<td>3</td>
</tr>
<tr>
<td>Recreation 3140...</td>
<td>3-4</td>
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<tr>
<td>Electives...</td>
<td>18-21</td>
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Senior

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Forestry 3210, 4210, 4230, 4240, 4320...</td>
<td>20</td>
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<tr>
<td>Planning 4100...</td>
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<tr>
<td>Ornamental Horticulture and Landscape Design 3610...</td>
<td>3</td>
</tr>
<tr>
<td>Forestry 4450...</td>
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<td>Electives...</td>
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TOTAL: 198 hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Sociology 1510...</td>
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<tr>
<td>Sociology 3130 or 3010 or Rural ...</td>
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<tr>
<td>Sociology 3420 or Psychology 3120...</td>
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<tr>
<td>Psychology 2500...</td>
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<tr>
<td>Plant and Soil Science 2310...</td>
<td>4</td>
</tr>
<tr>
<td>Journalism 2210...</td>
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</tr>
<tr>
<td>Electives...</td>
<td>3-4</td>
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</tbody>
</table>

Forest, Wildlife and Fisheries

Adviser: G. Schneider

The department offers two majors. The major in forestry leads to the degree Bachelor of Science in Forestry and the major in wildlife and fisheries science leads to the degree Bachelor of Science in Wildlife and Fisheries Science. The forestry major has three options, Forest Resource Management option, Forest Recreation Option, and Wood Utilization Option.

Total: 198 hours
60. For entering students who have some math credit, through 1641, transfer credit for 1640 will be given. 
*Enough electives must be taken to total 198 hours including: a minimum of 6 hours of communications electives selected from a Department of Forestry, Wildlife and Fisheries approved list and a minimum of 11 hours of social science and/or humanities courses.

1These electives should be selected from an approved list of technical electives available from the Department of Forestry, Wildlife and Fisheries.

WILDLIFE AND FISHERIES SCIENCE

Wildlife and fisheries management is the science and art of maintaining populations of wild animals at levels consistent with the best interests of wild species themselves and of the American public. Management goals may be aesthetic, economic, or ecological. Success depends upon wildlife and fisheries biologists giving assistance in attaining the goals for which they strive; scholarly application of scientific information and methods to these goals; ecological pertinence; and execution of programs to maintain past successes, to prevent repetition of past failures, and to prepare for future needs.

The four-year curriculum includes courses in the field of wildlife and fisheries science, the degree of Bachelor of Science in Wildlife and Fisheries Science is awarded. Minor in Wildlife and Fisheries Science consists of 24 hours as follows: 3230, any three (3) courses from the following: 4450, 4460, 3810, 4290, 4300, 4670, and 9 additional hours taken from a list of approved courses maintained in the Department of Forestry, Wildlife and Fisheries. Prerequisites will not be waived.

**Freshman**

<table>
<thead>
<tr>
<th>Course</th>
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<th>Credit</th>
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<tbody>
<tr>
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<td>Mathematics 1700, 1841-51</td>
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<tr>
<td>Computer Science 1510</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>English 1010 or 1011; 1020; 1031 or 1032 or 3933</td>
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<td></td>
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<tr>
<td>Speech 2311</td>
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<tr>
<td>Forestry 1620</td>
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<td>Forestry 3000</td>
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<td>Mathematics 1120 or 2210</td>
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**Sophomore**

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<tr>
<th>Course</th>
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<tbody>
<tr>
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<tr>
<td>Forestry 3000</td>
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<tr>
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<td>Animal Science 3210</td>
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<tr>
<td>Computer Science 1410</td>
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<tr>
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**Junior**

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<thead>
<tr>
<th>Course</th>
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<th>Credit</th>
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<tbody>
<tr>
<td>Zoology 3060, 4240</td>
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<tr>
<td>Wildlife and Fisheries Science 3230</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Forestry 3110, 3320</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Plant and Soil Science 3120</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Botany 3020</td>
<td>4</td>
<td></td>
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<tr>
<td>Agricultural Mechanization 3210</td>
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<tr>
<td>Electives</td>
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**Senior**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zoology 4200, 4660</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Wildlife and Fisheries Science 4450, 1600</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Wildlife and Fisheries Science 4510, 3900</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Forestry 4210</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td>21</td>
<td></td>
</tr>
</tbody>
</table>

**Total:** 198 hours

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**Ornamental Horticulture and Landscape Design**

Adviser: Professor Crater

Human needs go beyond food, clothing, and shelter. We require a degree of control over environs, especially immediate surroundings. Ornamental plants and their uses are recognized as part of the environment, hence a curriculum in ornamental horticulture and landscape design. The four areas of study within this curriculum are floriculture, nursery management, turfgrass management, and landscape design.

The area of floriculture includes the science of producing flowering plants in field and greenhouse, and the art and science of using these plants for the benefit of humans. Opportunities are available as greenhouse managers, floral designers, retail salespersons, garden writers, research workers, and teachers.

Nursery management deals with the growing of trees, shrubs, and other ornamental plants for sale. Skills necessary to be a nursery manager include horticultural knowledge and plant sense. Students in this area are prepared to work in nurseries, garden centers, botanical gardens, and arboretums. They may find opportunities also in research, teaching, writing, sales, and landscape maintenance.

Turfgrass management includes all aspects of growing and caring for turfgrass, whether it be golf greens or home lawns. The increasing number of golf courses and home lawns and the emphasis on better quality make new opportunities for turfgrass managers. Such opportunities include golf course superintendents, park and recreational turf managers, operation of a lawn maintenance business, producer and seller of sod, research, teaching, and sales.

Lanscaping means modifying the outdoor environment for the greatest use, comfort, and enjoyment. It not only means the use of trees, shrubs, and other plant material to accomplish this goal, but it also means having an understanding of the requirements for working, recreation, and housing. Emphasis in the area of landscape design is on plant material and design courses. Opportunities in this area include landscape nursery operation, landscape design, garden center operation, allied, sales highway landscaping, park development, research, teaching, and writing.

Minor in Ornamental Horticulture and Landscape Design consists of 27 hours as follows: required courses: 3030, 3110, 3210, 3610, and at least 13 hours of upper-division OHLD electives. Prerequisites will not be waived.

**Freshman**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture 1400; 1110 or 1130</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Introductory biological science</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>English 1010 or 1011; 1020; 1031 or 1032 or 1033</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Mathematics 1540-50-60</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Physics 1210 or 2210 or Geology 1410</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Social science or humanities electives</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**Sophomore**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Credit</th>
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<tbody>
<tr>
<td>Agriculture 1210</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Orn. Hort. and Landscape Design 2230, 3610</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Chemistry 1510-20-30 or 1110-20-30</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Economics 2110-20</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Speech 2311</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>English or communications electives</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Social science or humanities electives</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Plant and Soil Science 2130</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Junior</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Social science or humanities electives</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Nutrition 3310 or Chemistry 2230 or Chemistry 3211 and 3219</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**Entomology and Plant Pathology 3310, 3210**

**Plant and Soil Science 3210, 3210**

**Orn. Hort. and Landscape Design 3300, 3110, 3210, 3410, 3610**

**Orn. and landscape design electives**

**Directed Electives**

**Senior**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil and Plant Science 3040</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Orn. Hort. and Landscape Design 3910, 4610</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>2 Agricultural electives</td>
<td>9-11</td>
<td></td>
</tr>
<tr>
<td>2 Orn. and landscape design electives</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>5 Electives</td>
<td>23</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL:** 198 hours

1Or equivalent honors courses.

2Students should consult with departmental adviser for selected suggested electives and suggested course of study.

3Or equivalent plant physiology course.

4Mathematics 1540-50-60 may be substituted for students with high mathematics scores.

6To be selected from Agricultural Economics 3430, 4310, Agriculture Mechanics 2110, 2130, 4170, 4180, Plant and Soil Science 3616, 3710, 4120.

**Plant and Soil Science**

Advisers: Professors Raymonds, Seatz, Coffey, Associate Professors Allen, Lesman, and Reich Assistant Professor Miles

Plant and soil science deals with field and vegetable crops and soils. Plant science includes crop breeding and genetics for crop improvement and the introduction of new varieties, crop management for high quality products, and weed control for efficient crop production.

Soil science includes studies in soil formation and classification for better understanding of our soil resources; soil management skills for efficient crop production; knowledge of soil conservation; soil fertility for utilizing fertilizers efficiently; and basic studies in chemistry, physics, and biology as they apply to the soil and to a better understanding of its properties and proper use.

The plant and soil scientist must have a knowledge of the basic physical and biological sciences and, in addition, be trained in communication science, management, and computer skills. After graduation, they may be broadly trained or may specialize in a more specific phase of the subject. Regardless of interest, many good jobs are available for the well-trained plant and soil scientist.

Employment opportunities depend upon the individual's type of training and interest. For the person who is scientifically inclined, positions are available in research with both public and private agencies. For those who wish to apply their knowledge to problems of practice, positions are available with the Agricultural Extension Service as service agents or as specialists, with the Soil Conservation Service and Forest Service, Farmers Home Administration, Production Credit Association, and other public agencies. Many plant and soil scientists are employed in private industry as technical specialists, supervisors, and salespersons. Banks and other financial institutions employ plant and soil scientists as appraisers and farm managers. Others may farm on their own, or manage farms for others, or work in foreign agricultural programs. Certainly, plant and soil science is basic to all agriculture, and people trained in this important field will find many opportunities to serve in modern agriculture.
Institute of Agriculture

A minor in Plant and Soil Science consists of 24 credit hours including 2130, 3020, 3040, and at least 14 elective hours to be taken by electing two (2) courses from Group A and two (2) courses from Group B. 3610 will not be accepted as a course to meet minor requirements.

Each student selecting this major must complete the basic curriculum for agriculture and fulfill the major group requirements. The course plan in plant and soil sciences showing the manner in which the required courses may be taken by years is as follows:

<table>
<thead>
<tr>
<th>Freshman</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture  1110-30-40-50</td>
<td>16</td>
</tr>
<tr>
<td>Lower-division biological sciences</td>
<td>12</td>
</tr>
<tr>
<td>English 1010 or 1011; 1020; 1031 or 1032; 1033; 1034</td>
<td>9</td>
</tr>
<tr>
<td>Mathematics 1540-50-60</td>
<td>12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sophomore</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry</td>
<td>1110-20-30 or 1510-20-30</td>
</tr>
<tr>
<td>Economics</td>
<td>2110-20</td>
</tr>
<tr>
<td>Agriculture</td>
<td>1200</td>
</tr>
<tr>
<td>Plant and Soil Science 2130</td>
<td>4</td>
</tr>
<tr>
<td>Speech</td>
<td>2311</td>
</tr>
<tr>
<td>Physics</td>
<td>3110</td>
</tr>
<tr>
<td>English and communications electives</td>
<td>5</td>
</tr>
<tr>
<td>Social science or humanities electives</td>
<td>9</td>
</tr>
<tr>
<td>Junior</td>
<td>12</td>
</tr>
<tr>
<td>Social science or humanities electives</td>
<td>3</td>
</tr>
<tr>
<td>Biological or physical science electives</td>
<td>12</td>
</tr>
</tbody>
</table>

| TOTAL: 196 hours |

* Or equivalent honors courses.

A special occasion known as Varsity Visit is held during the year. Delegates from all Future Farmers of America chapters are invited to spend a day on the agricultural campus with their advisers. Approximately 500 attended and inspected each department of the College.

Credit for Cooperative Work

A maximum of nine quarter hours of credit may be earned by supervised employment on approved jobs. To receive credit, the student must receive the recommendation of the employer, must present a satisfactory written report, and must receive a passing grade from the University professor in charge. Employment periods shall be not less than 12 weeks. At least one quarter must be spent in study on the campus between periods of employment. Prerequisites: Junior classification, with grade point average of 2.2 or above; and permission of the department head and the dean of the College of Agriculture to register. Three credit hours each quarter.

Short Courses and Special Events

Practical short courses in agriculture are offered for those who desire special training in certain fields. Some of these short courses are held on the Knoxville campus, others at the Buford Ellington 4-H Club Training Center, Milan, Tennessee, or appropriate research stations. The Resident Instruction, Research, and Extension staffs join in teaching these special courses annually, and others are offered to meet immediate needs for special instruction. These are service courses and do not carry college credit.

In-service training is provided special groups, such as the teachers of vocational agriculture, through short-term courses which are offered at convenient locations in the state.

A special occasion known as Varsity Visit is held during the year. Delegates from all Future Farmers of America chapters are invited to spend a day on the agricultural campus with their advisers. Approximately 500 attended and inspected each department of the College.

Departments of Instruction

Interdepartmental Offerings

Agriculture (088)

1110 Introduction to Social Sciences for Agriculture (4) Social sciences as they relate to agriculture—agriculture in the economy; tools of social science analysis applied to agricultural problems; agriculture, its development, relation to man, industry, and government. 4 hrs. and 1 lab.

1120 Introduction to Agricultural Engineering (4) Agricultural power and machinery fundamentals, agricultural structures, soil and water conservation controls, and agricultural uses of electricity. 3 hrs. and 1 lab.

1130 Animal Science for Agriculture (4) Animals in agriculture: body systems and development; principles of inheritance, fundamentals of feeding, and function of farm animals. Animal sanitation, animal products, and the relationship to public health. 3 hrs. and 2 labs.

1140 Plant Science for Agriculture (4) Plant structure, physiology, heredity, and environment in relation to growth, adaptation, and management of crops. 2 hrs. and 2 labs.á

1150 Food Technology and Science in Agriculture (4) Utilization, processing, and distribution of food products. 3 hrs. and 1 lab.

4018 Honors: Seminar (3) Selected topics. Offered alternate years. Open to juniors and seniors by invitation.

GRADUATE

5120 Teaching Internship in Agriculture (1)

Departmental Programs

Agricultural Economics and Rural Sociology

Professors:
- J. A. Martin (Head), Ph.D.; Minnesota; M. B. Badenhop, Ph.D.; Purdue; J. R. Brookier, Ph.D.; Florida; C. L. Oslund, Ph.D.; Wisconsin; Irving Dubov, Ph.D.; California (Berkeley); L. H. Kolter, Ph.D.; Kentucky; T. H. Kildn, Ph.D.; Kentucky; F. G. Leuthold, Ph.D.; Wisconsin; D. L. McLemore, Ph.D.; Clemson; R. R. McManus, Ph.D.; Purdue; B. H. Penecost, Ph.D.; Tennessee; W. P. Ranney (Emeritus), Ph.D.; Minnesota; C. B. Sappington, Ph.D.; Illinois; T. J. Whaley, Ph.D.; Purdue.

Associate Professors:

Assistant Professors:

Agricultural Economics (047)

2410 Economics of Food and Rural Resources (3) Analysis of contemporary problems and issues of public concern relating to food, agriculture, and rural areas using fundamental economic concepts. Farm income, food prices, world food problems, natural resources, environment, rural development.

3120 Agricultural Prices (3) Factors affecting prices in agricultural production/processing/distribution; prices in an enterprise economy, competitive, monopoly, and oligopoly pricing, space, form and time price differences; tools to measure price; farm price programs. Prereq: Agric. 1110 and Economics 2120 or consent of instructor.

3320 Marketing Farm Products (3) Survey of the U.S. food and fiber marketing systems; marketing options of farmers and agribusinesses; industry structure in market channels for agricultural products; basic tools to analyze marketing problems. Prereq Agric. 1110 and Econom. 2120 or consent of instructor.


3430 Agricultural Law (4) Survey of law and application to the farmer, his family, and agricultural industry. Property, contracts, torts, drainage and water rights, landlord-tenant relationships, taxation and insurance, forms of business organization, estate planning, regulatory laws, and other selected topics.

3440 Farm Income Tax Management (3) Legal and economic concepts and problems in organizing and managing a farm business within the framework of federal income tax laws. Emphasis is on recognizing problem areas, utilizing tax planning incentives, and avoiding legal traps that may be encountered in organizing the business and operating and transferring the farm. Prereq: Junior standing. 3 hrs.

3510 Commodity Futures Markets (3) Futures market as an instrument in marketing of primary industry
5710 Linear Programming (3)
5820 Agricultural Price Analysis (3)
6000 Doctoral Research and Dissertation
6120-30 Seminars in Agricultural Economics (3,3)
6210 Agricultural and Rural Transformation Problems (3)
6410 Agricultural Supply Analysis (3)
6420 Marketing and Resource Use (3)

**Rural Sociology (880)**
5420 Rural Sociology (3) Nature of rural society; social systems concept; rural-urban differences; nature of social relations; population characteristics and movement; problems of rural people; tenancy, farm labor, health, services, educational facilities; churches, local government; impact of industrialization.

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

**agricultural engineering**

5000 Thesis
5002 Non-Thesis Graduation Completion (3-15)
5130 Agricultural Production Economics II (3)
5210 Seminar: Agricultural Policy (3)
5220 Research Methodology (3)
5230 Seminar: Adjustments to Industrialization (3)
5310 Research (3)
5410 Agricultural Marketing Analysis (3)
5420 Advanced Land and Natural Resource Economics (3)
5440 Economics of Agricultural Development (3)
5610 Quantitative Methods in Agricultural Economics (3)

5710 Linear Programming (3)
5820 Agricultural Price Analysis (3)
6000 Doctoral Research and Dissertation
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5230 Seminar: Adjustments to Industrialization (3)
5310 Research (3)
5410 Agricultural Marketing Analysis (3)
5420 Advanced Land and Natural Resource Economics (3)
5440 Economics of Agricultural Development (3)
5610 Quantitative Methods in Agricultural Economics (3)
leveling; topographic surveying and mapping; area computation. Prereq: Math 1560 or consent of instructor. 1 hr. and 2 labs.

5100 Seminar (1) Presentations, discussions, reports on research techniques. Prereq: Consent of department head.

5110 Agricultural Mechanics (3) Organizing, equipping, and managing school and farm shops; techniques, materials, and procedures in design and construction of shop projects; metal work and welding. 1 hr. and 2 labs.

5120 Forest Surveying (3) Principles, methods and instruments in measurement of horizontal and vertical distances and angles, with emphasis on forest management applications; computation of traverses, areas and volumes; map types, plotting and drafting. Prereq: Math 1641. 2 hrs. and 1 lab.

5140 Forest Surveying and Mapping (3) Use of low-precision methods of instruments including pacing, Abney level, topographic trailer tapes, hand compass, and staff compass. Field measurements, computations and layouts involving random and true lines, traverses, topographic mapping, and forest roads. Prereq: 2140. Ten periods of 6 hrs. per period.

5210 Soil and Water Conservation Facilities (3) Leveling, topographic surveying; planning, construction, and maintenance of drainage, irrigation, and erosion-control systems. Prereq: Math 1550. 2 hrs. and 1 lab.

5220 Agricultural Structures (3) Functional planning of structures; environmental control, construction methods, properties of building materials, and cost estimation. Prereq: Math 1550. 2 hrs. and 1 lab.

5310 Food Engineering Technology (4) Application of basic engineering principles of food processing. Fluid flow, heat transfer, refrigeration, drying evaporation, and materials handling. Prereq: Agriculture 1120 or Physics 1220. 3 hrs. and 1 lab.

5350 Electrical Systems In Agriculture (3) Electrical terms and fundamentals, distribution, wiring practice, governing codes, control, and motors used in agricultural and residential facilities. Prereq: Physics 1220 or Agriculture 1120. 1 hr. and 1 lab.

4120-30 Seminar (1,1) Presentations, discussions, reports. 4120—Professional development topics, 4130—Industry trip. Prereq: Consent of department head.

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

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

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

4210 Agricultural Machinery and Tractors (4) Agricultural machinery and power units; adaptation to agricultural practices; field efficiencies, capacities, adjustment, and servicing. Prereq: Math 1550. 3 hrs. and 1 lab.

4220 Special Problems in Agricultural Mechanization (3) Selection, analysis, solution, and report of research problem. May be repeated for maximum of 9 credit hrs. when engaged in approved industry work. Prereq: 2150 or 2140. 3 hrs. and 1 lab.

GRADUATE 5000 Thesis 5110 Research Problems in Agricultural Mechanization (3) 5210 Electro-mechanical systems in Agriculture (3) 5410 Agricultural Machinery System Analysis (3) 5610 Selected Topics in Agricultural Mechanization (3)

Agricultural Extension Education (075)

5110 Introduction to Agricultural Extension (3) History, philosophy, organization, teaching methods, relationships with other educational agencies.

5110-20 Field Studies (3,3) Supervised work experience with county extension agents in a designated county. For senior and graduate students. Prereq: 5110 and consent of instructor. Requires living off-campus for a specified time.

GRADUATE 5000 Thesis

5100 Special Problems in Agricultural Extension (1-6)

5210 Long-Range Extension Program Planning (3)

5220 Seminar (3)

5230 Evaluation In Programs of Agricultural Extension (3)

5310 History, Philosophy, and Objectives (3)

5320 Volunteer Leadership in Agricultural Extension Programs (3)

5330 Supervision of Agricultural Extension Programs and Personnel (3)

Animal Science (113)

Professors: C. O. Richardson (Head), Ph.D., Ohio State; K. M. Barth, Ph.D., Rutgers; M. C. Bell, Ph.D., Oklahoma State; J. K. Bleiter (Emeritus), Ph.D., Ohio State; C. C. Chamberlain (Emeritus), Ph.D., Iowa State; O. G. Hall, (Dean, College of Agriculture) Ph.D., Iowa State; S. S. Hansard (Emeritus), Ph.D., Florida; R. E. Lidicky, M.S., Tennessee; J. B. McClaren, Ph.D., Auburn; J. K. Miller, Ph.D., Georgia; J. M. Montgomery, Ph.D., Wisconsin; G. M. Merriman (Emeritus), D.V.M., Michigan State; R. L. Murphy (Emeritus), Ph.D., Wisconsin; H. V. Shirley, Ph.D., Illinois; R. R. Shores, Ph.D., Iowa State; E. W. Swanson, Ph.D., Missouri; R. L. Tugwell (Emeritus), Ph.D., Kansas State; C. E. Wylie (Emeritus), A.M. Missouri.

Associate Professors: W. R. Backus, Ph.D., Tennessee; R. E. Cartee, D.V.M., Kansas State; H. Eiler, D.V.M., Ph.D., Illinois; J. P. Hitchcock, Ph.D., Michigan State; J. W. Holloway, Ph.D., Oklahoma State; F. D. Mesinecup, Ph.D., Kansas State; K. R. Robbins, Ph.D., Illinois; M. H. Sims, Ph.D., Auburn.

Assistant Professors: W. C. Cullen, Ph.D., Minnesota; R. N. Heitmann, Ph.D., Maine; H. G. Kattesh, Ph.D., VIP & SU; K. R. Robbins, Ph.D., Illinois; T. W. Schultz, Ph.D., Tennessee; J. D. Smalking, Ph.D., Texas A & M.


2710 Introduction to Biometrical Aspects of Animal Science (3) Biometrical concepts for optimum comprehension of material presented in upper-division animal science courses. Basic ideas in probability as introduction to concept of distributions. Expected values, variances, tables as most probable values. Binomial and normal distributions and their prevalence in biological material. Planning effective experiments. Association or relationship of variables. Assessment of validity of hypotheses. 2 hrs. and 1 lab.

2810 Farm Animal Management Practices (3) Integration of management practices and skills into cattle, horse, sheep, poultry, and swine enterprises. Practices and skills including marketing, caretaking, docking, food care, shearing, age identification, identification, preparing for show and sale, vaccinating and immunizing, controlling parasites. Facilities needed in livestock management including buildings, fences, corrals, equipment, space requirements, and restraining devices. 2-3 hrs. lab.

2620 Introduction to Light Horses (3) Scope and role of light horse industry; breeds—development, function, and use; unsoundness; tack; introduction to management problems. May not be used by animal science majors to meet graduation requirements. 2 hrs. and 1 lab.

3210 Anatomy and Physiology of Farm Animals (4) Skeletal and joints, skeletal muscles, blood and microcirculation, and cardiovascular, respiratory, digestive, renal, and endocrine systems; demonstration of physiological phenomena. Prereq: Biology 1210 or Agriculture 1120. 3 hrs. and 1 lab.

3220 Physiology of Reproduction (3) Comparative anatomy and physiology of 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.)

3310 Introduction to Animal Nutrition and Feeding (3) Nutrient utilization, function, and requirements of farm animals; animal feeds, nutrient content, and factors affecting feeding value; balancing rations for beef and dairy cattle, sheep, horses, game, poultry, and laboratory animals. Prereq: 3320. 2 hrs. and 2 labs.

3320 Animal Nutrition (3) Properties, functions, utilization, and deficiency symptoms of essential nutrients; nutritive value determinations and their use. Prereq: Agriculture 1130 and one quarter of organic chemistry.

3330 Feeds and Ration Formulation (4) Feedstuffs, additives, feeding standards, nutrient requirements, and ration formulation for beef and dairy cattle, sheep, horses, game, poultry, and laboratory animals. Prereq: 3320. 2 hrs. and 2 labs.

3410 Heredity in Animals (3) Basic chromosomal mechanism of heredity with emphasis on Mendelian principles and exceptions such as linkage and cytoplasmic inheritance. Inheritance and expression basis of heredity and to quantitative inheritance. Illustrations of principles related to species familiar to agriculture students. Prereq: Agriculture 1130. 2 hrs. and 1 lab.

3420 Principles of Animals Breeding (3) Genetic principles involved in breeding of economic species. Genetic basis of variation. Partitioning of variation according to various kinds of causative differences such as differences in genetic makeup and environment. Selection and conscious introgression. Breeding programs and effects on populations. Planning breeding programs. Prereq: 3410 or equivalent. 2 hrs. and 1 lab.

3430 Breeds of Farm Animals (3) Study of evolution and formation of breeds of cattle, horses, poultry, sheep, and swine. Breeds, breed development, characteristics, and improvement programs of various breeds. Prospects for purebred industry and impact of crossbreeding. Prereq: 2 hrs. and 1 lab.

3510 Animal Hygiene and Sanitation (4) Parasitic, viral, and bacterial organisms in farm animals; immunization; control and protection against disease; veterinary medicine, herd health programs. Prereq: Microbiology 2910-11 or 2910-19 or consent of instructor. 3 hrs. and 1 lab.

3520 Avian Diseases (3) Major diseases; characteristics, prevention and treatment; management prac-
Economics returns. Prerequisite: Completion of animal science sophomore and junior core courses or consent of instructor. 3 hrs. and 1 lab.

4630 Pork Production and Management (4) Integration of principles of selection, nutrition, breeding, physiology, and marketing into complete pork production and management programs. Topics will include structure of industry, enterprise establishment, systems of production, production practices, and herd improvement programs. Alternatives evaluated in terms of production responses and economic returns. Prerequisite: Completion of animal science sophomore and junior core courses or consent of instructor. 3 hrs. and 1 lab.

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

4850 Light Horse Production and Management (4) Integration of principles of nutrition, physiology, and breeding into light horse management program. Topics include structure of industry; systems and practices of production; individual animal and herd improvement programs; tack, equipment, and facilities for both pleasure owners and commercial producers. Alternatives evaluated in terms of pleasure, recreation, and economic returns. Prerequisite: Completion of animal science sophomore and junior core courses or consent of instructor. 3 hrs. and 1 lab.

4860 Lamb and Wool Production and Management (4) Integration of principles of selection, nutrition, breeding, physiology, and marketing into complete lamb and wool production and management program. Topics will include structure of industry, enterprise establishment, systems of production responses, and economic returns. Prerequisite: Completion of animal science sophomore and junior core courses or consent of instructor. 3 hrs. and 1 lab.

4910 Seminar (2) Review of literature and presentations on special topics and current research in animal science field. Prerequisite: Senior standing. 1 hr. and 1 lab.

GRADUATE

5000 Thesis

5011 Problems in Lieu of Thesis (1-6)

5110 Special Problems in Animal Science (1-6)

6210 Endocrine Relations in Animal Production (4)

5230 Advances in Mammalian Reproduction (3)

5240 Advanced Studies of the Secretion of Milk (3)

6311 Analytical Techniques in Animal Nutrition (3)

5322 Advanced Experimental Animal Nutrition (3)

5333 Nonruminant Animal Nutrition (4)

5344 Ruminant Animal Nutrition (3)

5410 Genetics of Animal Populations (3)

5510-20 Advanced Animal Physiology (5, 5)

5710 Methods of Evaluating Experimental Data in Animal Science (3)

5720 Design and Interpretation of Experiments in Animal Science (3)

5910 Seminar (1)

6000 Doctoral Research and Dissertation

6211 Advanced Topics in Animal Physiology (1-6)

6220 Environmental Physiology of Farm Animals (3)

6230 Animal Growth and Development (3)

6240 Physiology of the Heart (4)

6311 Advanced Topics in Animal Nutrition (1-6)

6322 Advanced Animal Nutrition (3)

6411 Advanced Topics in Animal Breeding (1-6)

6420 Animal Breeding Research Methods and Interpretation (3)

6910 Seminar (1)

Entomology and Plant Pathology (341)

Professors:

C. J. Southards (Head), Ph.D. North Carolina State; J. W. Hilty, Ph.D. Ohio State; L. F. Johnson, Ph.D. Louisiana State; C. D. Pless, Ph.D. Clemson.

Associate Professors:


3130 Plant Pathology (4) Principles of plant pathology illustrated by diseases of common agricultural crop plants. Prerequisite: Botany 1120 or Biology 1220. 3 hrs. and 1 lab. (Same as Botany 3130.)

3140 Forest Pathology (4) Etiology, recognition, economic impact, and control of forest tree diseases, including wood decay and other diseases important to urban forestry and forest nurseries. Prerequisite: Botany 1120 or Biology 1220 or equivalent. 3 hrs. and 1 lab. No credit if 3130 previously taken.

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

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

4010 Biology of Soil Microorganisms (4) Morphology and physiology of soil organisms, decomposition of organic matter, chemical transformations, and interactions between soil organisms and higher plants. Prerequisite: 3130 or introductory microbiology. 3 hrs. and 1 lab. (Same as Microbiology 4010.)

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

GRADUATE

5000 Thesis

5010 Research Methods and Instrumentation in Plant Pathology and Entomology (3)

5110 Plant Disease Diagnosis (3)

5120 Insect Diagnostic Clinic (3)

5210 Plant Parasitic Nematodes (4)

5220 Plant Disease Control (3)

5250 Field Crop and Vegetable Insects (3)

5240 Plant Virology (4)

5250 Medical and Veterinary Entomology (4)

5260 Insect Pest Management (4)

5310 Special Problems in Entomology (1-6)

5320 Special Problems in Plant Pathology (1-6)

5330 Special Problems in Nematology (1-6)

6410 Seminar (1)

Food Technology and Science (390)

Professors:

J. T. Miles (Head), Ph.D. Wisconsin; J. L. Collins, Ph.D. Maryland; T. B. Harrison (Emeritus), M.S.A. Tennessee; H. O. Jaynes, Ph.D. Illinois; W. W. Overcast (Emeritus), Ph.D. Iowa State.
Associate Professors:
B. J. Demott, Ph.D. Michigan State; S. L. Melton, Ph.D. Tennessee; R. J. Fiemann, Ph. D. Kansas State.

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

Instructor:
O. G. Sanders, M.S. Tennessee.

2200 Food Processing I (3) Introduction to art and sciences of manufacturing food products. 2 hrs. and 1 lab.

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

3300 Food Laws and Regulations (3) State and federal laws concerning food industry. Organization and operation of regulatory agencies. Food grades and standards. Prereq: Agriculture 1150 or 2200 or equivalent.

3570 Evaluation and Grading Dairy Products (3) Market standards and grades of dairy products with practice in grading milk, ice cream, butter, cheese, and other specialized dairy products. 1 hr. and 2 labs.

3610 Meat Evaluation and Grading (3) Grading standards for quality and quantity and principles of evaluating beef, pork, and lamb. Practice in grading and judging carcasses and cuts. 1 hr. and 2 labs.

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

4000 Problems in Food Technology (1-4) Research problems in student's area of interest. Required written report. Supervised experience in state or federal laboratories or approved industries encouraged. May be repeated. Maximum 8 credit hrs. Prereq: Consent of department head.

4100 Food Technology and Science Seminar (1-3) Review of literature; oral and written reports. May be repeated for a maximum of 3 credit hrs. Prereq: Junior standing and consent of instructor.

4300 Dairy Products II (4) Principles in the manufacture of butter, cheese, and special dairy products. Prereq: 3020. 3 hrs. and 1 lab.

4400 Food Chemistry (5) Minerals, fats, oils, and vitamins in food as affected by processing and storage. Prereq: Nutrition 3280 or equivalent. 2 hrs. and 1 lab.

4140 Food Chemistry II (3) Reactions of proteins, carbohydrates, and natural food colorants in foods. Protein structure, food enzymology, and carbohydrates, and natural food colorants in food. Prereq: Microbiology 2510-19 or equivalent. 1 hr. and 2 labs.

4820 Fermented Foods (3) Role of microorganisms in preparing foods with emphasis on development of certain desirable characteristics, flavor, aroma, texture, and keeping quality. Prereq: Microbiology 3610. 2 hrs. and 1 lab.

4820 Meat Products Manufacturing (3) Prepared meat products with emphasis on sausage making and information relating to cost controls, inspection, and meat science. Prereq: 3840 or consent of instructor. 1 hr. and 2 labs.

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

4940 Advanced Meat Science (3) Qualitative and quantitative characteristics of meat and poultry as related to palatability, cookery, preservation, packaging, and merchandising. Prereq: Food Technology and Science 3640.

GRADUATE

5000 Thesis

5200 Seminar (1)

5120 Food Color (3)

5150 Food Enzymology (3)

5140 Food Flavors (3)

5150 Fats and Oils (3)

5200 Research (1-5)

5310 Food Products Development (3)

5320 Food Thermobiology (3)

5420 Advanced Food Quality Assurance (3)

5510 Meat Technology (3)

5530 Microorganisms Common in Food Products (3)

5540 Microbial Cultures in Foods (3)

6000 Doctoral Research and Dissertation (3-15)

6010 Advanced Topics in Food Technology and Science (1)

6410 Advanced Food Processing (3)

Forestry, Wildlife and Fisheries

Professors:
G. Schneider (Head), Ph.D. Michigan State; J. W. Barrett (Emeritus), Ph.D. Syracuse; R. R. Buckner, Ph.D. North Carolina State; J. L. Byford, Ph.D. Auburn; H. A. Core (Emeritus), Ph.D. Syracuse; R. W. Dimmick, Ph.D. Wyoming; M. R. Pelton, Ph.D. Georgia; F. W. Woods, Ph.D. Tennessee.

Associate Professors:

Assistant Professors:
E. F. Dougall, Ph.D. Oregon State

4810 Microbiology in Food Manufacturing (3) Relationship of growth of common food microorganisms in fermentative and enzymatic changes occurring during processing and manufacturing of foods. Prereq: Microbiology 2510-19 or equivalent. 1 hr. and 2 labs.

3000 Current Events in Renewable Natural Resources (3) Current events influencing forestry, wildlife, and fisheries management. Perspectives from other disciplines and professions which are affected by and which influence natural resource management. Extended views of natural resources, their allocation and management. Professional development and education for the disciplines of forestry, wildlife and fisheries. 1 hr. May be repeated. Maximum credit 4 hrs. S/NC. (Same as Wildlife and Fisheries Science 3000.)

3200 Forest Environment and Ecology (3) Environmental and biological aspects and associated lands; emphasis on the application of ecological principles to contemporary problems. Available for graduate credit for non-forestry majors only. Prereq: 8 hrs. of biology, botany, or zoology. 3 hrs.

3400 Dendrology and Silvics of Woody An
giosperms (3) Classification, nomenclature, identification, and silvicultural characteristics of the more common woody angiosperms native to North America; native ranges, distribution patterns, and habitat requirements; regeneration requirements and life history, place in succession, ecological significance and commercial importance. Weekly field trips during scheduled lab period plus one weekend field trip. Available for graduate credit for non-forestry majors only. Prereq: 8 hrs. basic biology or botany. 2 hrs. and 1 lab.

3500 Dendrology and Silvics of Gymnosperms (3) Classification, nomenclature, identification, and silvicultural characteristics of the major North American conifers. Distribution patterns, habitat, and community relationships including classification, life history, regeneration requirements, place in succession, and importance. Available for graduate credit for non-forestry majors only. Prereq: 8 hrs. basic biology or botany. 2 hrs. and 1 lab.

3110 Forest Measurements and Biometry (4) Measurements of individuals in animal and plant populations; linear regression, sampling of forest populations; growth and productivity. Prereq: Plant and Soil Science 3610 and Computer Science 1410 or equivalent. 3 hrs. and 1 lab. Available for graduate credit for non-forestry majors only.

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

3130 Forest Protection (3) Destructive agencies; fire, insects, diseases; development and biocologica l control; prevention and suppression.

3210 Forest Resource Economics (4) Allocation of forest resources via market and institutional systems. Application of economics to forest resource decision making in the private and public sector. Prereq: Economics 2120.

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

3240 Introduction to Forest Recreation (3) Concepts of leisure time in recreation, historical development of forest recreation, forest recreation resources. Development, management, and administration of forest recreation areas and systems.

3250 Ecological Problems of Forest Recreational Land (3) Examination of major forms of ecological impacts occurring on forest recreational lands; emphasis on impact to vegetation, soil, and water quality; consideration of monitoring methods and management alternatives. Weekend field trip is required. Prereq: 3020 or equivalent or consent of instructor. Prereq: Plant and Soil Science 2130 recommended. 2 hrs. and 1 lab.

3320 Principles of Silviculture (5) Influence of site factors on growth, development, and character of forest vegetation; classification of forest structure; silvicultural classes. Prereq: 3020 or Biology 2130; 3040; Plant and Soil Science 2130. 3 hrs.

4002 Utilization (3) Wood-using industries, processing of forest products-sawmills, pulpwood operations, flooring plants, treating plants; plant layout, flow diagrams. Prereq: 3120.
4003 Field Methods of Timber Inventory (4) Field measurements of forest trees; timber cruising; determining appropriate sample design for specific purposes; tree and stand growth; site evaluation; field problems. Prereq: 3110 and Agricultural Mechanization 3140.

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

4006 Silvicultural Methods (4) Methods and application of intermediate and regeneration cuttings; site preparation, planting, and seedling; modifications of growth through fertilizers, irrigation, and other field aids and benefits. Prereq: 3320, 4002, 4003.

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

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

4210 Forestry Organization and Administration (3) Planning, organizing, and leadership concepts and cases; problem analyses and decision making in forestry 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 integration of resource uses; review of traditional timber management concepts; the multiple-use concept; valuation of forest resources for decision making and planning; taxation of forest firm. Prereq: 4210.

4230 Forest Resource Management Plans (4) Field problems and case studies in forest-resource management; the forest as a system; management of forest enterprises as a producer of timber, recreational services, watershed services, and wildlife; producing multiple services; preparation of a complete plan based on optimizing forest uses. Prereq: 4210.

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 interpretative services. Possible overnight field trips required. Prereq: 3240 or equivalent. 2 hrs. and 1 lab.

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

4340 Aerial Photography in Forest-Resource Management (3) Use of conventional aerial photographs in forest-resource management; interpretation of detail, aerial inventories, preparation of cover-type maps, uses of other remotely sensed imagery. Prereq: 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, provenance, selection of superior phenotypes, and development of seed orchards; hybridization; seed production and seed certification. Prereq: 4006 or consent of instructor. 2 hrs. and 1 lab.

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

4440 Forest Recreation (3) Forest lands as a recreation resource; interrelationships of forest recreation and other management activities; development and management of recreation areas; socioeconomic and political determinants of recreation development and management. Possible overnight field trips required. Prereq: 6 credits in sociology and/or economics. Junior standing, 2 hrs. and 1 lab.

4450 Recreational Behavior in Forest Environment (3) Review of sociological and psychological theories relevant to forest recreation planning, management, and administration. Discussion of current recreation phenomena; implementation of conceptual forest recreation resources; and review of methodologies for assessing recreational behavior. Prereq: 3110 or consent of instructor. 3 hrs. and 1 lab. or field period.

4540 Wood Drying and Preservation (3) Concepts of wood drying including wood-moisture relations, specific gravity, moisture content, density, and shrinkage. Discussion of commercial drying practices. Relationship of wood moisture content to attack by wood destroying organisms. Methods and materials used in commercial treating systems. Prerequisites: 3120, Math 1851, Physics 1220 or consent of instructor.

GRADUATE

5000 Thesis

5002 Non-Thesis Graduation Completion (3-15)

5101 Problem Analysis in Forest Resources (3)

5110 Special Problems in Forestry (1-6)

5220 Seminar in Tree Biology (3)

5230 Seminar in Forest Management (3)

5240 Seminar in Forest Genetics (3)

5250 Recreation Planning for Forests and Associated Lands (3)

5260 Industrial Forestry (3)

5270 Topics in Forest Industries Management (3)

5290 Seminar in Forest Biometry (3)

5310 Seminar (1)

Wildlife and Fisheries Science (933)

3000 Current Events in Renewable Natural Resources (1) Current events influencing forestry, wildlife, and fisheries management. Perspectives from other disciplines and professions which are affected by and which influence natural resource management. Extended views of natural resources, their allocation and management, professional development and education for the disciplines of forestry, wildlife, and fisheries. 1 hr. May be repeated. Maximum credit 4 hrs. S/NC. (Same as Forestry 3000.)

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

3230 Wildlife Management (3) Lives and ecological relationships of wild animals; biological, social, and economic aspects of their management. Available for graduate credit for non-forestry and non-wildlife and fisheries science majors only.

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

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

4500 Problems in Wildlife and Fisheries Sciences (1-6) Special research or individual problem in wildlife and fisheries science. Prereq: Senior standing. May be repeated. Maximum 9 credit hrs.

4510 Fish Populations (4) Principles and methods of fish population estimation; sampling techniques and equipment; population dynamics; age and growth.

4520 Fisheries Management (4) Methods of warm and cold water fisheries management including techniques of biological assessment, public relations, habitat management, fish health, and fish and wildlife relations. Prereq: 3110 or consent of instructor. 3 hrs. and 1 lab or field period.

GRADUATE

5000 Thesis

5110 Special Problems in Wildlife and Fisheries Science (1-6)

5210 Seminar in Wildlife Conservation (3)

5310 Seminar (1)

5400 Advanced Topics in Wildlife Science (3)

5450 Wildlife Diseases (3)

5460 Predator Ecology (3)

5500 Advanced Topics in Fisheries Science (3)

5550 Fish Physiology (3)

Ornamental Horticulture and Landscape Design (740)

Professors: G. D. Craig (Head), Ph.D. Ohio State; L. M. Carson, Ph.D. Rutgers; N. D. Peacock (Emeritus), Ph.D. Michigan State; D. B. Williams, Ph.D. Pennsylvania State.


Assistant Professors: D. T. Kendall, M.A. Louisiana State.

Instructor: E. L. Abbott, M.S. Tennessee.

2230 Environmental Horticulture (3) An introduction to awareness and appreciation for ornamental plants and in the home. Design and management of home landscapes including selection, buying, effectively using, planting and caring for trees, shrubs, turf grasses, herbaceous landscape plants and house plants. 3 hrs.

3030 Plant Propagation (3) Physiology, methodology, and environmental requirements for propagation. Prereq: 8 hrs. of biological science. 2 hrs. and 1 lab.

3040 Floral Design (3) Principles and techniques in floriculture including emphasis on arrangements for home, church, and special occasions. 1 hr. and 2 labs.

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

3210 Turfgrass Management (4) Practical turf-grass management including selection, identification, and establishment; basic applied fertility programs, mowing and irrigation practices, and thatch control; pest identification and control. Prereq: Plant and Soil Science 2130 and 8 hrs. biological sciences. 3 hrs. and 1 lab.

3310 Professional Practices in Ornamental Horticulture (3) Application of management and marketing practices for greenhouses, nurseries, flower shops, garden centers, plant stores, and landscaping firms. Investigating of practices and the solution of problems as they relate to the students' area of interest in the establishment and operation of horticultural, nursery, landscape planning and maintenance enterprises, including compliance with governmental regulations and other operational practices specific to the ornamental horticulture industry. 3 hrs.
3410 Basic Floriculture (3) Principles and practices essential to producing major cut flowers and potted plant crops. Application of principles of plant physiology as they relate to the control of flowering, harvesting, and distribution. Prereq: 3110. 3 hrs. and 1 lab.

3510 Grounds Maintenance and Management (4) Identification of landscape maintenance tasks; growth control, irrigation, soil amendments, transplanting, climatic protection, pest control, calibration, maintenance and upkeep of equipment, and management practices. Prereq: 2230. 2 hrs. and 2 labs.

3610 Fundamentals of Landscape Design (4) Development of basic graphic skills and techniques of plan delineation. Fundamentals of the process theory of design, site analysis, program development, design synthesis, introduction to site layout, topographic interpretation, landscape construction materials, and landscape structures. Development of awareness and sensitivity to landscape elements. 1 hr. and 2-3 hr. labs.

3620 Intermediate Landscape Design (4) Application of skills and knowledge acquired in 3610 to a variety of landscape projects. Refinement of graphic skills. History of landscape design as it relates to contemporary applications. Technical aspects of planting design and plant selection. Use of plant materials in design of small and moderate scale landscape situations. Prereq: 3610, 3610 or equivalent. 1 hr. and 2-3 hr. labs.

3630 Landscape Construction and Contracting (4) Application of construction materials, methods and practice concerned with landscape installation and contracting. Site layout procedures, earthwork and drainage with emphasis on materials, applications through detailed drawings and small scale projects. Landscape contracts, specifications and bidding procedures. Prereq: 3310, 3610. Ag. Mech. 2130 recommended. 1 hr. and 2-3 hr. labs.

3810 Basic Landscape Plants (4) Identification, classification, adaptation, culture, and landscape design uses for basic ornamental trees, shrubs, and vines. Prereq: 1 hr. and 2 lab. and 2 hrs. biological science. 3 hrs. and 1 lab.

3820 Supplementary Landscape Plants (3) Identification, classification, adaptation, culture, and landscape design uses for ornamental trees, shrubs, and vines. Prereq: 3810. 1 hr. and 2 labs.

3830 Interior Plants (3) Identification, classification, adaptation, culture and interior uses for foliage and flowering plants. 1 hr. and 2 labs.


4160 Nursery Management (3) Modern management methods for wholesale and retail nurseries, garden centers, and landscape contractors. Prereq: 3310. 2 hrs. and 1 lab.

4180 Park Design (4) Design criteria for parks and outdoor recreation systems. Park site selection, analysis, planning, and management as related to needs and natural and economic resources. Evaluation of aesthetic and functional features of parks and their impact on environmental quality of rural and suburban communities. Prereq: 3620. 2 hrs. and 2 labs.

4190 Advanced Landscape Design (4) Comprehensive application of landscape design skills and knowledge through the completion of a major project. Analysis, programming, planting design, construction detailing, estimating, specifications, contracts and bidding included in total project package. Prereq: 3510, 3620, 3630. 1 hr. and 2-3 hr. labs.

4220 Advanced Turfgrass Management (4) Principles and scientific basis of turfgrass culture: adaptation, ecology, physiology, soil fertility, and grass nutrition; climatic influences; grass diseases; physiology of clipping and water management; traffic effects and compaction; and the physiological influences of pest infestations and control measures. Prereq: 3210, 3 hrs. and 1 lab.

4320 Specialty Floriculture (3) Specific practices in the production of minor cut flowers and potted plant crops. Production methods for scheduling flowering or vegetative growth of specialty florist crops in controlled environments. Prereq: 3410. 2 hrs. and 1 lab.

4400 Individual Problem Study (1-5) May be repeated to maximum of 10 credit hrs.

4510 Seminar (1) Current problems in ornamental horticulture and landscape design. Prereq: Junior standing and consent of instructor.

GRADUATE

5000 Thesis

5100 Special Problems in Ornamental Horticulture and Landscape Design (3)

5210 Golf Course Design, Development, and Management (4)

5310 Park and Public Grounds Management Systems (4)

5410 Historical Microtechnique (4)

5500 Seminar (1)

Plant and Soil Science (792)

Professors:

L. F. Seatz (Head), Ph.D. North Carolina State; F. F. Boll (Emeritus), Ph.D. Iowa State; D. L. Cofley, Ph.D.; D. L. Purdue; B. V. Conger, Ph.D. Washington State; H. A. Fribourg, Ph.D. Iowa State; L. S. Jeffery, Ph.D. North Dakota State; L. M. Josephson (Emeritus), Ph.D.; L. J. Wiscon; W. L. Parks, Ph.D. Purdue; B. S. Picket (Emeritus), Ph.D. Michigan State; J. H. Reynolds, Ph.D.; D. Wisconsin; L. N. Skold (Emeritus), M.S. Kansas State; M. E. Springer (Emeritus), Ph.D. California (Berkeley); H. D. Swingle (Emeritus), Ph.D. Louisiana State.

Associate Professors:


Assistant Professors:

D. E. Dyton, Ph.D. North Carolina State; R. J. Miles, Ph.D. Texas A&M; D. R. West, Ph.D. Nebraska; J. D. Wolf, Ph.D. Auburn.

Chair:

B. Austin Distinguished Professor:

2130 Soils (4) Nature and properties of soils. Physical, chemical, biological processes and their influence on plant growth. Prereq: Chemistry 1120 or 1520 or 1620. 3 hrs. and 1 lab.

3020 Crop Ecology (3) Crops and environment: geographic location; site, heat, light, water, and interplant relationships as a basis for judgment of cultural practices used to modify environmental factors. Prereq: 8 hrs. biological science. 2 hrs. and 1 lab.

3040 Crop Physiology (3) Physiology of crop plants; growth phenomena related to crop production; use of general theories of physiology; effects of season, growth regulating substances, functions of light, heat, air, minerals, and water. 2 hrs. and 1 lab. Prereq: 8 hrs. biological science.

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. Prereq: 2130. 3 hrs. and 1 lab.

3120 Grain and Oil Crops (3) Distribution, improvement, morphology, culture, harvesting, and utilization of corn, small grains, soybeans, and related crops. Prereq: 2130. 8 hrs. biological science. 2 hrs. and 1 lab.

3140 Forage Crops (4) Characteristics, adaptation, improvement, management, and utilization of grasses and legumes for pastures, hay, and silage. Prereq: 2130. 8 hrs. biological science. 3 hrs. and 1 lab.

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

3180 Fruit Crops Management (4) Soils, planting, cultivation, development, and management of fruit crops; pest control, harvesting, packing, storage and pruning. Prereq: Ent. & Pl. Path. 3210, 3130. 3 hrs. and 1 lab.

3200 Soil Management (4) Soil management for crop production including cropping systems, fertilizer use, and drainage operations for specific soil and farming conditions. Prereq: 2130. 3 hrs. and 1 lab.

3250 Soil in Forestry (3) Soil as a medium for tree growth; relation of physical, chemical, and biological properties of soils to forest management of forest stands. Soil properties of importance in road location, recreational development, and watershed management. Prereq: 2130; Forestry 0320. 2 hrs. and 1 lab.

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

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

3610 Interpretation of Agricultural Research (3) Statistics as applied to agriculture. Statistical methods in interpretation of research results. Prereq: Math 1550.

3710 Principles of Weed Science (4) Basic principles of weed science, history, ecology, economic losses, means of control, types of herbicides, and specific recommendations for various crop and non-crop uses. Prereq: 8 hrs. biological science and 3 hrs. organic chemistry. 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. Prereq: 2130; Physics 1210. 3 hrs. and 1 lab.

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

4250 Agricultural Chemicals and the Environment (4) Characteristics, use, mode of action, degradation, and environmental impact of chemicals used in agriculture, forestry, and related areas with emphasis on agricultural pesticides; environmental safeguards imposed by federal and state regulations on chemical development and use. Prereq: One year biological science and one year 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 soils surveys. Prereq: 2130. 3 hrs. and 1 lab.

4400 Problems in Plant and Soil Science (1-6) Special research or library problems in some phase of plant and soil science. May be repeated. Maximum credit 9 hrs.


GRADUATE

5000 Thesis

5100 Special Problems in Plant and Soil Science (1-6)

5200 Soil-Crop Relationships (3-6)

5240 Soil Productivity and Management (3)

5250 Pedology (4)

5310 Design and Interpretation of Experiments (4)
Veterinarians are employed by the U.S. Army and Air Force, and in state, county, or local practices which deal with the diseases of all livestock. The majority of these are in general practice. The college offers graduate studies leading to the degrees Master of Science (M.S.) and Doctor of Philosophy (Ph.D.). Residency training programs in the various clinical specialties are also offered.

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

The college is organized into six academic departments: Animal Science (jointly with the College of Agriculture), Environmental Practice, Microbiology (jointly with the College of Liberal Arts), Pathobiology, Rural Practice, and Urban Practice. Primary objective of the College is to educate veterinarians for private practice. However, the professional curriculum provides an excellent basic medical education, in addition to training in diagnosis, disease prevention, medical treatment, and surgery. Graduates are qualified to pursue careers in many facets of veterinary medicine and related health professions.

Most veterinarians are engaged in private practice. The majority of these are in general practices which deal with the diseases of all kinds of animals. About one-fourth of the veterinarians in the United States are engaged exclusively in pet or companion animal practice. A growing number are concerned with the health problems of zoo animals, laboratory animals, wildlife, and aquatic species.

Veterinarians also find rewarding careers in the U.S. Public Health Service, the U.S. Army and Air Force, and in state, county, or local health agencies. A large number of veterinarians are employed by the U.S. Department of Agriculture and by state departments of agriculture for important work in livestock disease control, meat and poultry inspection, serum and vaccine production, and the protection of our country against the importation of foreign animal diseases. Excellent opportunities exist for veterinarians interested in research. Such opportunities are available at colleges and universities and with governmental agencies, private research institutions, and biological and pharmaceutical companies.

Facilities

Administrative offices of the College of Veterinary Medicine are located in Morgan Hall on the agricultural campus. The Department of Animal Science is housed in Brehm Animal Sciences Building, also on the agricultural campus, and the Department of Microbiology is located in Walters Life Sciences Building on "The Hill" of The University of Tennessee, Knoxville.

The Veterinary Medicine Building on the agricultural campus houses the Departments of Environmental Practice, Rural Practice, Urban Practice, and Pathobiology. Additionally, the Animal Welfare Hospital, clinics, and the Agriculture/Veterinary Medicine Library are contained within this modern structure of 248,000 gross square feet. The college has research facilities on Cherokee Farms adjacent to the UT Hospital. Satellite teaching-research facilities are located in Middle and West Tennessee.

Admission Requirements

Admission to the professional program of the College of Veterinary Medicine is limited to that number for which an education of high quality can be provided with the resources available to the college.

To qualify for admission a candidate must have completed at least the following minimum pre-veterinary requirements:

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<thead>
<tr>
<th>Subjects</th>
<th>Minimum Quarter Credits</th>
<th>Semester</th>
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<tbody>
<tr>
<td>English, including speech</td>
<td>12 8</td>
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<tr>
<td>Humanities</td>
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<td>Social sciences</td>
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<td>Mathematics</td>
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<tr>
<td>Chemistry: general</td>
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<td>Organic</td>
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<tr>
<td>Biochemistry</td>
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<tr>
<td>Physics</td>
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<tr>
<td>Biology or zoology</td>
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<tr>
<td>Microbiology</td>
<td>6</td>
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<tr>
<td>Animal science, including nutrition and genetics</td>
<td>13 11</td>
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*Includes history, literature, music or art appreciation, philosophy, religion, or foreign language.

Pre-veterinary requirements may be completed in any accredited college or university which offers courses equivalent to those at The University of Tennessee.

The Colleges of Agriculture and Liberal Arts of The University of Tennessee offer a three-year pre-veterinary curriculum which satisfies all the course requirements for admission to the College of Veterinary Medicine. Students who are admitted to the College of Veterinary Medicine following completion of this pre-veterinary curriculum will receive a Bachelors degree upon completion of the first year (three quarters) of the professional veterinary medicine curriculum.

Admission Procedure

Admission of new students will be for the fall quarter each year. In order to receive consideration, the candidate must: (1) be a United States citizen or resident alien; (2) be 21 years of age or older; (3) have completed at least one year of college; and (4) be able to demonstrate the proficiency expected of students on admission to the pre-veterinary curriculum.

Forms and instructions for making application for admission may be obtained from:

Director of Admissions
320 Student Services Building
University of Tennessee
Knoxville, Tennessee 37996-0200

Courses of study are available at colleges and universities and with governmental agencies, private research institutions, and biological and pharmaceutical companies. Such opportunities are available to the college. Extra-curricular learning experiences may be available for a limited number of students during the latter half of the final year of the professional veterinary medicine curriculum.

Professional Curriculum

The professional curriculum in veterinary medicine is an 11-academicquarter, year-round program, including summers. The first year (three quarters) consists of preclinical subjects such as anatomy, physiology, microbiology, parasitology, and general pathology. The second year (four quarters) includes the study of diseases, their causes, diagnosis, treatment, and prevention. The final calendar year is devoted to intensive training in the solving of animal disease problems, including extensive clinical experience in the teaching hospital. The curriculum also provides for education in the science and art of veterinary medicine and in paramedical subjects such as animal behavior, medical communication, professional ethics, jurisprudence, economics, and practice management.

FIRST YEAR

Fall Quarter

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Winter Quarter

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Spring Quarter

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Summer Quarter

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<tr>
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</table>

Institute of Agriculture 73
Department of Instruction

Animal Science (114)—Veterinary Medicine

Professors: D. C. Richardson (Head), Ph.D. Ohio State; K. M. Barth, Ph.D. Rutgers; M. G. Bell, Ph.D. Oklahoma State; J. K. Bletter (Emeritus), Ph.D. Ohio State; C. C. Chamberlain (Emeritus), Ph.D. Iowa State; S. L. Hansard (Emeritus), Ph.D. Florida; E. R. Liddell, M.S. Tennessee; G. M. Merriman (Emeritus), D.V.M. Michigan State; J. B. McLennan, Ph.D. Auburn; J. K. Miller, Ph.D. Georgia; J. M. Montgomery, Ph.D. Wisconsin; R. L. Murphree (Emeritus), Ph.D. Wisconsin; N. V. Shirley, Ph.D. Illinois; R. R. Shrode, Ph.D. Iowa State; E. W. Swanson, Ph.D. Missouri; R. L. Tugwell (Emeritus), Ph.D. Kansas State; C. E. Wyke (Emeritus), A.M. Missouri.


Assistant Professors: J. A. Corr, Ph.D. Tennessee; W. G. Cullen, Ph.D. Minnesota; R. Heitmann, Ph.D. Maine; H. G. Kattesh, Ph.D. Rhode Island; J. A. Corrick, Ph.D. Tennessee; J. B. McLaren, Ph.D. Auburn; J. K. Bletner (Emeritus), Ph.D. Ohio State; C. Barth, Ph.D. Rutgers; M. C. Bell, Ph.D. Oklahoma State; J. B. Jones (Head), D.V.M. Illinois; J. W. Oliver, D.V.M. Ph.D. Purdue.


8600 Basic Clinical Rotation in Environmental Practice (3) Introductory clinical experience in laboratory animal and zoological medicine, epidemiology, and other related disciplines.

8611-12 Pharmacology (2,5) Consideration of principles of pharmacokinetics as well as pharmacodynamic properties of veterinary drugs including mode of action, pharmacologic effects, chemical and physical properties, metabolism, toxicities, important idiosyncrasies, and clinical application. Correlated with 8240, 8250, and 8311. 8611: 2 hrs. lecture. 8612: 5 hrs. lecture.


8670 Special Problems in Environmental Practice (2-16) Special problems in public health and epidemiology. May be repeated.

8757 Advanced Seminar in Environmental Practice (1-4) Advanced seminars in various topics such as comparative medicine, public health, epidemiology, and pharmacology.

GRADUATE

5000 Thesis (1-15)

5010 Special Topics in Environmental Medicine (1-3)

5611-12 Pharmacology (1,2)

6000 Doctoral Research and Dissertation (3-15)

6101 Advanced Topics in Environmental Medicine (1-3)

Microbiology (685)—Veterinary Medicine

Professors: A. Brown (Head), Ph.D. Chicago; R. W. Beck, Ph.D. Wisconsin; J. M. Becker, Ph.D. Cincinnati; R. J. Courtenay, Ph.D. Syracuse, T. C. Morris, Ph.D. Maryland; J. O. Mundt (Emeritus), Ph.D. Michigan State; W. S. Reggasy, Ph.D. Yale; B. T. House, B.V.S. University of Bristol (England); Ph.D. University of Guelph (Canada); J. M. Woodward (Emeritus), Ph.D. Kansas; C. J. Wust, Ph.D. Indiana.

Associate Professors: D. A. Brian, D.V.M., Ph.D. Michigan State; G. S. Sayler, Ph.D. Idaho.

Assistant Professors: D. A. Berrie, Ph.D. Cornell; R. M. Moore, Ph.D. Texas-Austin; K. M. Sirokin, Ph.D. Michigan State; G. Stacey, Ph.D. Texas-Austin.

8101 Veterinary Bacteriology and Mycology (5) An introduction to the pathogenesis of bacterial and fungal diseases. Organized as a taxonomic study relating microbial structure, metabolism and genetics to the patterns of disease and the mode of action of antimicrobials. 3 hrs. lecture and 2 labs.

8102 Veterinary Virology (4) Structure and replication of animal viruses, classification of viruses, mechanisms of viral pathogenesis. Techniques for quantitat-
ing viruses, viral antigens, and antiviral antibodies. Fundamental for understanding of the best approaches to viral diagnosis and immunoprophylaxis. 2 hrs. lecture and 2 labs.

8103 Veterinary Immunology (4) Basic concepts of immunology, mechanisms of immune reaction, diagnostic immunology, and the role of the immune response in preserving the integrity of the body as well as in causing disease. 2 hrs. lecture and 2 labs.

8175 Advanced Seminar in Microbiology (1-4) Advanced seminar in various topics in applied microbiology such as serologic diagnosis, clinical immunology.

Pathobiology (742)


Associate Professors: M. D. McCracken, D.V.M. Kansas State, Ph.D. Purdue; R. D. Walker, D.V.M. Ohio State, S. Patton, Ph.D. Kentucky.


8700 Basic Pathobiology Rotation (3) Practice and/or demonstrations in laboratory diagnosis including postmortem examination and clinical pathologic, parasitologic, and microbiologic techniques.

8710 Veterinary Pathology (5) Principles of pathology including causes of disease, disturbances of cell growth, inflammation, and neoplasia. 3 hrs. lecture and 2 labs.

8720 Veterinary Parasitology (4) Basic principles of parasitology (protozoology, helminthology, and entomology) and their relation to disease in animals. 3 hrs. of lecture and 1 lab.

8730 Veterinary Pathobiology (3) Further training in clinical laboratory diagnostic procedures, and in postmortem examinations.

8770 Special Problems in Pathobiology (2-10) Provides student with opportunity to design and execute research problem. May be repeated.

8775 Advanced Seminar in Urban Practice (1-4) Advanced seminars in various specialty disciplines, such as neurology, cardiology, surgery, ophthalmology.

GRADUATE

5000 Thesis (1-15)

6000 Doctoral Research and Dissertation (3-15)

Urban Practice (496)


8800 Basic Clinical Rotations in Urban Practice (12-16) Introductory clinical training in food animal, equine, ambulatory and herd health practices.

8850 Advanced Clinical Rotations in Urban Practice (3-16) Advanced clinical training in food animal, equine, ambulatory and herd health practices.


8875 Advanced Seminar in Rural Practice (1-4) Advanced seminars in various specialty areas such as equine medicine, food animal surgery, clinical toxicology.

GRADUATE

5000 Thesis (1-15)

6000 Doctoral Research and Dissertation (3-15)

Veterinary Medicine (987)

8010 Client Relations and Communication Skills (1) Interpersonal skills as they apply to client relations and communication with other professionals, employees, and the general public. 1 lab. S/NC.

8310 Introduction to Veterinary Medical Practice (2) Animal species, breed identification, basic care, feeding, restraint, and handling. Introduction to physical diagnosis, intravenous techniques, blood sampling, etc. 1 hr. lecture and 1 lab.

8311 Introduction to Veterinary Medical Practice (2) Physical diagnosis, history taking, and client relations; anesthetic principles, agents, and techniques. 1 hr. lecture and 1 lab.

8312 Introduction to Veterinary Medical Practice (3) Basic surgical principles, preparation for surgery, wound healing and suturing; fundamentals of radiology. Correlated with 8320. 2 hrs. lecture and 1 lab.

8320 Medical Science Interaction Laboratory (2) Multidiscipline laboratory designed to provide learning and reinforcement of concepts in the disciplines of physiology and pathology and pharmacology. Application of anesthetic and surgical principles, humane handling of animals, clinical chemistry technique, and introduction to instruments and measures of physiologic processes. Correlated with 8240, 8250, 8611 and 8612. 1 lab. and 1 demonstration.

8340 Integumentary System (4) Diseases of integumentary system of animals, with emphasis on laboratory examination, interpretation of pathologic features, diagnosis, and treatment.

8341 Hematopoietic System (3) Pathogenesis, diagnosis, and clinical management of diseases of hematopoietic and lymphoid organs and tissues.

8342 Alimentary Tract (8) Physiological basis, pathologic, diagnosis, and treatment of diseases of alimentary tract and digestive organs.

8343 Patterns of Disease (5) Host-agent relationships in diseases of animals. Pathology, laboratory diagnosis, control and public health significance. Principles of epidemiology and their application in the study of diseases in animal populations.

8344 Focal Problems (1) Considers specific diagnostic problems or paramedical subjects important to veterinary medical practice: differential etiologic, diagnosis, and treatment of certain diseases in animals. Symptoms; implications for veterinarian of medical jurisprudence and ethics, practice economics, and veterinary history. May be repeated. S/NC.

8350 Reproductive System (6) Diagnosis, therapy and prevention of those conditions causing a reduction of the reproductive efficiency of domestic animals. Applicable condition of the mammary gland with emphasis on diagnosis and prevention of mastitis.


8352 Cardiovascular System (3) Pathology, diagnosis, and management of cardiovascular diseases of animals. Emphasizes the anatomic, physiologic, and pharmacologic principles which provide the basis for medical and surgical treatment.

8353 Endocrine, Metabolic and Nutritional Diseases (4) Biochemical and pathophysiologic mechanisms of endocrine, metabolic and nutritional diseases of animals; their diagnosis, therapy and prevention.

8360 Musculoskeletal System I (5) Pathology, diagnosis, and management of musculoskeletal diseases of large animals with emphasis on functional anatomy, radiographic interpretation, surgical procedures.
Institute of Agriculture

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>8362</td>
<td>Veterinary Toxicology (3)</td>
<td>Basic concepts of toxicology with emphasis on the molecular mechanisms and the pathologic and clinical features of animal diseases caused by common toxic agents.</td>
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</tr>
<tr>
<td>8363</td>
<td>Public Health (2)</td>
<td>Public health aspects of veterinary medicine and nature of related laws, ordinances, and regulations. Veterinarian's role in the protection of environment, ecology, and quantity and quality of food.</td>
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</tr>
<tr>
<td>8364</td>
<td>Animal Dietetics (1)</td>
<td>Applied nutrition of cattle, swine, horses, dogs and cats for the veterinarian. Diets and methods of feeding for both normal and special situations.</td>
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<tr>
<td>8365</td>
<td>Radiology (3)</td>
<td>Advanced and special techniques in radiology; interpretation and use of radiology in diagnosis of clinical cases in medicine and surgery.</td>
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<tr>
<td>8366</td>
<td>Respiratory System (4)</td>
<td>The detection and diagnosis of upper and lower respiratory diseases of domestic animals. Includes the pathophysiology and pathology of infectious and noninfectious diseases.</td>
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<tr>
<td>8370</td>
<td>Neurosciences (9)</td>
<td>Normal and abnormal neural structure and function in animals, with emphasis on clinical neurology and neuropathology.</td>
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<tr>
<td>8371</td>
<td>Visual and Auditory Systems (3)</td>
<td>Methods of examination and treatment of diseases involving eyes and ears of animals, with emphasis on anatomic, physiologic, and pathologic features.</td>
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<tr>
<td>8372</td>
<td>Comparative Medicine (4)</td>
<td>Diagnosis, prevention, and treatment of diseases of laboratory animals, avian species, and marine mammals seen most commonly by practicing veterinarians.</td>
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<tr>
<td>8375</td>
<td>Principles of Medicine (3)</td>
<td>Physiologic and pathologic principles underlying mechanisms of disease. Selected examples of human and animal diseases with particular emphasis on recent scientific advances and their effects on veterinary medicine.</td>
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<tr>
<td>8401</td>
<td>Clinical Radiology (3)</td>
<td>Training in radiographic techniques and in the interpretation of radiographs as part of the diagnostic process. May be repeated.</td>
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<tr>
<td>8402</td>
<td>Special Medical Services (3)</td>
<td>Clinical training in specialty areas such as anesthesiology and ophthalmology, with casework in both urban and rural animal clinics.</td>
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<tr>
<td>8460</td>
<td>Extramural Programs (2-20)</td>
<td>Supervised off-campus educational program with an approved institution; limited enrollment. Prereq: Consent of department and the College of Veterinary Medicine Curriculum Committee.</td>
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<td>Patterns of Disease (5)</td>
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<td>Doctoral Research and Dissertation (3-15)</td>
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