College of Agricultural Sciences and Natural Resources

O. Glen Hall, Dean
Gary Schneider, Associate Dean

The College of Agricultural Sciences and Natural Resources traces its history to 1869 when the University was designated as Tennessee’s Federal Land-Grant Institution. Under terms of the Federal Land-Grant Act, the University was enabled for the first time to offer instruction in agriculture. This later was expanded to include research for the development of new knowledge and extension for dissemination of such knowledge to rural people.

Two separate administration units—the Agricultural Experiment Station and the Agricultural Extension Service—were organized to provide research and extension services, respectively. More recently a College of Veterinary Medicine was established. These three units and the College now constitute the University of Tennessee’s Institute of Agriculture. Thus, the College of Agricultural Sciences and Natural Resources is not only an academic unit of The University of Tennessee, Knoxville campus, it is also an important administrative unit of the Institute of Agriculture.

There are many shared resources and positive interactions between various units of the Institute. For example, most of the faculty in the College of Agricultural Sciences and Natural Resources hold joint appointments in the Agricultural Experiment Station and they are actively involved in significant basic and applied research in agriculture and the associated natural resources. On campus and field research laboratories are utilized in the instructional programs of the College, while extension and research activities provide many students excellent part-time job opportunities.

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

CURRICULA IN AGRICULTURE

Broad opportunities for individuals to prepare for a future in agriculture, forestry, and wildlife and fisheries science are offered in the College of Agricultural Sciences and Natural Resources.

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 Science in Ornamental Horticulture and Landscape Design and Bachelor of Science in Wildlife and Fisheries Science. The professional degree program in agricultural engineering receives strong support from the College of Engineering and is fully accredited by the Accreditation Board of Engineering and Technology. The forest resource management and wildland recreation concentrations are fully accredited by the Society of American Foresters.

A pre-professional curriculum in veterinary medicine is offered in the College. This program is designed to prepare students for admission to the College of Veterinary Medicine located on the Knoxville campus.

Students pursuing programs leading to the degree of Bachelor of Science in Agriculture major in one of several specialized areas of agriculture offered in the college. These major areas are agricultural economics and business, agricultural education, animal science, food technology and science, 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 he/she 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 advisor.

Students pursuing a program leading to the degree of Bachelor of Science in Agricultural Engineering may select the concentration offered in food engineering. Students seeking the Bachelor of Science in Forestry may choose concentrations in forest resources management, wildland recreation or wood utilization.

All academic and general requirements of the University as stated in the front section of this catalog must be met by agricultural students, and they must complete the requirements in one of the organized curricula. Students transferring into the College of Agricultural Sciences and Natural Resources from other than the UT Knoxville campus must have a grade point average of 2.0.

The use of transfer credit in technical subject matter areas appropriate to each organized curriculum will be considered and approved by the advisor of that curriculum and the Dean of the College of Agricultural Sciences and Natural Resources. 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 semester in residence and must be conducted under the supervision of the head of the department in which the course is offered.

A minimum of 18 semester hours of upper division technical agriculture appropriate to a specified major requirement, and approved by the major advisor, must be completed in residence to fulfill the requirements of baccalaureate degrees offered in the college.

A minimum grade point average of 2.0 for all courses taken in the department offering the major/concentration is required.

SATISFACTORY/NO CREDIT COURSES

Students may include a maximum of 21 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.

DOCTORAL PROGRAMS

Graduate study programs lead to the Doctor of Philosophy degree in animal sciences, agricultural economics, agricultural engineering,
FACILITIES

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

Four farms adjacent to or within eight miles of the agricultural campus are used both for instructional and experimental purposes. Morgan Farm (80 acres), Cherokee Farm (150 acres), Plant Sciences 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 (12,500 acres of forested land) provide excellent facilities for field work in forestry, wildlife and fisheries.

Transportation by bus is provided for classes of agricultural students from the agricultural campus to the University farms and to other points of interest where instruction may be given. Transportation by bus is provided between the agricultural campus and the main University campus so that students may make 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 areas of special interest may choose the curriculum most adaptable to their needs when they register as freshmen, and an advisor from the department will be assigned for their counseling. It is not necessary, however, that freshman students select their curriculum until the end of the first year. Those who are in doubt will be assigned a special advisor to assist them in exploring agriculture and to guide them in the planning of appropriate courses of study for the freshman year. When they choose a curriculum, an 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 beyond the baccalaureate degree may be established in any curriculum if appropriate electives are included; also, courses may be elected in any of the curricula leading to the degree of Bachelor of Science in Agriculture, in preparation for employment with the Agricultural Extension Service. For this purpose, both the major-curriculum 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 or triple major by satisfying all the requirements in each curriculum. For this purpose, the advisor for the major curriculum should be consulted, the dean of the College of Agricultural Sciences and Natural Resources should be informed, and each advisor should maintain a complete record of the student’s progress. The multiple major will normally require more than 132 hours credit for graduation.

OPTIONAL MINORS

Agricultural students may have single or multiple minors in agriculture or in other colleges on their transcripts without regard to course overlap among majors and minors.

A minor in a department of the College of Agricultural Sciences and Natural Resources requires a minimum of 16 credit hours in courses numbered 200 and above with the majority of credit hours at the 300 and 400 level. At least 9 of the credit hours required for the minor must be completed at UT Knoxville. Specific requirements are listed by each department offering a minor.

Minors offered in the College of Agricultural Sciences and Natural Resources are open to students of other colleges who have the approval of their advisor and department.

MINIMUM REQUIREMENTS FOR BACCALAUREATE DEGREE PROGRAMS

All B.S. degree programs offered in the College have the following minimum requirements:

Agriculture and Renewable Natural Resources Perspectives (8)

Biological Sciences (College of Agricultural Sciences and Natural Resources courses included) (8)

Computer Science (3) [Or equivalent experience. See specific departmental requirements]

English and Communications (including English Composition (6), Speech (3), and Writing or Speaking elective (3) (12)

English Composition (6)

Speech (3)

Writing or Speaking elective (3)

Mathematics (6)

Physical Sciences (Chemistry, Physics, Geology) (8)

Social Sciences and Humanities (including Economics (4) and electives (6) (12)

Economics (4)

Electives (8)

Directed Electives (5)

Major Courses (24)

College of Agricultural Sciences and Natural Resources courses (outside of the major department) designated by the department and/or electives (12)

Other courses designated by the department and/or electives (38)

For a total of 132 hours.

1 Bachelor of Science in Agricultural Engineering

2 Must be courses in English and communications, biological sciences, physical sciences, or social sciences and humanities or combinations of these subject matter areas.

3 Bachelor of Science in Agriculture and Rural Sociology

INDEPENDENT STUDY

Independent study and special topics courses and seminars offered in each department provide exceptional students the opportunity to explore in greater depth subject matter of unusual significance to agriculture. 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 and the renewable natural resources in the study of a common problem provides an unusual challenge.

COURSE LOAD

Students desiring to take more than 19 hours per semester must have the approval of the dean of the college.

TRANSFER STUDENTS

Students who transfer to the College of Agricultural Sciences and Natural Resources from another institution, or from another college at UT Knoxville, should consult the dean if in doubt about 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 semester of study in the selected curriculum.

AGRICULTURAL ECONOMICS AND BUSINESS CURRICULUM

Professors:

H. Williamson (Head), Ph.D. Missouri; M.B. Badenhop (Emeritus), Ph.D. Purdue; J.R. Brocker, Ph.D. Florida; C.L. Cleland, Ph.D. Wisconsin; D.B. Eastwood, Ph.D. Tufts; B.C. English, Ph.D. Iowa State; L.H. Keller (Emeritus), Ph.D. Kentucky; T.H. Klintl (Assoc. Dean), Ph.D. Kansas; F.O. Leuthold, Ph.D. Wisconsin; J.A. Martin (Emeritus), Ph.D. Minnesota; D.L. McLemore, Ph.D. Clemson; B.R. McManus (Emeritus), Ph.D. Purdue; S.D. Mundy, Ph.D. Tennessee; R.H. Orr, Ph.D. Illinois; W.M. Park, Ph.D. Virginia Polytechnic Institute; D.E. Ray, Ph.D. Iowa State; F.R. Roberts, Ph.D. Iowa State; C.B. Sappington (Emeritus), Ph.D. Illinois; T.J. Whatley (Emeritus), Ph.D. Purdue.

Associate Professors:

K.L. Jensen, Ph.D. Oklahoma State; G.K. Pompelli, Ph.D. California (Davis).

Assistant Professors:

G.C. Davis, Ph.D. North Carolina State; P.M. Jakus, Ph.D. North Carolina State; J.A. Larson, Ph.D. Oklahoma State; F.B. Siegel, Ph.D. Virginia Polytechnic Institute; J.R. Stokes, Ph.D. Texas A&M.

AGRICULTURAL ECONOMICS AND BUSINESS CURRICULUM

Advisors:

Professors Cleland, Eastwood, McLemore, Mundy, Park and Roberts. Assistant Professors Davis, Jakus, and Larson.

This curriculum is designed to provide students with training in the social sciences as
well as in the physical and biological sciences and technical agriculture. Through course selection, students may prepare for employment in the rapidly expanding field of agricultural business or in the field of farm production and related areas. The business oriented student will be prepared for the management phases of agricultural business. Employment opportunities include work in marketing of agricultural products, agribusiness firm management, agricultural credit agencies and banks, farm real estate and appraisal services, public and private market analysis, and farm information services utilizing mass communications.

Farm management oriented students will be prepared for positions such as farm managers, county agricultural agents, managers of farm supply and purchasing firms, agricultural journalists, and farm loan agents. The curriculum also provides the necessary background for graduate work in agricultural economics.

Minor consists of 19 credit hours including Economics 201, Agricultural Economics 210, 342, 350, and 6 hours of Agricultural Economics and Rural Sociology electives.

AGRICULTURAL EXTENSION EDUCATION

Although no formal undergraduate curriculum is offered in Agricultural Extension Education, undergraduate courses are available as electives in each formal curriculum. These courses are designed to develop an understanding of the functions, responsibilities, and techniques of the Agriculture Extension Service, and to provide prospective Extension employees with work experience in selected training counties.

AGRICULTURAL EDUCATION

Students who complete the requirements for graduation in Agricultural Education receive a Bachelor of Science Degree in Agriculture with a Major in Agricultural Education. The curriculum is designed to prepare persons to assume educational and leadership roles in many phases of the agricultural industry, including agribusiness, schools, agencies, and farming and ranching. Emphasis is on preparing students to teach agricultural education or serve as an educator with the Agricultural Extension Service. Students may choose to concentrate either in the teacher education (certification) option or the professional services option.

The teacher education option is designed to prepare students to meet teacher certification requirements for agricultural education. Teacher Certification is given through the College of Education. Students must file for admission to Teacher Education in the College of Education. (See Admission to Teacher Education and Student Teaching section.)

Students who choose the professional services option may substitute additional technical agriculture and/or internship hours equivalent to the number of hours of student teaching required in the teacher education option. With advisor approval additional hours, required specifically for certification, may also be substituted with courses in the humanities, social sciences or technical agriculture areas. This option provides a broad-based curriculum designed for those students who wish to prepare for careers with the Agricultural Extension Service, agribusiness, government agencies, and farming and ranching. This option does not prepare a student to meet teacher certification requirements.

AGRICULTURAL AND EXTENSION EDUCATION

Professors:

Associate Professor:
R.G. Waters, Ph.D. Penn State.

The Department of Agricultural and Extension Education has two educational areas of emphasis; namely, Agricultural Extension Education and Agricultural Education.
Engineering; and Food Engineering are available. A concentration should be selected early in the academic program since there are differences as early as the freshman year.

Graduates may pursue careers in design, analysis, or development in power and machinery, electrical and electronic systems, processing and materials handling systems, and food engineering.

Each concentration in the curriculum has provisions for elective courses to be taken in the student's area of interest. Students must consult with their advisors each semester regarding the selection of courses and should outline a plan for all such electives before starting the junior year. In the senior year, comprehensive design of systems and their components is emphasized.

Students majoring in agricultural engineering are eligible to participate in the Engineering Cooperative Scholarship program and other student activities in the College of Engineering. Agricultural engineering majors interested in student activities in the College of Engineering, Cooperative Scholarship program and other components is emphasized.

Students majoring in architectural engineering are eligible to participate in the Engineering Cooperative Scholarship program and other student activities in the College of Engineering. Agricultural engineering majors interested in student activities in the College of Engineering, Cooperative Scholarship program and other components is emphasized.

Students majoring in architectural engineering are eligible to participate in the Engineering Cooperative Scholarship program and other student activities in the College of Engineering. Agricultural engineering majors interested in student activities in the College of Engineering, Cooperative Scholarship program and other components is emphasized.

Students majoring in architectural engineering are eligible to participate in the Engineering Cooperative Scholarship program and other student activities in the College of Engineering. Agricultural engineering majors interested in student activities in the College of Engineering, Cooperative Scholarship program and other components is emphasized.
prepare students in other disciplines to apply elementary principles, techniques and systems of engineering to the broad industry of agriculture. A minor in agricultural engineering technology requires a minimum of 18 semester hours as follows: Agricultural Engineering Technology 202, 212, 432, 442 and two of the three courses 422, 452, 462.

A program leading to the Master of Science degree with a major in agricultural engineering technology is available (see the Graduate Catalog). The graduate program is open to qualifying BS graduates from other disciplines who earn a minor in agricultural engineering technology or who completed courses equivalent to those required for the minor in agricultural engineering technology.

**ENTOMOLOGY AND PLANT PATHOLOGY**

**Professors:**
- C.J. Southards (Head), Ph.D. North Carolina State; E.C. Bernard, Ph.D. Georgia; R.R. Gerhardt, Ph.D. North Carolina State; J.W. Hilty, Ph.D. Ohio State; P.L. Lambdin, Ph.D. VIP and SU; C.D. Pless, Ph.D. Clemson.

**Associate Professors:**

**Assistant Professors:**

**Instructors:**
- C.J. Southards (Head), Ph.D. North Carolina State; E.C. Bernard, Ph.D. Georgia; R.R. Gerhardt, Ph.D. North Carolina State; J.W. Hilty, Ph.D. Ohio State; P.L. Lambdin, Ph.D. VIP and SU; C.D. Pless, Ph.D. Clemson.

**Associate Professors:**

**Instructors:**
- C.J. Southards (Head), Ph.D. North Carolina State; E.C. Bernard, Ph.D. Georgia; R.R. Gerhardt, Ph.D. North Carolina State; J.W. Hilty, Ph.D. Ohio State; P.L. Lambdin, Ph.D. VIP and SU; C.D. Pless, Ph.D. Clemson.

**Assistant Professors:**

The curriculum is designed to prepare students for leadership careers in livestock production and related industries. Courses in animal husbandry, feed companies, meat animal, milk, egg or poultry production, managerial or marketing groups, other educational agencies, supply and equipment business, agricultural extension services, agricultural communication, public relations, and various organizations associated with agriculture.

**A minor in animal science** consists of 3 credits from 260 (Animal Industry & Market Evaluation) or 280 (Farm Animal Management Practices); 4 credits from 330 (Animal Nutrition, Feeds & Ration Formulation); 3 credits from 381 (Animal Production Systems) or one of the 480 series plus 6 credits from the following list: 220, 320, 340, 380, no more than one of the 360 series, 420, 430, 440, the 480 series, and no more than 3 credits from 493.

### ANIMAL SCIENCE WITH CONCENTRATION IN PRODUCTION/MANAGEMENT

#### Hours Credit

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Agriculture 101</td>
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<tr>
<td>Biology 110</td>
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<tr>
<td>English 101-102</td>
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<tr>
<td>Mathematics 121-122 or 141-142 or 151-152</td>
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<tr>
<td>Chemistry 100-110 or 120-130</td>
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<tr>
<td>Animal Science 101</td>
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<td>Animal Science 101</td>
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Total: 132 hours
PRE-VETERINARY MEDICINE PROGRAM

This program allows students to be awarded a B.S. degree in Agriculture with a major in Animal Science, after the successful completion of the first two semesters in the College of Veterinary Medicine (CVM). Students must begin this program early in the pre-veterinary curriculum. The specific requirements are:

1. Completion of all pre-veterinary requirements.
   a. English Comp. 101-102 (3,3) - 6 hours
   b. Humanities and Social Sciences - 18 hours
   c. Calculus A-B, 121-122 or Calculus I-II, 141-142 or Biocalculus I-II, 151-152 (3,3) - 6 hours
   d. Elements of Physics 221-222 (4,4) - 8 hours
   e. General Chemistry 120-130 (4,4) - 8 hours
   f. Organic Chemistry 350-360 and Laboratory 389 (3,3,2) - 8 hours
   g. Cellular and Comparative Biochemistry 410 (4) - 4 hours
   h. General Biology 110-120 (4,4) - 8 hours
   i. Genetics 220 - 4 hours
   j. Cell Biology 210 - 4 hours

2. The last 30 hours of the three-year pre-veterinary curriculum must have been taken at UT Knoxville.

3. At least 12 hours of upper division (300 and 400 level courses) technical agriculture courses must be taken at UT Knoxville.

4. In addition to all the required pre-veterinary medical courses, the following (or approved equivalents) must be completed before entering the College of Veterinary Medicine.
   a. Animal Science 101 - 1 hour
   b. Agriculture 101 - 3 hours
   c. Agriculture 260 - 3 hours
   d. Animal Science 330 - 3 hours
   e. Animal Science 330 - 4 hours
   f. Animal Science 340 - 3 hours
   g. Animal Science 380 - 3 hours
   h. One course from Animal Science 481, 482, 483, 484, 485, 486, or 489 - 3 hours
   i. Computer Science Elective - 3 hours
   j. Economics 201 - 3 hours
   k. Speech 210 or 240 - 3 hours

NOTE: Agriculture 101, Economics 201 and Speech 210 or 240 will be accepted by the CVM as meeting requirements in the Humanities/Social Sciences category. The remainder must be a Social Science elective, a Humanities elective, and a Humanities elective described as writing intensive. Writing intensive History courses may also be used. I. Non-Animal Science Agriculture - 6 hours

5. Satisfactory completion of the first two semesters in the CVM professional program.

6. No later than December 31 of the student's first year in the CVM (she) should contact the Animal Science Department in order to check on graduation procedures for this program.

7. A total of 132 hours must be completed by the end of the first year in the CVM.

FOOD SCIENCE AND TECHNOLOGY

C.J. Brekke (Head), Ph.D. Wisconsin; J.L. Collins, Ph.D. Maryland; F.A. Draughon, Ph.D. Georgia; H.O. Jaynes (Emeritus), Ph.D. Illinois; S.L. Melton, Ph.D. Tennessee; J.T. Miles (Emeritus), Ph.D. Wisconsin; W.W. Overcast (Emeritus), Ph.D. Iowa State; M.P. Penfield, Ph.D. Tennessee.

Associate Professors: G.L. Christen, Ph.D. Missouri; H.D. Lovejoy, Ph.D. Kansas State; J.R. Mount, Ph.D. Ohio State.

Assistant Professor: D.A. Golden, Ph.D. Georgia.

Advisors: Collins, Draughon, Lovejoy, Melton, Mount, and Penfield.

The major in food science and technology prepares students to apply the sciences and engineering technology to manufacture, preserve, store, and distribute foods that meet the needs and desires of consumers. Coursework emphasizes the basic principles of converting raw food materials into acceptable consumer products. Selected commodity courses are described as meeting requirements in the CVM.

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 management, ingredients specialist, etc. The program of coursework is described as meeting requirements in the CVM.
FORESTRY, WILDLIFE AND FISHERIES

Professors:  
J.W. Barrett (Emeritus), Ph.D. Syracuse; E.R. Buckner, Ph.D. North Carolina State; H.A. Core (Emeritus), Ph.D. Syracuse; B.L. Deardorff, Ph.D. Colorado State; R.W. Dimnick, Ph.D. Wyoming; R.L. Little, Ph.D. North Carolina State; D.M. Ostermeier, Ph.D. Syracuse; M.R. Pelton, Ph.D. Georgia; G. Schneider (Associate Dean, College of Agricultural Sciences and Natural Resources), Ph.D. Michigan State; R.J. Strange, Ph.D. Oregon State; E. Thor (Emeritus), Ph.D. North Carolina State; J.L. Wilson, Ph.D. Tennessee.

Associate Professors:  

Assistant Professors:  
D.A. Buehler, Ph.D. Virginia Polytechnic Institute; J.M. Fly, Ph.D. Michigan.

The department offers two majors. The major in forestry leads to the degree Bachelor of Science in Forestry and the major in wildlife and fisheries science leads to the degree Bachelor of Science in Wildlife and Fisheries Science. The forestry major has three concentrations: Forest Resources Management Concentration, Wildland Recreation Concentration, and Wood Utilization Concentration.

A joint program between the department and Knoxville College allows students to earn a B.S. in Biology from Knoxville College while taking courses at UTK for a degree in Forestry, Wildlife and Fisheries Science. The wildlife major has three concentrations: Wildlife and Fisheries Sciences Concentration, Plant and Soil Sciences Concentration, and Environmental Sciences Concentration.

Listsof courses for specializations and minors are available at the Department of Forestry, Wildlife and Fisheries Office.

FORESTRY

The profession of forestry is the science, the art, and the practice of managing and using for human benefit the natural resources which occur on and in association with forest lands. Benefits are derived from the multiple resources of the forest: wood, water, wildlife, recreation, forage, and environmental amenities.

A minor in Forestry consists of 16 credit hours as follows: FWF 211 or FW F 250, FW F 311 and 9 hours from FW F 312, 313, 315, 316 and 416 and Forestry designated courses.

FOREST RESOURCES MANAGEMENT CONCENTRATION

The Forest Resources Management Concentration provides an opportunity to obtain an education related to the management of the broad spectrum of forest resources. In addition to the core of required courses, there are about 18 elective credits available for broad studies or specialized training in one or more areas of forestry.

These areas and examples of related fields of study are: Forest Biology including plant physiology and morphology, ecology, genetics, tree nutrition, forest soils, Forest Business Management including economics, accounting, finance, marketing, management science; Forest Economics including economics, business administration, social science; Forest Inventory including mathematics, statistics, computer science, photogrammetry; Forest Recreation including natural and social sciences; and wildlife Management including ecology, zoology, botany.

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

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

WILDLAND RECREATION CONCENTRATION

The Wildland Recreation Concentration provides 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 also learn the basic philosophy and principles associated with leisure time and its use along with the relationship of forest resources to the constructive use of leisure time.

WILDLAND RECREATION CONCENTRATION

The Wildland Recreation Concentration provides 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 also learn the basic philosophy and principles associated with leisure time and its use along with the relationship of forest resources to the constructive use of leisure time.

Hoursof Credit

Freshman

English 101, 102 6
Mathematics 119, 121 6
Botany 110, 120 6
Chemistry 100 6
Forest and Fisheries Sciences Elective 6

Sophomore

Mathematics 119, 121 6
Botany 110, 120 6
Chemistry 100 6
Forest and Fisheries Sciences Elective 6

Senior

Mathematics 119, 121 6
Botany 110, 120 6
Chemistry 100 6
Forest and Fisheries Sciences Elective 6

Total: 135 hours

Lists of appropriate courses in Social Sciences, Humanities, History, and Communications are available at the Department of Forestry, Wildlife, and Fisheries Office.

Students will choose one course from Philosophy 110, 130, 240, 280, 342, or 346.

*Electives are chosen in conference with advisor.

WOOD UTILIZATION CONCENTRATION

The Wood Utilization Concentration offers students with an interest in business, engineering, materials science, and processing technology an opportunity to concentrate their studies and interest in the forest products industry.

Specific coursework in the department focuses on wood properties, solid wood processing, wood composites and gluing, and measurement and marketing of wood products, and includes field trips to local industries and extensive use of laboratory facilities on campus.

A sound background in basic sciences is required. With elective credits students may select specific additional coursework in areas of interest that will augment their understanding of industry operations and could include study in business, engineering, or business management.

Excellent career opportunities are anticipated in all areas of the industry.

Hoursof Credit

Freshman

English 101, 102 6
Mathematics 119, 121 6
Botany 110, 120 6
Chemistry 100 6
Physics 103 6
Agriculture 101 6
FWF 211, 300 6

Sophomore

Mathematics 119, 121 6
Botany 110, 120 6
Chemistry 100 6
Forest and Fisheries Sciences Elective 6

Junior

Mathematics 119, 121 6
Botany 110, 120 6
Chemistry 100 6
Forest and Fisheries Sciences Elective 6

Senior

Mathematics 119, 121 6
Botany 110, 120 6
Chemistry 100 6
Forest and Fisheries Sciences Elective 6

Total: 135 hours

*Lists of appropriate courses in Social Sciences, Humanities, History, and Communications are available at the Department of Forestry, Wildlife, and Fisheries Office.

*Students will choose one course from Philosophy 110, 130, 240, 280, 342, or 346.

Agriculture 101 6
FWF 211, 300 6
Social Science Elective 6

*Electives are chosen in conference with advisor.

*Electives are chosen in conference with advisor.
WILDLIFE AND FISHERIES SCIENCE

Wildlife and fisheries management is the science and art of maintaining populations of wild animals at levels consistent with the best interests of wild species and of the public. Management goals may be aesthetic, economic, or ecological. Success depends upon wildlife and fisheries biologists providing assistance; 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.

A minor in Wildlife and Fisheries Science consists of 16 hours from FWF 201 or 250, FWF 300, 317, 410, 416, WFS 341, 441, 444, 445 and 446. Prerequisites will not be waived.

Professors:

G.D. Crater (Head), Ph.D. Ohio State; L.M. Callahan, Ph.D. Rutgers; E.T. Graham, Ph.D. Pennsylvania State; P.M. Gresshoff, Ph.D. Australian National University; G.L. McDaniel, Ph.D. Iowa State; N.D. Peacock (Emeritus), Ph.D. Michigan State; D.B. Williams, Ph.D. Pennsylvania State.

Associate Professors:

Sue Wilson, M.S., Ohio State.

Instructors:

Garry Menendez, M.S., University of Tennessee; Sue Wilson, M.S., Ohio State.

The department of Ornamental Horticulture and Landscape Design (OHLH) of the University of Tennessee provides quality academic instruction to undergraduate and graduate students. The department is staffed by experienced instructors who are committed to the success of their students. OHLH advisors give students advice in the selection of career specialties, elective courses, and provide serious students the best education possible. Professors want their students to be successful and enjoy positive student-teacher relationships. They keep track of job openings and offer students solid, candid advice during the job selection process. Since most OHLH teachers are also research scientists, undergraduate students interested in advanced studies are directed into appropriate courses necessary for admission to graduate school. Students are also encouraged to work with faculty researchers in a variety of laboratory, greenhouse or field experiments. The OHLH curriculum is organized into three different concentrations: technology, business and science. Each concentration offers a different academic approach to address the breadth of vocational opportunities available to OHLH undergraduate students. Major study areas are landscape design, floriculture, turfgrass management, landscape construction and contracting, wholesale nursery production and retail garden center management. A minimum of 132 credit hours including Internship is required for each concentration. Full-time summer internships are available at selected local, regional, and national companies or institutions. Part-time summer or semester internships are available from OHLH, other university departments and laboratories and local commercial firms.

The Technology Concentration allows greater flexibility for the development of course work best suited for individual requirements. For example, students interested in the traditional OHLH courses of study listed below should work closely with academic advisors in choosing those courses most applicable to specific needs. Students are encouraged to secure required internship training early and seeks additional training.

The Business Concentration is a comprehensive program directed to students seriously interested in competing for top OHLH jobs on a regional or national level. It provides an advantage for graduates entering the job market and is fundamental to those interested in starting their own companies. Students receive a minor in business administration allowing easier access to management positions as well as graduate programs such as the Masters of Business Administration (MBA) should they want to continue their education in the future.

The Science Concentration is intended for students interested in graduate studies leading to professional careers in cultural and associated agricultural or biological sciences. The required courses of study is sufficient for acceptance into most graduate programs but additional courses may be needed depending on an individual’s particular career focus. The required senior project (OHLH 493) and Internship (OHLH 492) enhance technical skills and provide practical training.

TRADITIONAL OHLH CAREER SPECIALTIES

LANDSCAPE DESIGN

Landscape designers create aesthetic concepts and practical plans for improved outdoor living. OHLH students study fundamental and advanced landscape design, landscape design graphics, computer aided landscape design, surveying, art, socio-economic impact of plants, field botany, professional practices, basic woody plant identification, landscape construction and maintenance methods, etc. The development of comprehensive design projects helps students prepare for careers in landscape design or advanced studies in landscape architecture. Graduates in design have access to a large segment of the OHLH community area of employment. Job opportunities include landscape designer or sales manager for landscape design/build firms, retail nurseries and garden centers; landscape maintenance and interior-scaping firms; landscape designer, architect or planner for city, county, and government horticultural or related facilities, college or university teacher, etc.

FLORICULTURE

Floriculture is the field of growing, marketing and designing with flowers and plants. Students with interests in crop production, a talent for business management or abilities in artistic design and communication will find satisfying careers in the field of floriculture. Students study controlled environments, floriculture production, plant identification, business management, greenhouse engineering, marketing, post-harvest physiology, plant pathology, and interior plant maintenance and design. A scientific approach to regulating plant growth as well as practical intern training is emphasized. The job market includes occupations thought of as part of floriculture, such as greenhouse production and floral design and sales.
as well as newer occupations in the field, such as horticultural therapy, brokering and commentating. Positions available in the floriculture industry include retail florist owner/manager, salesperson, floral designer, delivery personnel, interior landscaping and maintenance personnel, cut flower processors, wholesale florist/broker, flower buyer, greenhouse grower/crop manager, crop production supervisor, marketing manager, greenhouse maintenance foreman, college or university teacher, research scientist, technician, etc.

**TURFGRASS MANAGEMENT**

Turfgrass management students receive academic and hands-on instruction in the science of growing and managing turfgrasses used for golf courses, parks, athletic fields, residential lawns, and commercial areas. Students study turfgrass management, insect and disease control, plant pathology, golf course design, irrigation systems, small internal combustion engines, scientific and practical cultural techniques, etc. Extensive on-the-job training with recommended commercial companies is emphasized. Job titles include golf course superintendent and assistant superintendent, grounds superintendent, lawn service company manager, foreman, turf chemical company sales representative, research scientist or technician, landscape manager for private, county, state or government facilities or institutions such as schools, colleges, universities; university research scientist or teacher, etc.

**LANDSCAPE CONSTRUCTION AND CONTRACTING**

The landscape construction and contracting industry installs residential and commercial landscapes on a local, regional and national scale. Students study basic woody plant ID, turfgrass management, basic landscape construction practices, grounds maintenance, specially landscape construction, professional practices, etc. They learn construction materials, building and installation methods for decks, garden pools, waterfalls, patios, walks, outdoor lighting, etc. Hands-on training in outdoor, on-the-job situations is emphasized. Extensive intern training with commercial companies is encouraged. Job titles include landscape designer, landscape architect, landscape construction and contracting manager, sales manager, sales manager, salesperson, superintendent of operations, construction and landscape superintendent, crew foreman, mechanic, laborer, superintendent of operations, etc.

**WHOLESALE NURSERY PRODUCTION**

The wholesale nursery industry is the production of trees, shrubs, and other ornamental plants used in residential and commercial landscaping and garden center retail sales. Marketing is usually on a regional or national scale. Students learn nursery crop production and marketing with special emphasis on sound business and labor management practices. Students study basic landscape plants, greenhouse production and management, plant propagation, turf management, landscape construction, nursery management and production, plant pathology, economic entomology, small internal combustion engines, agricultural chemical application techniques, etc. Extensive intern training with selected regional and national companies is encouraged. Job titles include plant propagator, grower, inventory controller, shipping superintendent, field superintendent, customer services manager, credit manager, shipping manager, irrigation manager, inventory and quality control specialist, traffic supervisor, advertising and catalog production, salesman, regional marketing manager, traffic manager, broker, etc.

**GARDEN CENTER AND RETAIL NURSERY MANAGEMENT**

Garden Centers and retail nurseries are the primary sources of nursery products sold to the general public. They sell numerous gardening products intended for homeowners including landscape shrubs and trees, annuals and perennials, tropicals, bulbs, flowers, fertilizers, chemicals, garden and lawn tools, power equipment, etc. Retail nurseries may offer landscape and interioredoring services, lawn maintenance, pool and garden specialty services, wholesale production and sales of specialty plants such as hanging baskets, wild flowers, vegetable and garden herbs, ornamental tropical fish, etc. Students study basic landscape plants, marketing, field botany, interior plants, fundamentals of landscape design, turfgrass management, etc. They learn basic management principles, pricing and mark-up methods, nursery marketing, labor managing and hiring practices, etc. Job titles include store manager, landscape manager, production manager, retail market grower, salesperson, landscape salesperson, buyer, landscape designer, landscape architect, plant diagnostician, etc.

**OTHER SPECIALTY AREAS**

Other OHLD vocational areas are: landscape maintenance, interior plantscaping, arboriculture and botanical garden, wholesale nursery products distributor, nursery products broker, wholesale florist, retail florist, horticulture therapy, plant inspector, etc.

A minor in Ornamental Horticulture and Landscape Design shall consist of 18 hours of courses in Ornamental Horticulture and Landscape Design. Three of the following four courses must be included: 210, 310, 330, 340. Any of the following may be taken as part of the nine additional hours: 210, 220, 230, 320, 350, 370, 380, 410, 440, 450, 460, 480, 490, 493. This minor, to these courses will be waived, but must be included in addition to the total of 18 hours.

**TECHNOLOGY CONCENTRATION**

**Plant Pathology 313 or 321, Plant and Soil Science 311, 334 or 433**

**Economics Elective**

**History Elective**

**Unrestricted Electives**

**Writing or Speech Elective**

**Senior**

*Select 1 from OHLD 410, 440, 450, 451, 460, 480, 485, or 493*

**OHLD 490**

*Select 1 from Ag Econ Elect, Ag En Tech 432, 433, 434, 435, 436*

*Select 1 from Botany 305, 321, or 330*

**Humanties Elective**

**Unrestricted electives**

Total: 12 hours

**BUSINESS CONCENTRATION**

**Freshman**

**OHLD 110**

**Agriculture 101**

**Botany 110, 120**

**Chemistry 100-110 or 120-130**

**English 101, 102**

**Math 119-121 or 121-122 or 141-142**

**Sophomore**

**Select 2 from OHLD 220, 230, or 280**

**Math 119-121 or 121-122 or 141-142**

**Economics 201**

**Select 2 from Botany 305, 321, or 330**

**Humanties Elective**

**Unrestricted Electives**

**Junior**

**Select 4-5 from OHLD 310, 320, 330, 340, 350, 360, 370 or 380**

**OHLD 492**

**Finance 301**

**Marketing 301**

**Select 2 from Botany 330, Entomology & Plant Path 313 or 321**

**Writing or Speech Elective**

**Unrestricted Electives**

**Senior**

**Select 3 from OHLD 410, 440, 450, 460, 480 or 492**

**OHLD 490**

**Business Electives**

**History Elective**

**Humanties Elective**

**Unrestricted Electives**

Total: 132 hours

*General Biology 110, 120 may substitute for Botany only if taken before entering Ornamental Horticulture and Landscape Design.

*Courses are selected in conference with academic advisor.

*Lists of appropriate courses for these electives are available at the OHLD office.

**SCIENCE CONCENTRATION**

**Freshman**

**Agriculture 101**

**Botany 110 or Biology 110-120**

**Chemistry 120-130**

**Botany 110, 120**

**Chemistry 100-110 or 120-130**

**English 101, 102**

**Math 119-121 or 121-122 or 141-142**

**Sophomore**

**Select 2 from OHLD 220, 230, or 280**

**Math 119-121 or 121-122 or 141-142**

**Economics 201**

**Select 2 from Botany 305, 321, or 330**

**Humanties Elective**

**Unrestricted Electives**

**Junior**

**Select 4-5 from OHLD 310, 320, 330, 340, 350, 360, 370 or 380**

**OHLD 492**

**Finance 301**

**Marketing 301**

**Select 2 from Botany 330, Entomology & Plant Path 313 or 321**

**Writing or Speech Elective**

**Unrestricted Electives**

**Senior**

**Select 3 from OHLD 410, 440, 450, 460, 480 or 492**

**OHLD 490**

**Business Electives**

**History Elective**

**Humanties Elective**

**Unrestricted Electives**

Total: 132 hours

*General Biology 110, 120 may substitute for Botany only if taken before entering Ornamental Horticulture and Landscape Design.

*Courses are selected in conference with academic advisor.

*Lists of appropriate courses for these electives are available at the OHLD office.

*Courses should be selected in conference with academic advisor.

NOTE: Students completing the above business courses qualify for a minor in Business Administration.
The Environmental Science and Natural Resources concentration will give students a background (both field and laboratory) in various ecosystems and acquaint them with problems associated with the management of natural resources. This program is designed to train students to address environmental problems such as soil and water pollution, land use, and waste disposal. Graduates in this concentration would be trained to work in private industry, on their own as concerned citizens, and in governmental agencies such as the Environmental Protection Agency, State Health Departments, Soil Conservation Service, and the Cooperative Extension Service to control, remEDIATE, and regulate environmental problems.

**Total: 132 hours**

1. Students with a Mathematics ACT of 26 or more or a satisfactory placement test score should take Mathematics 151-152 or 141-142.

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**PLANT AND SOIL SCIENCE**

**Professors:**

J.E. Foss (Head), Ph.D. Minnesota; F.L. Allen, Ph.D. Minnesota; F.F. Bell (Emeritus), Ph.D. Iowa State; M. D. Mullen, Ph.D. North Carolina State; L. F. Seatz (Emeritus), Ph.D. Wisconsin; C. E. Sams, Ph.D. Michigan State; W. L. Parks (Emeritus), Ph.D. Purdue; J. H. Swingle (Emeritus), Ph.D. Michigan State; L. N. Skold (Emeritus), Ph.D. North Carolina State; A. R. Reynolds, Ph.D. Wisconsin; M. J. Mueller, Ph.D. Georgia; M. D. Mullen, Ph.D. North Carolina State; G. V. Wilson, Ph.D. Arkansas.

**Associate Professors:**


**Assistant Professors:**

M.E. Essington, Ph.D. California (Riverside); T.C. Mueller, Ph.D. Georgia; M.D. Mullen, Ph.D. North Carolina State; G. V. Wilson, Ph.D. Arkansas.

**Advisors:**

Allen, Coffey, Foss, Lessman, Mullen, Reich, and Reynolds.

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**List of appropriate courses for these electives are available in the OHLD office.**

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**List of approved courses in the humanities and social sciences available from the Department of Plant and Soil Science.**

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**List of technical electives available from the student's academic advisor.**

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**Course and Required Credit Hours**

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<thead>
<tr>
<th>Course</th>
<th>Department</th>
<th>Credit Hours</th>
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<tr>
<td>English 101-102</td>
<td>Agriculture</td>
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<td>Math 121-122 or 141-142 or 151-152</td>
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<td>OHL 492</td>
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<td>History Elective</td>
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<td><em>Unrestricted Elective</em></td>
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Total: 132 hours