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

Agricultural Experiment Station

Dorsey M. Gossett, Dean
Thomas J. Whatley, Associate 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 the promotion of practical agriculture through fundamental and applied research on all problems affecting farmers of the state. For example, there are research projects dealing with the development of new and improved varieties of farm and garden crops, the development of improved methods for the control of crop insects and crop diseases, and the evaluation of systems for the feeding, pasturing and management of livestock. Also, much attention is given to soils and fertilizers, mechanical devices of importance on the farm, human nutrition, and various rural economic and social problems.

Priority is given to problems of special importance to the farmers of Tennessee. The results of investigations are carried to the people in the form of bulletins, circulars, and reports, through the Agricultural Extension Service, and to the state educational system through the Colleges of Agriculture and Education. Rural life has been greatly enriched by the results of these investigations, as have the curricula of the school system.

Headquarters and the Main Station of the Agricultural Experiment Station are located at Knoxville. In addition, the Experiment Station operates research facilities at other locations in the state as follows:

UT-ERDA COMPARATIVE ANIMAL RESEARCH LABORATORY

This laboratory is located about 20 miles west of Knoxville near Oak Ridge. A program of radiobiological research in the field of agriculture is carried out by the Agricultural Experiment Station under contract with the Energy Research and Development Administration. The program includes research with farm and laboratory animals, and in applied radiobiology and plant breeding.

Facilities at the laboratory include approximately 2,000 acres of land for maintaining livestock and growing plants to be used in experimental work, a research laboratory especially suited to large animal work, and a unique gamma-radiation field.

In 1962, 2,200 acres of forest land near the laboratory area were acquired by the University. An arboretum containing some 250 acres has been established. Emphasis will be on collecting woody plants. In addition, this land will be used for research on recreational use of forested areas and on the adaptation of forest species to soils and other site factors.

THE UNIVERSITY OF TENNESSEE AT MARTIN

On January 1, 1965, the Agricultural Experiment Station was assigned responsibility for administration of the 600-acre farm adjacent to the Martin campus. The farm is used for both research and teaching. At the same time the School of Agriculture at Martin assumed research responsibilities and is working closely with the different departments in Knoxville in planning and executing the research program. Experiments are under way with field crops, horticultural crops, dairy cattle, and beef cattle. The primary concern is with problems of special importance to the northwestern part of the state.

BRANCH STATIONS

Dairy Experiment Station near Lewisburg contains 615 acres and is operated in cooperation with USDA-ARS. Major emphasis is on breeding and nutrition of Jersey cattle.

Highland Rim Experiment Station near Springfield contains 586 acres. Major emphasis is on breeding and culture of dark-fired tobacco, other agronomic crops, and livestock.

Middle Tennessee Experiment Station near Spring Hill contains 1,153 acres of representative high-phosphate Central Basin soils. Studies are under way with field crops, beef cattle, sheep, and dairy cattle of the Holstein breed.

Plateau Experiment Station near Crossville consists of three farms totaling 2,150 acres. Studies with beef cattle, sheep, field and horticultural crops provide information about results to be expected under the cooler, more humid climate and special soil conditions of the Cumberland Plateau.

Tobacco Experiment Station near Greeneville consists of 536 acres. Extensive research on Burley tobacco is conducted in cooperation with USDA-ARS. In addition, beef cattle and field crops are studied.

West Tennessee Experiment Station near Jackson contains 860 acres. Major emphasis is on culture and breeding of cotton, other...
agronomic crops, horticultural crops, and breeding and feeding of dairy cattle.

FIELD STATIONS

Ames Plantation near Grand Junction includes 18,500 acres (about 10,000 acres in forest). The land is in trust by the Ames Foundation for use by the Institute of Agriculture. Large scale experiments involve forestry, farm management, crop production, and breeding and management of beef cattle and swine.

Cumberland Forestry Field Station consists of two tracts in Morgan and Scott Counties with a total area of 9,450 acres.

Friendship Forestry Field Station is located in Hamilton County and consists of 660 acres owned by the TVA. Forestry research is conducted in cooperation with TVA.

Highland Rim Forestry Field Station near Tullahoma includes 860 acres. Research results apply generally on the Highland Rim.

Milan Field Station in west Tennessee consists of 497 acres. Research emphasis is mechanization of the production of cotton, soybeans, and horticultural crops.

Agricultural Extension Service

William D. Bishop, Dean
M.L. Downen, Assistant Dean
Troy W. Hinton, Assistant Dean
Mildred F. Clarke, 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 and 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 reports, and more modern 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, and 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 young people 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, Bachelor of Business Administration, 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 Engineering Council for Professional Development. 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 new 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 areas are: agricultural business, agricultural economics, agricultural education, agricultural mechanization, animal science, food technology and science, ornamental horticulture, land use 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.

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.

Students may include 6 hours of lower division military science and 9 hours of advanced military science credit in the 198 total. A minimum of 45 hours in agricultural courses is required. For the degree of Bachelor of Science in Forestry, and in Wildlife and Fisheries Science, the minimum requirement is 198 quarter-hour credits. For the degree of Bachelor of Science in Agricultural Engineering, the minimum requirement is 198 quarter-hour credits.

Students must complete at least 25 percent of their degree program at UTK.

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 unnecessary 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, must be 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 in Agricultural Extension Education and in other departments in the College of Agriculture.

Additional information and a five-year course 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
- Agricultural Engineering
- Plant and Soil Science

General requirements and policies of the Graduate School of the University of Tennessee relating to admission 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 campus in the University. On the agricultural campus are found the main agricultural building, Morgan Hall; the Agricultural Engineering Building; McCoy Hall; the Dairy Products Building; McLeod Food Technology Building; C.F. Breshears Animal Sciences Building, which includes a large pavilion; Ellington Hall which houses the plant science departments; and greenhouses for teaching and experimental work. Buildings have been erected recently provide facilities comparable to the best in the country for the departments which they serve.

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 land) 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 main University campus so that students may make the change between classes without serious 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 when they register as freshmen. An advisor from the department will be assigned for their counseling. It is not necessary, however, that all freshmen students select their curriculum until the end of the first year. Those who are in doubt will be assigned a special advisor to assist them in exploring the opportunities in the several fields of agriculture and in guiding them in the planning of appropriate courses for study for the freshman year. When they choose a curriculum, an advisor will be assigned from that department.

Students with special interest in science, business, or production technology should consult the advisor about selection of appropriate electives. A foundation for advanced study in the major field of study must 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, leading to a position for employment with the Agricultural Extension Service. For this purpose, both the major-curriculum advisor and the agricultural-extension advisor 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 small group should be consulted, the Dean of the College of Agriculture should be informed, and each advisor should maintain a complete record of the student’s progress.

Students who transfer to the College of Agriculture from another institution or from another college with The University of Tennessee, should consult the Dean in doubt as to the curriculum they wish to follow, and for assignment to an appropriate advisor. Requests for substitutions or special examinations should be submitted for consideration during the first quarter of study in the selected curriculum.

BASIC CURRICULUM FOR AGRICULTURE

All students working for a degree of Bachelor of Science in Agriculture will include in their curriculum the following minimum requirements. The sequence and the selection of courses not specified will be guided by the advisor.

<table>
<thead>
<tr>
<th>Hours</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture 1110, Introduction to Social Sciences for Agriculture</td>
<td>4</td>
</tr>
<tr>
<td>Agriculture 1120, Introduction to Agricultural Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Agriculture 1140, Plant Science for Agriculture</td>
<td>4</td>
</tr>
<tr>
<td>Agriculture 1150, Food Technology and Science for Agriculture</td>
<td>4</td>
</tr>
<tr>
<td>Agricultural Science, (courses listed in department curricula)</td>
<td>26</td>
</tr>
<tr>
<td>English and Communications, (*English 1510-20, Speech 2311, and elective 6 hours—literature or communications)</td>
<td>18</td>
</tr>
<tr>
<td>*Mathematics 1540-50-60, (general mathematics)</td>
<td>12</td>
</tr>
<tr>
<td>Biological Science, (biology, botany, microbiology, or zoology)</td>
<td>12</td>
</tr>
<tr>
<td>*Physical Science, (Chemistry 1110-20-30 and Physics 1110-20 or 2110-20 and Electives 12 hours—not more than 3 areas)</td>
<td>16</td>
</tr>
<tr>
<td>Social Science and Humanities, (Economics 2110-20 and Electives 12 hours—not more than 3 areas)</td>
<td>18</td>
</tr>
<tr>
<td>Other Courses or Elective Hours Specified by Departments</td>
<td>76</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>198</td>
</tr>
</tbody>
</table>

*Equivalent honors course.

The five basic courses in agriculture are not departmental; but the course outlines 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 the material in each course. The five courses are required of all agricultural students who seek the degree of Bachelor of Science in Agriculture, and the five teaching teams coordinate their work carefully to assure 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 fields, and its relation to other areas of study. Basic subject-matter concepts are presented to prepare suitable foundations for further study. These courses serve as a 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 19 hours per quarter must have the approval of the Dean of the College.

**Agricultural Biology**

Advisor: Professor Southard

No undergraduate curriculum exists in agricultural biology, but a program leading to the Master of Science degree with a major in agricultural biology 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 comprised 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 these 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.

**Agricultural Economics and Rural Sociology**

AGRICULTURAL BUSINESS CURRICULUM

Adviser: Professor Martin, Associate Professor Brooker, Mundy, Snell, and Trevina.

This curriculum is designed to prepare students for employment in the rapidly expanding field of agricultural business. 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 businesses, 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.
### Institute of Agriculture

#### Freshman

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Credit</th>
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</thead>
<tbody>
<tr>
<td>Agriculture 1110-20-30-40-50</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>English 1510-20</td>
<td>8</td>
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<tr>
<td>Mathematics 1540-50-60</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Biological Science Electives</td>
<td>8</td>
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</tr>
</tbody>
</table>

#### Sophomore

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<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Credit</th>
</tr>
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<tbody>
<tr>
<td>Chemistry 1110-20-30 or 1510-20-30 and 4 hours geology or physics</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Biology Elective</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Mathematics 2110-20-30</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Biological Science Elective</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

### Junior

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Economics Electives</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Rural Sociology Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Speech 2311</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Finance 3110</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Statistics 2100, 3220 and 4230</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Economics 3110-20</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Nondepartmental Agricultural Electives</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Vocational Electives</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

#### Senior

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Economics and Rural Sociology Electives</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Economics Elective</td>
<td>4 or 3</td>
<td></td>
</tr>
<tr>
<td>Speech 3021 or Communications Elective</td>
<td>4 or 3</td>
<td></td>
</tr>
<tr>
<td>Nondepartmental Agricultural Electives</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Vocational Electives</td>
<td>23 or 24</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL: 198 hours**

- Or equivalent honors courses.

### Agricultural Education

Advisers: Professor Wiegens and Associate Professors Craig and 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 education 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 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.

### Agricultural Engineering

#### AGRICULTURAL ENGINEERING CURRICULUM

Advisers: Professors Luttrel and Sewell

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 Engineers' Council for Professional Development. 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 in 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: agricultural power and machinery; agricultural structures and environment; electric power and processing; soil and water conservation engineering; 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 also eligible for selection into 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.
**Agricultural Mechanization Curriculum**

Advisers: Professors Luttrell and Shelton

The agricultural mechanization curriculum is administered by the Department of Agricultural Engineering and leads to the degree of Bachelor of Science in Agriculture. The curriculum prepares students to apply principles, techniques and systems of engineering, agricultural science and business to the broad industry of agriculture.

Agricultural mechanization courses encompass power and machinery, electrification and processing, structures and environment, and soil and water conservation. By selecting either the Production and Processing Option or the Business and Industry Option, students, with assistance from their advisor, may structure their program to obtain either a broad or a highly specialized education.

Graduates are employed by 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**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Credit</th>
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<tbody>
<tr>
<td>Agricultural Engineering 1130</td>
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<tr>
<td>Basic Food Technology 120-20-30</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Basic Engineering 1410</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Chemistry 1110-20-30</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>English 1510-20</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td><em>Math 1840-50-60</em></td>
<td>12</td>
<td></td>
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**Sophomore**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</tr>
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<tbody>
<tr>
<td>Agricultural 1130-40</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Biology 1210-20 or 3110-20</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Engineering Science and Mechanization 3311</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>English Communications Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Graphics 1310-20-30</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td><em>Math 2840-50-60</em></td>
<td>12</td>
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</tr>
<tr>
<td>Physics 2310-20-30</td>
<td>9</td>
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**Junior**

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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Agricultural Engineering 3100</td>
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<tr>
<td>Agricultural Engineering 3610-20-30</td>
<td>12</td>
<td></td>
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<tr>
<td>Electrical Engineering 2010-20 or 3110-20</td>
<td>6</td>
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<tr>
<td>Engineering Sci. and Mechanics 3101</td>
<td>3</td>
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<tr>
<td>Engineering Sci. and Mechanics 3210 or 3320</td>
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<td></td>
</tr>
<tr>
<td>Engineering Sci. and Mechanics 3510 or 3530</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Civil Eng. 3710</td>
<td>3</td>
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<tr>
<td>Computer Science 3150</td>
<td>3</td>
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<tr>
<td>Mechanical Engineering 3311, 3510</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Speech 2311</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Plant and Soil Science 2130</td>
<td>4</td>
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<tr>
<td><em>Humanities-Social Science Elective</em></td>
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**Senior**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economics 2110</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Agricultural Engineering Elective</td>
<td>4</td>
<td></td>
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<tr>
<td>Agricultural Engineering 4120-30</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Electrical Engineering 2030 or 3130 or 3315</td>
<td>3</td>
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<tr>
<td><em>Humanities-Social Science Electives</em></td>
<td>15</td>
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<tr>
<td><em>Technical Electives</em></td>
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<tr>
<td>Electives</td>
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</tbody>
</table>

**Total: 198 hours**

*Or equivalent honors course.

*Students with less than 28 ACT math score must take Math 1500 prior to 1840-50-60.

*Agricultural Engineering elective group; any two of Agricultural Engineering 4610, 4620, 4630, 4640.

*Humanities-Social Science Electives from such fields as history, economics, government, literature, sociology, psychology, or fine arts (not more than three areas).

*The selection of technical electives must have approval of students advisor and the department head prior to registration in the course.

**Agricultural Extension Education**

Advisers: Professor Dotson and Associate Professor 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 courses.

Graduate majors and minor programs 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 Johnson, Bitter, Chamberlain, McLaren, Merriman, Montgomery, Murphree, Richardson, Shirley, Shrode, Swanson; Associate Professors Barth, Lidwall, and Assistant Professors Conrick, Hitchcock, Holloway, Masinu and Smolling.

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 animals, milk, egg or poultry production, managerial or marketing groups, other educational agencies, supply and equipment cooperatives, agricultural extension service, agricultural communication, public relations, and various organizations associated with agriculture.

Students have the opportunity, through course selection, to procure the equivalent of double majors in animal science with vocational education, plant and soil science, agricultural economics, or other available departments.

**Freshman Hours Credit**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural 1110, 1130, 1140</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Biology 1210-20</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td><em>Chemistry 1110, 1120, or 1510-20</em></td>
<td>8</td>
<td></td>
</tr>
<tr>
<td><em>Mathematics 1450-50-60 or 1840-50-60</em></td>
<td>12</td>
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</tbody>
</table>

**Food Technology and Science 3020**

**Food Technology and Science 3840**

**Food Technology and Science 4410**

**Forestry 2610**

**Forestry 3300**

**Plant and Soil Science 3110**

**Plant and Soil Science 3510**

**Plant and Soil Science 3520**

**Ornamental Horticulture 3010**

**Ornamental Horticulture 3020**
Sophomore

Hours Credit

Agriculture 1120, 1150 .................................................. 8
Animal Science 2810 .................................................... 3
1Chemistry 1130 or 1530, and 3211-19 or
2230, or Nutrition 3310 .............................................. 8
Economics 2110-20 .................................................... 6
Microbiology 2010 ....................................................... 4
Plant and Soil Science 2130 ......................................... 4
Physics Elective ......................................................... 4
Speech 2311 and
Communications Elective ........................................ 7
Electives ..................................................................... 6

Junior

Non-Animal Science Agricultural
Electives ..................................................................... 6
Animal Science (Core required: Animal Science 3210, 3220, 3320, 3330, 3410,
3420, 3510) .............................................................. 23
Directed Electives - Evaluation .................................. 3
Communications Elective ........................................... 3
Electives ..................................................................... 9
Humanities-Social Science Electives ......................... 6

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, in 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 CURRICULUM

Advisers: Professors Merriman, Blumenthal, Chamberlain, McLaren, Montgomery, Murphee, Richardson, Shirley, Shrode; Associate Professors Barth, Lidvall, Assistant Professors Cornick, Hitchcock, Holloway, Masinuop, 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 College of Veterinary Medicine. However, each year the number of available spaces. Therefore, meeting or surpassing the minimum requirement does not assure acceptance by the Veterinary College. Therefore, 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 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 120 hours. Students 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 interested student plan to pursue at least a three-year pre-veterinary program. Inquiries concerning possible course substitutions and the combining of the pre-veterinary program with a degree program should be directed to the department-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. See the College of Veterinary Medicine for additional information.

A suggested schedule for the Pre-Veterinary Medicine—Animal Science student is given below which will 1) 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 completing the requirements for a degree in agriculture with a major in animal science. It is strongly recommended that the student carry a normal load of at least 16 to 18 hours per quarter.

First Year

Hours Credit

English 1510 .................................................................. 8
Mathematics 1540, 1550, 1560 ........................................ 12
Biology 1210-20-30 ................................................... 12
Chemistry 1110-20-30 ............................................... 12
Agriculture 1130 .......................................................... 4
Humanities electives .................................................... 4

TOTAL: 52

Second Year

Chemistry 3211-21-31 .................................................. 9
Chemistry 3219-29-39 .................................................. 3
Physics 2210-20-30 ..................................................... 12
Agriculture 1110 .......................................................... 4
Economics 2110 ........................................................... 4
Speech 2311 .................................................................. 3
Animal Science 3410, 2810, 3320 and
3330 .................................................................... 12
Humane electives ....................................................... 4

TOTAL: 51

Third Year

Hours Credit

Biochemistry 4110-20 ................................................... 8
Microbiology 2610 ....................................................... 3
Economics 2120 ........................................................... 4
Social Science electives .............................................. 2
Humanities electives .................................................... 4
1Animal Science electives ........................................... 10
2Electives ................................................................... 20

TOTAL: 52

1Students with a strong math background may omit Math 1540 and start with 1550 or elect to take the 1840-50-50 series
2A recommended elective for students with limited or no practical animal experience and required for those attempting to obtain the B.S. in Agriculture with a major in animal science in both the regular program and for those accepted to UT College of Veterinary Medicine after 3 years and who wish to obtain the B.S. in Agriculture with a major in animal science after completion of the first year in the College of Veterinary Medicine (see below).
3It is recommended that the student include AS 3420, one 3000 level evaluation course and one management course.
4For the student accepted at the end of the third year of pre-veterinary medicine and desiring to receive a B.S. in Agriculture with a major in animal science upon successful completion of the first year in the University of Tennessee College of Veterinary Medicine, the following are required: Agriculture 1150 or equivalent food technology and science course, Plant and Soil Science 2130, other agriculture outside of animal science 6 hrs. (suggested Agricultural Mechanization 4160, Food Technology and Science 3840, Agricultural Biology 2310, Plant and Soil Science 3140).
5Students wanting to complete pre-vet requirements, but wishing to major in a department other than animal science, should consult with the appropriate departmental adviser for a proper selection of electives.

ANIMAL SCIENCE CURRICULUM WITH
A PRE-VET OPTION

This program is designed for students accepted by The U.T. College of Veterinary Medicine after the third year who wish to obtain a B.S. in Agriculture with a major in animal science upon completion of the first year in the College of Veterinary Medicine.

The student will need to complete the requirements as established by the College of Veterinary Medicine. In addition, the student will need to complete the following courses in the College of Agriculture AG 1110 or equivalent AG Econ. course; AG 1150 or equivalent FT & S course; AS 2810, 3420, one 3000 level evaluation course, and one 4-hour management course; P & O 2110; agriculture other than AS, 8 hours. In addition, the following general requirements must be met in order to meet certain rules of UTK and the College of Agriculture in granting degrees:
1. The last 45 hours of the three-year program must be taken at UTK.
2. At least 18 hours of upper division technical agriculture must be taken at UTK.
3. The student must complete the first year in the U.T. College of Veterinary Medicine and with the substitution of appropriate courses from the first year and the completion of a minimum of 198 hours will be granted a B.S. in Agriculture with a major in animal science. It is the student's responsibility to complete the above requirements and to initiate the request for the degree.
Food Technology and Science

Advisers: Professors Miles and Overcast, Associate Professors Collins and Melton.

Food technology and science is the application of the sciences and engineering to the manufacture, preservation, storage, transportation, 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, young 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, packaging 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 opportunities for practical training in food processing plants and laboratories or federal and state laboratories.

Freshman
- Agriculture 1110-30-40-50
- English 1510-20
- Mathematics 1540-50-60
- Physics 1210-20-30
- Social Science Elective

Sophomore
- Agriculture 1120
- Chemistry 1110-20-30 or 1510-20-30
- Economics 2110-20-30
- Food Technology and Science 2110-20
- Microbiology 2610
- Speech 2311
- Communications or English Elective
- Social Science Elective

Junior
- Agricultural Mechanization 3510
- Chemistry 2230 or Nutrition 3310, Nutrition 3220-30-39
- Food Technology and Science 3210-20
- Food Technology and Science 4210
- Microbiology 3810
- Plant and Soil Science 3610
- Communications or English Elective
- Social Science Elective
- Electives

Senior
- Food Technology and Science 4010
- Food Technology and Science 4110-20, 4310, 4510, 4920
- Food Science 4010
- Nutrition 3410
- Electives

TOTAL: 198 hours

FOREST RESOURCE MANAGEMENT CURRICULUM

Freshman
- Botany 1110-20 or Biology 1210-20
- English 1510-20
- Forestry 1620
- Mathematics 1540-50-60
- Physics 1210-20
- Speech 2311
- Electives

Sophomore
- Chemistry 1510-20-30
- Computer Science 1410
- Economics 2110-20-30
- Forestry 3020-40-50
- Plant and Soil Science 3310, 3410
- Electives

Senior
- Agricultural Biology 3210
- Forestry 3130, 3210
- Forestry 4210-20-30, 4330, 3240
- Electives

TOTAL: 198 hours

* Biology 1210-20 is recommended in lieu of botany for students interested in wildlife management.
* 1 or equivalent honors courses.
* Enough electives must be taken to total 198 hours including a minimum of 6 hours of communications electives selected from a Department of Forestry approved list and a minimum of 11 hours of social science and/or humanities, not more than three areas and Agriculture 1110 is recommended.
* Computer Science 1510 is accepted in lieu of 1410 for those wishing to elect additional courses in this area.

FOREST RECREATION OPTION

The Forest Recreation Option provides students with opportunities to obtain an education in preparation for professional positions in the planning, development, interpretation, and management of private and public forested lands for recreational purposes. Students are also exposed to the basic philosophy and principles associated with leisure time and its use, and the relationship of forest resources to the constructive utilization of leisure time.

Freshman
- Botany 1110-20 or Biology 1210-20
- English 1510-20
- Forestry 1620
- Mathematics 1540-50-60
- Physics 1210-20
- Speech 2311
- Electives

* Or equivalent honors courses.

1 Mathematics 1840-50-60 are desirable alternatives for students with suitable entrance scores.
2 Those students preparing for employment in commercial food industry should select business electives from such areas as agricultural economics, accounting, business law, industrial management, and marketing. Student should consult with adviser before taking any elective.
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.

Landscaping means modifying the outdoor environment to 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 nurserymen, landscape maintenance, garden center operation, allied sales, highway landscaping, park development, research, teaching, and writing.

Freshman Hours Credit

**Agriculture 1110-20** 30-40-50 12
1 Introductory Biological Sciences 12
2 English 1510-20 8
3 Mathematics 1540-50-60 12

Sophomore

1 Chemistry 1110-20 or 1510-20 12
2 Economics 2110-20 6
3 Biology 3130 6
4 Forestry 3040 4
5 Plant and Soil Science 2130 3
6 Plant and Soil Science 3130 7
7 Animal Science 3120 3
8 Computer Science 1410 3
9 Electives 11

Junior

1 Zoology 3600, 4240 8
2 Wildlife and Fisheries Science 3230 3
3 Forestry 3110, 3320 7
4 Plant and Soil Science 3130 3
5 Botany 3030 4
6 Agricultural Mechanization 3210 3
7 Electives 21

Senior

1 Zoology 4200, 4660 9
2 Wildlife and Fisheries Science 4450, 4660 8
3 Wildlife and Fisheries Science 4510, 4520 8
4 Forestry 4210 3
5 Electives 22

**TOTAL: 198 Hours**

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 interest 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 whom they serve; scholarly application of scientific information and methods to these goals; ecological perspective; and execution of programs to maintain past successes, to prevent repetition of past failures, and to prepare for future needs.

Upon completion of the four-year wildlife and fisheries science curriculum, the degree of Bachelor of Science in Wildlife and Fisheries Science is awarded.

Freshman Hours Credit

**Biological 1210-20** 12
1 Mathematics 1540-50-60 12
2 English 1510-20 8
3 Speech 2311 4
4 Forestry 1620 3
5 Physics 1210 4
6 Electives 6

**TOTAL: 198 Hours**

Or equivalent honors courses.

Or sixty hours of electives, approved by the faculty advisor, to include 6 hours of communications electives with Journalism 2210, 3110 highly recommended, 12 hours of social science or humanities and 20 hours of electives taken from the following: Ap Biology 3210; Animal Science 3220, 3230, 3130, 3130, 3120, Botany 4310; Forestry 4430, 4440; Physics 1230; Zoology 3040, 3050, 3150, 4290, 4300, 4670, 4720-29.

Computer Science 1510 is accepted in lieu of 1410 for those wishing to elect additional courses in this area.

Or equivalent honors courses.

**TOTAL: 198 Hours**

Or equivalent honors courses.

Or sixty hours of electives, approved by the faculty advisor, to include 6 hours of communications electives with Journalism 2210, 3110 highly recommended, 12 hours of social science or humanities and 20 hours of electives taken from the following: Ap Biology 3210; Animal Science 3220, 3230, 3130, 3120, Botany 4310; Forestry 4430, 4440; Physics 1230; Zoology 3040, 3050, 3150, 4290, 4300, 4670, 4720-29.

**Or equivalent honors courses.**

**Or equivalent physiology course.**

**Or equivalent psychology course.**

**Or equivalent biology course.**

**Or equivalent course.**
Plant and Soil Science
Advisers: Professors Seatz, Skold and Swingle; Associate Professors Coffey, Reynolds and Smith; Assistant Professor Lessman.
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 yields of high quality products; and weed control for efficient crop production. Soil science includes studies in soil formation and classification for a better understanding of our soil resources; soil management for optimum crop production and 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 skills. The scientist 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 differ depending 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 the solution of practical problems, positions are available with the Agricultural Extension Service as extension agents or as specialists, with the Soil Conservation Service, 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 salesmen. Banks and other financial institutions employ plant and soil scientists as appraisers and farm managers. Others may farm on their own, 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.

Each student selecting this major must complete the basic curriculum for agriculture and fulfill the major group requirements. The curriculum in plant and soil science 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>
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</thead>
<tbody>
<tr>
<td>Agriculture 1100-30-40-50</td>
<td>16</td>
</tr>
<tr>
<td>Lower Division Biological Sciences</td>
<td>12</td>
</tr>
<tr>
<td>English 1510-20</td>
<td>8</td>
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<tr>
<td>Mathematics 1540-50-60</td>
<td>12</td>
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<table>
<thead>
<tr>
<th>Sophomore</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry 1110-20-30 or 1510-20-30</td>
<td>12</td>
</tr>
<tr>
<td>Economics 2110-20</td>
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<tr>
<td>Agriculture 1120</td>
<td>4</td>
</tr>
<tr>
<td>Plant and Soil Science 2100</td>
<td>4</td>
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<tr>
<td>Speech 2311</td>
<td>4</td>
</tr>
<tr>
<td>Physics 1210 or 2210</td>
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</tr>
<tr>
<td>English and Communications Electives</td>
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</tr>
<tr>
<td>Social Science or Humanities Electives</td>
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<table>
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<tr>
<th>Junior</th>
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<tbody>
<tr>
<td>Social Science or Humanities Electives</td>
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<tr>
<td>Biological or Physical Science Electives</td>
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<tr>
<td>Agricultural Biology 310 or 3210</td>
<td>4</td>
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<tr>
<td>or 4010</td>
<td>4</td>
</tr>
<tr>
<td>Chemistry 2230 or 3211-19</td>
<td>4</td>
</tr>
<tr>
<td>or Nutrition 3310</td>
<td>4</td>
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<tr>
<td>Animal Science 3320 or 3330</td>
<td>6</td>
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<tr>
<td>Plant and Soil Science 3020 or 3040</td>
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<td>and Plant Science Electives</td>
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<tr>
<td>Nondepartmental Agricultural Electives</td>
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<td>Electives</td>
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<table>
<thead>
<tr>
<th>Senior</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botany 3210</td>
<td>4</td>
</tr>
<tr>
<td>Plant and Soil Science 4910</td>
<td>1</td>
</tr>
<tr>
<td>Plant and Soil Science Electives</td>
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</tr>
<tr>
<td>Electives</td>
<td>35</td>
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</tbody>
</table>

TOTAL: 198 Hours

*Or equivalent honors courses.
*Mathematics 1840-50-60 are suggested for students with high mathematics scores.
*Student should consult with departmental adviser for suggested courses.
*Only courses taught outside the College of Agriculture will fulfill this requirement.
*Plant and soil science electives must include at least three courses from Group A and three from Group B listed below. Plant and Soil Science 3610 can be counted in only one of the groups.

GROUP A
- Plant and Soil Science 3110, 3220, 3610, 4110, 4230, 4320

GROUP B
- Plant and Soil Science 3120, 3140, 3160, 3180, 3510, 3520, 3610, 3710, 4120

In addition to the specific courses, students can specialize in areas of their interest by selecting courses from the following groups. These lists are suggestive only. The departmental adviser will guide the student according to the student's individual objective.

**Agriculture**
- Agricultural Economics 4120, 4140, 4330
- Agricultural Mechanization 3210, 4210
- Animal Science 3410, 3510, 2810
- Food Technology and Science 3840
- Rural Sociology 3420

**Business**
- Accounting 2110-20; Business Law 4110-20-30
- Economics 2130: Finance 3110: Industrial Management 3010: Marketing 3110-20; Office Administration 4310-20

**Science**
- Biology 3110-20-30; Botany 3030, 4310
- Chemistry 2140-49, 3211-21-31, 3219-29-39; Geology 1510-20; Physics 1220-30

**Credit for Cooperative Work**
A maximum of nine quarter hours 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 twelve weeks. At least one quarter must be spent in study on the campus between periods of employment. Prerequisites: Junior classification, with quality grade average of 2.2 or above, and permission of the department head and the Dean of the College of Agriculture to register. Three hours credit, 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 Elliott Soil and Plant Science 310 or 3300. 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. They 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 attend and inspect each department of the College.

**Departments of Instruction**
Numbers in parentheses following the course titles indicate quarter hours credit offered.

**Interdepartmental Offerings**

**Agriculture (028)**

*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. 3 hrs and 2 labs.

*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.

*4110 Agricultural Industry Field Seminar (3) A travel study of the agricultural industry involving agricultural production, processing, marketing and services, and their interrelationships. Written report required. Prereq: Junior standing and permission of instructor.
Departmental Programs

Agricultural Biology (037)

Professors: L.F. Johnson, Ph.D. Louisiana State; C.J. Southworth (Head), Ph.D. North Carolina State; J.W. Hilly, Ph.D. Ohio State.

Associate Professors: C.D. Pless, Ph.D. Clemson; H.E. Reed, Ph.D. Ohio State; J.L. Wilson, Ph.D. Tennessee.


3110 Introductory Plant Pathology (4) Principles of plant pathology illustrated by diseases of common agricultural crop plants. Prereq: Botany 1120 or Botiology 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. Prereq: 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 pests of crops, gardens, orchard, and household. 3 hrs and 1 lab.

3220 Apiculture (3) Biology of the honey bee, with emphasis on beekeeping equipment and apiary management practices relative to pollination of crops and production of honey and beeswax. 2 hrs and 1 lab.

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. Prereq: 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. Prereq: 2210 or equivalent. 2 hrs and 1 lab.

GRADUATE

5000 Thesis

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

5210 Plant Parasitic Nematodes (4)

5220 Plant Disease Control (3)

5230 Field Crop and Vegetable Insects (3)

5240 Insect Pests of Man and Animal (3)

5260 Insect Pest Management (4)

5310 Special Problems in Plant Pathology or Economic Entomology (1-6)

5410 Seminar (1)

Agricultural Economics and Rural Sociology

Professors: J.A. Martin (Head), Ph.D. Minnesota; M.B. Badenhop, Ph.D. Purdue; D.W. Brown, Ph.D. Iowa State; C.L. Cleland, Ph.D. Wisconsin; Irving Dubov, Ph.D. California (Berkeley); L.H. Keller, Ph.D. Kentucky; F.O. Leuthold, Ph.D. Wisconsin; W.P. Haney (Emeritus), Ph.D. Minnesota; T.J. Whittley, Ph.D. Purdue.

Associate Professors: J.R. Brooker, Ph.D. Florida; C.M. Cuskaden, Ph.D. Michigan State; B.J. Deaton, Ph.D. Wisconsin; T.H. Klinck, Ph.D. Kentucky; B.R. McManus, Ph.D. Purdue; D.D. Mundy, Ph.D. Tennessee; B.H. Pentecost, J.D. Tennessee; C.B. Sappington, Ph.D. Illinois; J.G. Snell, Ph.D. Michigan State; B.J. Trevenal, Ph.D. Tennessee.

Assistant Professor: R.H. Orr, Ph.D. Illinois.

Distinguished Professor

Agricultural Economics (047)

3120 Agricultural Prices (3) Factors determining prices of farm products. Effects on price of varying degrees of demand, competition, and scarcity. Sources of information on prices and related market data. Uses of price information and techniques of analysis in determining outlook for farm prices. Prereq: Agriculture 1110 and Economics 2120.

3320 Marketing Farm Products (3) American marketing system; alternative market structures, functions of marketing system, commodity marketing agencies, current marketing problems and possibilities for improvement. Prereq: Agriculture 1110 and Economics 2120.

3410 Farm Business Analysis (3) Techniques of analyzing a farm business. Factors affecting farm income and efficiency. Resource acquisition, cash flow, risk, tax, and tenure consideration. Practice in decision making on simulated farm. Prereq: Agriculture 1110 and Economics 2120. 2 hrs and 1 lab.

3510 Commodity Futures Markets (3) Futures market as an instrument in marketing of primary industry products; process of placing orders to the risk of adverse price change; price analysis from two viewpoint: supply-demand and history (fundamental and chartist). Prereq: Junior standing. 3 hr.

3710 Consumer Demand for Agricultural Products (3) Economic principles, practices and budgeting techniques to use in purchasing of goods and services. Evaluation of advertising and related information. Prereq: Agriculture 1110 and Economics 2120.

4120 Farm Management (3) Principles of farm organization and operation, allocating land, labor, and capital to meet changing technologies; tenure arrangements and use of credit; risks; measures of success. Use of principles of accounting and bookkeeping in planning farms. Field trips arranged. Prereq: Agriculture 1110 and Economics 2120. 2 hrs and 1 lab.

4140 Introduction to Agricultural Production Economics (3) Resource allocation, product selection, scale of operation of agricultural firms; aggregate effects of decisions made by individual agricultural firms. Prereq: Agriculture 1110 and Economics 2120, and senior standing.

4210 Problems in Agricultural Economics (3) Supervised laboratory course in methods of collecting and analyzing information and in writing a report. Prereq: Agriculture 1110 and Economics 2120. May be repeated to a maximum of 9 hours credit.

4240 World Agriculture and Trade (3) Economic bases of world agricultural production and trade: resource location, land tenure systems, international trade and commercial policy. Prereq: Agriculture 1110 and Economics 2120, or consent of instructor.

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

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

4320 Agricultural Policies (3) Meaning of agricultural policy in democratic society: relationship of farm groups to public policy; problems arising from public policy; types of agricultural policy and appraisal of results; current problems of reforms. Prereq: Agriculture 1110 and Economics 2120.

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

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


4710 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.

GRADUATE

5000 Thesis

5002 Non-Thesis Graduation Completion (3)

5011 Special Problems in Lieu of Thesis (3)

5120 Agricultural Price Analysis (3)

5130 Advanced Agricultural Production Economics (3)

5210 Seminar: Agricultural Policies (3)

5220 Seminar: Methodology of Research (3)

5230 Seminar: Adjustments to Industrialization (3)

5310 Research (3)

5410 Agricultural Marketing Analysis (3)

5420 Advanced Land Economics (3)

5440 Economics of Agricultural Development (3)

5610 Quantitative Methods in Agricultural Economics (3)

5710 Quantitative Methods in Agricultural Economics (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)

3420 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.

GRADUATE

5340 Special Problems (3)

5430 Rural Sociology Seminar (3)

5450 Advanced Rural Sociology (3)

5470 Research Problems in Rural Communities (3)

5490 Rural Population Analysis (3)
Agricultural Engineering

4630 Design of Processing and Materials Handling Systems (3) Development of systems and components for integrated agricultural processing considering mass and energy balances, product characteristics, equipment specifications, storage, handling and economic merit. Prereq: 3630. 1 hr and 2 labs.

4640 Design of Agricultural Machinery (3) Functional requirements of agricultural machinery. Elements of machine component design; synthesis of mechanisms, mechanical and hydraulic drives. Team effort in completing machine design project. Prereq: 3640 or permission of instructor. 1 hr and 2 labs.

GRADUATE

5000 Thesis

5240 Environmental Control in Agricultural Structures (3)

5340 Hydrology of Agricultural and Forest Lands (3)

5440 Instrumentation in Agricultural Systems (3)

5540 Engineering Properties of Agricultural Materials and Products (3)

5640 Research Problems in Agricultural Engineering (3)

5710-20 Similitude in Design and Research (3, 3)

6000 Doctoral Research and Dissertation

6110 Seminar (1)

6310 Engineering Systems Analysis in Agriculture (3)

6610 Selected Topics in Agricultural Engineering (3)

Agricultural Mechanization (080)

2110 Agricultural Drawing and Mapping (3) Fundamentals of graphics and mapping, with emphasis on applications in agriculture and forestry. 1 hr and 2 labs.

2130 Agricultural Surveying (3) Measurement of horizontal distances and angles; differential and profile leveling; topographic surveying and mapping; area computation. Prereq: Math 1560 or permission of instructor. 1 hr and 2 labs.

2140 Forest Surveying (2) Instruments, methods, and computations used in determining distances, angles, elevations, and area related to forest management problems. Credit cannot be given for both 2130 and 2140. Prereq: Math 1560. 1 hr and 1 lab.

3100 Seminar (1) Presentations, discussions, reports on research techniques. Prereq: Permission of department head.

3110 Agricultural Mechanics (3) Organizing equipment, and managing and teaching farm and shop jobs; techniques, materials, and procedures in design and construction of shop projects; metal work and welding. 1 hr and 2 labs.

3140 Forest Surveying and Mapping (3) Use of low-precision methods and instruments including pacing, Abney level, topographic trailer tape, 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 six hours per period.

3210 Soil and Water Conservation Facilities (3) Leveling, topographic surveying; planning, construction, maintenance, and erosion-control systems. Prereq: Math 1550. 2 hrs and 1 lab.

3220 Agricultural Structures (3) Functional planning of structures; environmental control, construction methods, properties of building materials, and cost estimation. Prereq: Math 1550. 2 hrs and 1 lab.

3510 Agricultural Utilities and Processing Equipment (4) Equipment and control, water systems, heating and refrigerating systems; waste disposal systems. Prereq: Agr. 1120; Physics 1220. 3 hrs and 1 lab.

3560 Electrical Systems in Agriculture (3) Electrical terms and fundamentals, distribution, wiring practices, governing codes, controls and motors used in agricultural and residential facilities. Prereq: Physics 1220 or Agriculture 1120. 2 hrs and 1 lab.

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

4150 Agricultural Waste Utilization and Disposal (3) Techniques, equipment, and structures for utilizing, treating, and disposing of agricultural wastes by land spreading, lagooning, 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 nine hours credit when engaged in approved industry work. Prereq: 3100 and permission of department head.

4290 Forest Utilities and Roads (4) Electrical service and equipment, power sources, water supply, and sanitation systems emphasizing forest recreation facilities. Planning, construction, and maintenance of forest access roads, culverts, and timber bridges. Prereq: 2130 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)

Agricultural Extension Education (075)

5000 Thesis

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

5100 Special Problems in Agricultural Extension (1-6)

5210 Long-Range Extension Program Planning (3)

5220 Seminar (3)
improvement programs; tack, equipment and facilities for both pleasure owners and commercial producers. Alternatives evaluated in terms of pleasure, recreation and economic returns. Prereq: Completion of animal science sophomore and junior core courses or permission of instructor. 2 hrs and 1 lab.

4860 Lamb and Wool Production and Management (3) 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. Prereq: Completion of animal science sophomore and junior core courses or permission of instructor. 2 hrs and 1 lab.

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

GRADUATE

5000 Thesis

5011 Problems in Lieus of Thesis (1-6)

5110 Special Problems in Animal Science (1-6)

5210 Endocrine Relations in Animal Production (4)

5230 Advances in Mammalian Reproduction (3)

5240 Advanced Studies of the Secretion of Milk (3)

5311 Analytical Techniques in Animal Nutrition (3)

5321 Energy in Animal Nutrition (4)

5331 Proteins in Animal Nutrition (3)

5341 Vitamins and Minerals in Animal Nutrition (3)

5410 Genetics of Animal Populations (3)

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

6150 Topics in Milk Constituents (3)

6160 Topics in Dairy Microbiology (3)

6211 Advanced Topics in Animal Physiology (1-6)

6220 Environmental Physiology of Farm Animals (3)

6230 Animal Growth and Development (3)

6311 Advanced Topics in Animal Nutrition (1-6)

6411 Advanced Topics in Animal Breeding (1-6)

6420 Animal Breeding Research Methods and Interpretation (3)

6811 Advanced Topics in Animal Products (1-6)

6910 Seminar (1)

Food Technology and Science (390)

Professors: J.T. Miles (Head), Ph.D. Wisconsin; T.B. Harrison (Emeritus), M.S.A. Tennesee; W.W. Overcast, Ph.D. Iowa State.

Associate Professors: J.L. Collins, Ph.D. Maryland; B.J. Demott, Ph.D. Michigan State; H.O. Haynes, Ph.D. Illinois; C.G. Melton, Ph.D. Kansas State.

Assistant Professors: S.L. Melton, Ph.D. Tennessee; M.J. Rieman, Ph.D. Kansas State.

2110 Food Regulations and Standards (3) Federal and state laws regulating food industry. Quality grades and standards and methods of evaluating processed foods. 2 hrs and 1 lab.

2120 Food Manufacturing (4) Preparation of raw materials; grinding, slicing, cutting, mixing, processing, drying, marinating, braising, baking, frying, grilling, roasting, smoking, salting, nailing, herbating, freezing, defrosting, wrapping, packaging, preventing, heating, cooling, chilling, freezing, thawing, drying, pasteurization, beginning. Prereq: 1890, 1895, 2100. 4 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.

3210 Food Composition (3) Determination and study of major constituents of fresh and processed foods with attention to changes and interactions occurring during processing and storage. Prereqs: Chemistry 1120 or 1520 or 1620. 2 hrs and 1 lab.

3220 Food Preservation (4) Survey of food industry and preservation methods for prevention of deterioration of food. Prereq: Microbiology 2610. 3 hrs and 1 lab.

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 of 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 farm 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 for a maximum of 9 hours credit. Prereq: Permission of department head.

4010 Food Technology and Science Seminar (1-3) Review of literature; oral and written reports. May be repeated for a maximum of 3 hours credit. Prereq: Junior standing and permission of instructor.

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

4050 Advanced Food Composition (3) Intensive study of food constituents and changes affected by processing and storage. Prereqs: 310 and Nutrition 3320 or equivalent. 2 hrs and 1 lab.

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

4120 Food Quality Assurance (3) Systems for quality assurance in food industries. Various methods including statistics used by food industries to assure desired quality of food products. Prereq: Junior standing and 3 hrs statistics. 2 hrs and 1 lab.

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

4310 Food Packaging (3) Characteristics and application of materials and containers to packaging requirements of food. Prereq: 3220. 2 hrs and 1 lab.

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

4810 Microbiology in Food Manufacturing (3) Relationship of growth of common food microorganisms in fermentative and enzymatic changes occurring during processing and manufacture of foods. Prereq: Microbiology 2610 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 3810. 2 hrs and 1 lab.

4840 Meat Products Manufacturing I (3) Prepared meat products with emphasis on sanitation, information relating to cost controls, inspection and meat science. Prereq: 3940 or consent of instructor. 1 hr and 2 labs.

4920 Physical Phenomena of Foods (4) Physical states of food materials; foams, emulsions, colloidal solids, hydrates, crystals, gels. Effects of manufacturing practices on these properties. Prereq: Consent of instructor. 3 hrs and 1 lab.

GRADUATE

5000 Thesis

5100 Seminar (1)

5120 Food Color (3)

5130 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)

Forestry

Professors: J.W. Barrett (Head), Ph.D. Syracuse; H.A. Core, Ph.D. Syracuse; E. Thor, Ph.D. North Carolina State; F.W. Woods, Ph.D. Tennessee.


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

Forestry (396)

1820 Introduction to Forestry (3) History of forestry; establishment, care, protection, and use of forest stands; forest products industries; organization and agencies for establishment of forest policies; forest resources.

3020 Forest Environments and Ecology (3) Environments and ecology of forests and associated lands; emphasis on the application of ecological principles to contemporary problems. Available for graduate credit for non-forestry majors only. Prereq: 6 hours of biology. 3 hrs and 1 lab.

3040 Dendrology and Silvics of Woody Angiosperms (3) Classification, nomenclature, identification, and silvical characteristics of the more common woody angiosperms native to North America; native ranges, distribution patterns, and habitat requirements; regeneration requirements and life history, place in 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 hours basic biology or botany. 2 hrs and 1 lab.

3100 Forest Measurements and Biometry (4) Measurements of individuals in animal and plant populations; linear regression; sampling of forest populations; growth and potential production. Prereq: Plant and Soil Science 3610 and Computer Science 1410 or equivalent. 3 hrs and 1 lab. Available for graduate credit for non-forestry majors only.
3110 Greenhouse Management (3) Factors involved in production, culture, and use of greenhouse plants. Prerequisite: Graduate student standing and permission of instructor. 2 hrs and 1 lab.

3210 Turfgrass Management (4) Practical turfgrass management; cultivar selection, identification, and establishment; basic applied fertility programs, mowing and irrigation practices, and thatch control; pest identification and control. Prerequisite: Plant and Soil Science 330 or 340 and 8 hrs biological sciences. 3 hours and 1 lab.

3810 Ornamental Trees (3) Classification, identification, adaptation, and landscape design values. Prerequisite: 8 hrs biological science or permission of instructor. 3 lab.

3820 Ornamental Shrubs and Vines (3) Classification, identification, adaptation, and landscape design values. Prerequisite: 8 hrs biological science or permission of instructor. 3 lab.

3830 House Plants (3) Classification, identification, native habitat, propagation, adaptation and care. Prerequisite: 8 hrs biological science or permission of instruction. 3 lab.

4120 Landscape Design I (4) Design and development of property planning, organization, structure, selection and use of plant and structural materials, and methods of presentation. Prerequisite: Senior standing and permission of instructor. 2 hrs and 2 labs.

4140 Landscape Design II (4) Advanced theory of design. Pictorial and abstract approach to landscape design. Emphasis on recreational design from analysis of contemporary trends and objectives to projected needs and development of plans. Prerequisite: Senior standing and permission of instructor. 2 hrs and 2 labs.

4150 Wholesale Nursery Management (3) Production, labor and sales management; location, layout, culture, equipment and facilities. Prerequisite: 3030 or equiv. 2 hrs and 1 lab.

4160 Retail Nursery Management (3) Essentials of good nursery management: location, layout and operation of landscape nurseries, garden centers and similar businesses. Prerequisite: 3110. 3 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 quality of parks and their impact on environmental quality of rural and suburban communities. Prerequisite: 4120. 4140 recommended. 2 hrs and 2 labs.

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

4310 Floriculture I (3) Principles and practices employed in producing cut flower crops. Application of principles of plant physiology as they control flowering, plant quality, and harvesting schemes. Prerequisite: 3110, Plant and Soil Science 330 or equivalent. 2 hrs and 1 lab.

4320 Floriculture II (3) Principles and practices employed in producing floricultural crops in pots and other containers. Analysis of problems associated with growing plants in a very restricted soil volume under controlled greenhouse conditions. Prerequisite: 3110, Plant and Soil Science 330 or equivalent. 2 hrs and 1 lab.

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

4610 Seminar (1) Current problems in ornamental horticulture and landscape design. Prerequisite: Junior standing and permission of instructor.

GRADUATE

5000 Thesis

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

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

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

5210 Park and Public Grounds Management Systems (4)

5500 Seminar (1)

**Plant and Soil Science (792)**

**Graduate Program**

**5000 Thesis**

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

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

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

**5210 Park and Public Grounds Management Systems (4)**

**5500 Seminar (1)**

**Plant and Soil Science (792)**

Professors:

L.F. Seatz (Head), Ph.D. North Carolina State; F.F. Bell, Ph.D. Iowa State; H.A. Fribourg, Ph.D. Iowa State; L.M. Josephson, Ph.D. Wisconsin; W.L. Parks, Ph.D. Purdue; B.S. Pickett (Emeritus), Ph.D. Michigan State; L.M. Skold, M.S. Kansas State; M.E. Springer, Ph.D. California (Berkeley); H.D. Swingle, Ph.D. Louisiana State.

Associate Professors:


Assistant Professors:


*Clyde B. Austin Distinguished Professor.

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

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

3110 Soil Fertility and Fertilizers (4) Properties of soils in relation to plant nutrient availability and uptake. Methods of soil fertility evaluation and principles of fertilizer use; manufacture and properties of fertilizers. Prerequisite: 2130. 3 hrs and 1 lab.

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

3180 Fruit Crops Management (4) Soils, planting, cultivation, development of fruit crops plantations; pest control, harvesting, packing, storage and marketing. Prerequisite: Ag Biology 3210, 3310. 3 hrs and 1 lab.

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

3250 Soils in Forestry (3) Soil as a medium for tree growth; relation of physical, chemical, and biological properties of soils to tree growth and management of forest stands. Soil properties of importance in road location, recreational development and water resource management. Prerequisite: 2130, Forestry 3320. 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. Prerequisite: 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 sweet potatoes, beans, tomatoes, pepper, cucurbits, sweet corn and okra. Need not take 5310 as prerequisite. Prerequisite: 8 hrs 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. Prerequisite: 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 crops and non-crop uses. Prerequisite: 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. Prerequisite: 2100; Physics 1210. 3 hrs and 1 lab.

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

4230 Soil Analysis (3) Analytical techniques used in soil chemistry and soil fertility studies. Prerequisite: 4110, Chemistry 2140 or concurrent. Two 3-hr labs.

4250 Agricultural Chemicals and the Environment (4) Characteristics, use, mode of action, degradation, and environmental impact of chemicals used in agriculture, forestry, and related areas with emphasis on agricultural pesticides; environmental safeguards imposed by federal and state regulations on chemical development and use. Prerequisite: One year biological sciences 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. Prerequisite: 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 to maximum of 9 hours credit.


GRADUATE

5000 Thesis

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

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 (3)

5340 Soil Physics (3)

5370 Advanced Soil Fertility (3)

5390 Soil Physical Chemistry (3)

5600 Seminar (1)

5710 Advanced Plant Genetics (3)

5720 Quantitative Genetics (3)

5750 Advanced Plant Breeding (3)

5810 Crop Climatology (4)

5820 Advanced Crop Physiology and Ecology (4)

5850 Mechanisms of Herbicide Action (3)
College of Veterinary Medicine

Willis W. Armistead, Dean
C.F. Reed, Jr., Associate Dean
W.H. Grau, Jr., Assistant Dean

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

The College is organized in 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 consequently are qualified to pursue careers in many facets of veterinary medicine and related health professions.

Most American 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 also for veterinarians interested in research—both research for the direct benefit of animals and research conducted with animals but for the benefit of humans. 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 Science Building, also on the Agricultural Campus, and the Department of Microbiology is located in Hesler Biology Building on "The Hill" of the University of Tennessee, Knoxville.

The remainder of the College will be housed in a large teaching hospital which is under construction and scheduled for occupancy in 1978. In the interim, the Department of Environmental Practice is housed in the old Agricultural Engineering Building and the Department of Urban Practice is housed in McCord Hall on the Agricultural Campus. Headquarters of the Department of Pathobiology temporarily is in Morgan Hall.

The College also is developing research farm facilities at Knoxville and several satellite teaching-research facilities 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 preprofessional requirements:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Minimum Credits</th>
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<tbody>
<tr>
<td>English, including speech</td>
<td>12 credits</td>
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<tr>
<td>Humanities</td>
<td>12 credits</td>
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<tr>
<td>Social Sciences</td>
<td>12 credits</td>
</tr>
<tr>
<td>Mathematics</td>
<td>12 credits</td>
</tr>
<tr>
<td>Introductory calculus</td>
<td>8 credits</td>
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<tr>
<td>Chemistry: general</td>
<td>12 credits</td>
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<td>organic Hal.</td>
<td>12 credits</td>
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<tr>
<td>biochemistry</td>
<td>6 credits</td>
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<tr>
<td>Physics</td>
<td>12 credits</td>
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<tr>
<td>Biology or zoology</td>
<td>12 credits</td>
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<tr>
<td>Microbiology</td>
<td>4 credits</td>
</tr>
<tr>
<td>Animal Science, including nutrition and genetics</td>
<td>13 credits</td>
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</tbody>
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$115$ $78$

*Excluding laboratory.

In the professional curriculum of the College of Veterinary Medicine, the professional curriculum is a three-year, year-round program, including summers. The first year (3 quarters) consists mostly of preclinical subjects such as anatomy, physiology, microbiology, parasitology, and general pathology. The second year (4 quarters) includes the study of diseases, their causes, diagnosis, treatment, and prevention. The final year (4 quarters) 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.

Admission Procedure

Admission of new students will be for the fall quarter each year. Applicants will be screened carefully by a faculty committee to determine those best qualified for admission within the College enrollment quota.

Applicants will be considered in the following order of priority: (1) residents of Tennessee; (2) legal residents of states with which the University of Tennessee has contracts for veterinary medical education; (3) residents of other states or foreign countries.

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

Director of Admissions
320 Student Services Building
University of Tennessee
Knoxville, Tennessee 37916

Applications must be completed and mailed as to reach the Director of Admissions by January 31 each year. All preprofessional requirements must be completed by the end of the spring term of the year in which the student plans to enroll in the College of Veterinary Medicine.

Course Load

The professional curriculum of the College of Veterinary Medicine requires a specific number of hours for each quarter. A student may enroll for fewer or more than that number only with the permission of the Dean. Because of the sequential and highly integrated character of the professional curriculum, all courses in a given quarter are considered prerequisite to those in the succeeding quarter.

Professional Curriculum

The professional curriculum in veterinary medicine is a three-year, year-round program, including summers. The first year (3 quarters) consists mostly of preclinical subjects such as anatomy, physiology, microbiology, parasitology, and general pathology. The second year (4 quarters) includes the study of diseases, their causes, diagnosis, treatment, and prevention. The final year (4 quarters) 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
- Vet. Animal Science 8510...4
- Vet. Animal Science 8540...4
- Vet. Medicine 8310...2
- Vet. Microbiology 8101...5
- Vet. Animal Science 8240...3
- Environmental Practice 8611...1

19 hours

Winter Quarter
- Vet. Animal Science 8520...4
- Vet. Animal Science 8550...4
- Vet. Medicine 8311...2
- Vet. Microbiology 8102...3
- Vet. Animal Science 8250...4
- Environmental Practice 8612...2

19 hours

Spring Quarter
- Vet. Microbiology 8103...3
- Pathobiology 8730...3
- Pathobiology 8710...6
- Vet. Medicine 8010...1
- Vet. Medicine 8312...3
- Vet. Medicine 8320...3

19 hours

Total: 57 hours

Second Year

Summer Quarter
- Vet. Medicine 8340...4
- Vet. Medicine 8341...3
- Vet. Medicine 8342...8
- Vet. Medicine 8352...6
- Vet. Medicine 8353...2
- Vet. Medicine 8344...1

21 hours

Fall Quarter
- Vet. Medicine 8350...7
- Vet. Medicine 8351...4
- Vet. Medicine 8352...7
- Vet. Medicine 8353...2
- Vet. Medicine 8344...1

21 hours

Winter Quarter
- Vet. Medicine 8360...6
- Vet. Medicine 8361...6
- Vet. Medicine 8362...3
- Vet. Medicine 8363...2
- Vet. Medicine 8364...1
- Vet. Medicine 8365...2
- Vet. Medicine 8344...1

21 hours

Spring Quarter
- Vet. Medicine 8370...9
- Vet. Medicine 8371...3
- Vet. Medicine 8372...3
- Vet. Medicine 8373...3
- Vet. Medicine 8374...3
- Vet. Medicine 8344...1

22 hours

Total: 85 hours

Departments of Instruction

Animal Science (114)—Veterinary Medicine

Professors:
- R.R. Johnson (Head), Ph.D. Ohio State; M.C. Bell, Ph.D. Oklahoma State; J.K. Blomeyer, Ph.D. Ohio State; C.C. Chamberlain, Ph.D. Iowa State; S.L. Hansard, Ph.D. Florida; H.M. Jamison, Ph.D. Tennessee; J.B. McClure, Ph.D. Auburn; M.J. Montgomery, Ph.D. Wisconsin; G.M. Merriman, D.V.M. Michigan State; R.L. Murphey, Ph.D. Washington; D.O. Philpott, Ph.D. Ohio State; H.V. Shirley, Ph.D. Illinois; R.R. Shrode, Ph.D. Iowa State; E.W. Swanson, Ph.D. Missouri; R.L. Tugwell, Ph.D. Kansas State; C.E. Wylie (Emeritus), A.M. Missouri.

Associate Professors:

Assistant Professors:
- J.A. Corriss, Ph.D. Tennessee; D.G. Doyle, Ph.D. Cornell; J.P. Hackworth, Ph.D. Michigan State; J.W. Holloway, Ph.D. Oklahoma State; F.B. Masincupp, Ph.D. Kansas State; M.H. Sims, Ph.D. Auburn; J.D. Smalling, Ph.D. Texas A & M.

Instructor:

In addition, academic expertise of staff members at CARL and Oak Ridge are used on appropriate occasion.

8240-50 Veterinary Physiology (3, 4) Introduction to concepts and problems in animal physiology which form a base for clinical applications and for formal training in pharmacology, medicine, pathology and surgery. Order: O.D. sequence: respiratory, cardiovascular, digestive, and genito-urinary, etc. Three hours of lecture for 8240; 4 hours of lecture for 8250.

8510-20 History (4, 4) Microscopic anatomy of respiratory, cardiovascular, digestive, urinary, and reproductive systems; histology; and specialization. Sequence of presentation as listed above. Correlated with 8510-00. Two hours of lecture and two laboratories.

8540-50 Gross Anatomy (4, 4) Gross anatomy of common domestic species. Lecture; dissection of embalmed specimens; study of prosections; slides, models, and living animals. Cardiovascular and respiratory systems are first in sequence. Correlated with 8510-20 if possible. One-hour lecture and two laboratories.

Environmental Practice (346)

Professor:
- H. Kitchen (Head), D.V.M. California (Davis), Ph.D. Florida.

Associate Professor:
- J.W. Oliver, D.V.M., Ph.D. Purdue.

Assistant Professor:
- D.J. Black, D.V.M. Michigan State.

8611-12 Pharmacology (1, 2) Theories of concepts of drug action and distribution. Receptor theory, adverse effect theories, principles of drug action, and antidepressant drugs; correlated with Animal Science 8240-50. One-hour lecture for 8611; Two hours of lecture for 8612.

Microbiology (685)—Veterinary Medicine

Professors:

Associate Professors:
- J.M. Becker, Ph.D. Cincinnati; T.C. Montie, Ph.D. Maryland; W.S. Riggby, Ph.D. Yale.

Assistant Professors:

8101 Microbiology I (5) Part I, Basic microbiology; microbial structure, metabolism, macromolecules and genetics. Part II, Immunology, nonspecific and specific humoral and cellular host response to infection and "foreign" material, immunopathology, and certain aspects of immunogenetics (e.g., transplantation). Three hours of lecture and two laboratories.

8102 Microbiology II (3) Part I, Bacterial pathogenesis: disease patterns and mechanisms of bacterial pathogenesis related to their properties including proteins, enzymes, and other bacterial products. Part II, Viral pathogenesis; disease patterns and mechanisms of viral pathogenesis related to their properties including acute, latent, and "slow virus" infections, and cancer. Two hours of lecture and one laboratory.

8103 Microbiology III (3) Part I, Viral pathogenesis continued. Part II, Medical mycology; disease patterns and mechanisms of pathogenesis of yeasts, molds, and "imperfect" fungi, related to their properties, including spores, dimorphism, etc. Two hours of lecture and one laboratory.

Pathobiology (742)

Professors:

Associate Professor:

8710 Veterinary Pathology (6) Principles of pathology including causes of disease, disturbance of cell growth, inflammation, and neoplasms; introduction of clinical pathology. Three hours of lecture and three laboratories.

8730 Veterinary Parasitology (3) Principles of parasitology, protozoology, helminthology, and entomology and their relation to disease in animals. Two hours of lecture and two laboratories.

Rural Practice (870)

Professors:

Associate Professors:

Assistant Professors:
- J.W. Allen, D.V.M. Texas A & M; D.O. Goble, D.V.M. Kansas State; R.D. Jones, D.V.M. Western College of Veterinary Medicine, Saskatchewan; (Canada); M.A. Walker, D.V.M. Texas A & M.
Urban Practice (886)

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


Interdepartmental Offerings

Veterinary Medicine (987)

8010 Professional Relations (1) Professional speaking and writing, research design and data interpretation, and public relations. One-hour lecture.

8310 Introduction to Veterinary Medical Practice (2) Species, breed identification, basic care, feeding, restraint and handling. Introduction to physical diagnosis, intravenous techniques, fluid sampling, etc. One-hour lecture and one laboratory.

8311 Introduction to Veterinary Medical Practice (2) Physical diagnosis, history taking, and client relations; anesthetic principles, agents, and techniques. One-hour lecture and one laboratory.

8312 Introduction to Veterinary Medical Practice (2) Basic surgical principles, preparation for surgery, wound healing and suturing; fundamentals of radiology. Correlated with 8330. Two hours of lecture and one laboratory.

8320 Medical Science Interactions (3) Multidiscipline laboratory: Demonstrations and surgical experiments to illustrate variety of physiologic and pharmacologic principles. Emphasis on anesthetic techniques, basic clinical chemistry. (i.e., acid-base) provides appreciation for survival and emergency techniques and for drug action. Correlated with 8312. Two hours of lecture and one laboratory.

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

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

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

8343 Patterns of Disease (5) Host-agent relationship in disease of animals. Pathogenesis, laboratory diagnosis, control, and public health significance are the major components. Principles of epidemiology and their application in the study of diseases in animal populations illustrated.

8344 Focal Problems (1) Series of sessions to consider specific diagnostic problems or paramedical subjects important to veterinary medical practice. Some sessions consider differential etiology, diagnosis, and treatment of certain disease signs or symptoms; others consider implications for veterinarian of medical jurisprudence and ethics, practice economics, and veterinary history. May be repeated. S/NC.

8350 Endocrine—Reproductive System (7) Reproductive diseases of animals with emphasis on anatomic and functional aspects. Biochemical and physiologic basis of endocrine diseases of animals, including diagnosis, treatment, and management. Endocrine interrelationships, including methods of examination of mammary glands and reproductive tract, diagnosis, and treatment.


8352 Cardiovascular—Respiratory Systems (7) Pathogenesis, diagnosis, and management of cardiovascular and respiratory diseases of animals. Anatomic, physiologic and pharmacologic principles providing the basis for medical and surgical treatment.

8353 Metabolic Diseases (2) Biochemical and physiologic determinants of metabolic diseases of animals, their diagnosis and prevention.

8360 Musculoskeletal System I (6) Diagnosis and treatment of muscular and skeletal diseases of small animals, emphasizing pathologic changes, radiologic techniques, interpretation of radiographs, and surgical procedures.

8361 Musculoskeletal System II (6) Diagnosis, prognosis, and management of musculoskeletal diseases of large animals, with emphasis on functional anatomy, radiographic techniques and interpretation, and surgical procedures applicable to equines and ruminants.

8362 Toxicology (3) Pharmacologic basis and pathologic features of diseases of animals caused by common toxic chemicals, with emphasis on clinical manifestations, diagnosis, and treatment.

8363 Public Health (2) 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.

8364 Nutritional Diseases of Animals (1) Biochemical and physiologic determinants of nutritional disease, with rational bases for treatment and prevent.