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 administrative units—the Agricultural Experiment Station and the Agricultural Extension Service—were organized and assigned responsibility for research and extension functions, 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 their work is 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 College provides curricula leading to the degrees of Bachelor of Science in Agriculture, Bachelor of Science in Biosystemic 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 Biosystemic Engineering receives strong support from the College of Engineering and is fully accredited by the Accreditation Board of Engineering and Technology. The forest resources management and wildlife 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 science, forest, land-use, 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 the major curriculum should be made in consultation with the guidance of the faculty advisor.

Students pursuing a program leading to the degree of Bachelor of Science in Biosystemic Engineering may select the concentration offered in agricultural engineering, biological engineering or food engineering. Students seeking the Bachelor of Science in Forestry may choose concentrations in forest resources management or wildlife recreation. 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 or 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 16 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 the 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.

CURRICULA IN AGRICULTURE

The College provides curricula leading to the degrees of Bachelor of Science in Agriculture, Bachelor of Science in Biosystemic 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 Biosystemic Engineering receives strong support from the College of Engineering and is fully accredited by the Accreditation Board of Engineering and Technology. The forest resources management and wildlife recreation concentrations are fully accredited by the Society of American Foresters.

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agricultural economics, biosystems engineering, food technology and science, and plant and soil science.

General requirements and policies of the Graduate School of The University of Tennessee apply to these programs and are described in the Graduate Catalog.

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, McLoud Food Technology Building, C.E. Brant 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 provides 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), Chisolm Farm (500 acres), Plant Sciences Farm (1,212 acres), and a livestock farm (510 acres) provide excellent field laboratory facilities for instructional programs offered in the College. Cherokee Woodlot (1,000 acres), the Oak Ridge Forest (2,260 acres), and Anea Plantation (15,900 acres of forestland) provide activities in forestry, wildlife, and fisheries.

Transportation by bus, rail, and road to facilities of agricultural students from the agricultural campus to the University Farm 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 undue inconvenience.

The facilities of the University on the main campus are available to agricultural students. Courses in the arts and sciences, engineering, communications, etc. are offered to agricultural students and these students are taught on the main University campus.

SELECTION OF CURRICULUM

Agricultural students who have determined their area of specialization may choose the curriculum most adaptable to their needs when they register as freshmen, and 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 advisors of each 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 138 hours credit for graduation.

OPTIONAL MINORS

Agricultural students may have one or more minors in agriculture or in other colleges offered 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 14 credit hours in courses numbered 200 and above and 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 for each department offering a minor. Majors 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

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

- Agriculture and Renewable Natural Resources Requirement
- Biological Sciences (College of Agricultural Sciences and Natural Resources courses (outside of the major department) designated by the department and/or electives (38))
- 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) (6)
- Social Sciences and Humanities (Including Economics (4) and electives (12)
- Economics (4)
- Electives (18)
- Required Electives (6)
- 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 advisor (electives 36)

For a total of 132 hours.

Bachelor of Science in Biosystems Engineering

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

Bachelor of Science in Agricultural Engineering

Bachelor of Science in Forestry program excepted.

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 an individual. Students gain experience and are encouraged to assume responsibility not available in formally organized courses. Association with students and faculty from all phases of agriculture and the renewable natural resource fields is encouraged. With 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 examination should be submitted for consideration during the first semester of study in the selected curriculum.

AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

Professors:

B.M. Badenhop (Emertius), Ph.D. Purdue; J.B. Brooker, Ph.D. Florida; C.L. Coblentz, Ph.D. Emertius; D. Eastwood, B.S. T.C. English, Ph.D. Iowa State; J.H. Ketter, Emertius; P.D. Kuchinsky, Ph.D. Florida; J.A. Larson, Ph.D. Minnesota; G.K. Minter, Ph.D. Minnesota; D.L. McLemore, Ph.D. Clemson; B.R. McManus (Emertius); P.M. Puckett, Ph.D. Emertius; R.D. Ray, Ph.D. Emertius; J.S. Riven, Ph.D. Emertius; B.M. Roberts, Ph.D. Iowa State; D.B. Sappington (Emeritus), Ph.D. Iowa State; T.J. White, Ph.D. Emertius; H. Wilt, Ph.D. Emertius; H. Wilt, Ph.D. Emertius; H. Wilt, Ph.D. Emertius; H. Wilt, Ph.D. Emertius.

Associate Professors:

P.M. Blasing, Ph.D. North Carolina State; K.L. Jensen, Ph.D. Oklahoma State; G.K. Pompalli, Ph.D. California (Davis).

Assistant Professors:

A.C. Eckenrode, Ph.D. Pennsylvania State; J.A. Larson, Ph.D. Oklahoma State.
AGRICULTURAL ECONOMICS AND BUSINESS CURRICULUM

Advisors:
Professors: Brooker, McLemore, Mundy and Perk.

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 major agencies of agricultural business. Employment opportunities include work in marketing of agricultural products, agribusiness firm management, agribusiness 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, country agricultural agents, managers of farm supply and purchasing firms, agricultural journalists, and farm loan officers. The curriculum also provides the necessary background for graduate work in agricultural economics.

Minor consists of 15 credit hours including:
- Economics 201, Agricultural Economics 342, 380, 412, and 2 or 3 elective in Agricultural Economics.

<table>
<thead>
<tr>
<th>Hours Credit</th>
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</thead>
<tbody>
<tr>
<td>Agriculture 101</td>
</tr>
<tr>
<td>Biological Science elective</td>
</tr>
<tr>
<td>Mathematics 122, 123</td>
</tr>
<tr>
<td>English 101, 102</td>
</tr>
<tr>
<td>Humanities elective</td>
</tr>
<tr>
<td>History elective</td>
</tr>
<tr>
<td>Total:</td>
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</tbody>
</table>

Sophomore

<table>
<thead>
<tr>
<th>Hours Credit</th>
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</thead>
<tbody>
<tr>
<td>Economics 201</td>
</tr>
<tr>
<td>Agricultural Science electives</td>
</tr>
<tr>
<td>Speech 101 or 102</td>
</tr>
<tr>
<td>Accounting 201, 202</td>
</tr>
<tr>
<td>Animal Science 260 or 381</td>
</tr>
<tr>
<td>Plant and Soil Science 260 or 280</td>
</tr>
<tr>
<td>Statistics 201</td>
</tr>
<tr>
<td>Total:</td>
</tr>
</tbody>
</table>

Junior

<table>
<thead>
<tr>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural Resource 380</td>
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<tr>
<td>Economics 313</td>
</tr>
<tr>
<td>Statistics 300</td>
</tr>
<tr>
<td>Animal Science 300, 340, 350, 412</td>
</tr>
<tr>
<td>Plant and Soil Science 300, 320, 340</td>
</tr>
<tr>
<td>English 290</td>
</tr>
<tr>
<td>Total:</td>
</tr>
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</table>

Senior

<table>
<thead>
<tr>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture 419</td>
</tr>
<tr>
<td>Agricultural Economics or Economics elective</td>
</tr>
<tr>
<td>Business elective</td>
</tr>
<tr>
<td>Integrative Studies or Humanities elective</td>
</tr>
<tr>
<td>Electives</td>
</tr>
</tbody>
</table>

Total: 132 hours

Agricultural and Business Education

Professors:


Associate Professor:

R.G. Waters, Ph.D. Penn State.

The Department of Agricultural and Extension Education has two emphases: namely, Agricultural Extension Education and Agricultural Education.

AGRICULTURAL EXTENSION EDUCATION

Although the 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 Agricultural Extension Service, and to provide prospective Extension employees with work experience in selected training courses.

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 providing students to teach agricultural education and 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 areas. 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 agricultural education content hours equivalent to the number of hours of student teaching received in the teacher education option. With advisor approval additional technical education areas specifically for certification, may be substituted for courses in the 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, agricultural business, government agencies, and farming and ranching. This option permits students to prepare for a student to meet teacher certification requirements.

<table>
<thead>
<tr>
<th>Hours Credit</th>
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</thead>
<tbody>
<tr>
<td>Freshman</td>
</tr>
<tr>
<td>Agriculture 101</td>
</tr>
<tr>
<td>Biology 101, 102</td>
</tr>
<tr>
<td>English 101, 102</td>
</tr>
<tr>
<td>Mathematics 119, 123</td>
</tr>
<tr>
<td>Economics 201</td>
</tr>
<tr>
<td>Animal Science 260 or 280</td>
</tr>
<tr>
<td>Computer Science elective</td>
</tr>
<tr>
<td>Sociology 110</td>
</tr>
<tr>
<td>Speech 201</td>
</tr>
<tr>
<td>Human Service elective</td>
</tr>
<tr>
<td>Horticulture elective</td>
</tr>
<tr>
<td>Agriculture 210</td>
</tr>
<tr>
<td>Plant and Soil Science 210</td>
</tr>
<tr>
<td>Plant and Soil Science 211</td>
</tr>
<tr>
<td>Animal Science 290</td>
</tr>
<tr>
<td>Agricultural Technology 260</td>
</tr>
<tr>
<td>Physical Science elective</td>
</tr>
<tr>
<td>Agricultural and Extension Education 201</td>
</tr>
<tr>
<td>Junior</td>
</tr>
<tr>
<td>Economics and Plant Pathology 230</td>
</tr>
<tr>
<td>Animal Science 300</td>
</tr>
<tr>
<td>Animal Behavior 305</td>
</tr>
<tr>
<td>CHIL 310</td>
</tr>
<tr>
<td>Agriculture Education 434, 436</td>
</tr>
<tr>
<td>Agriculture 342</td>
</tr>
<tr>
<td>Educational Psychology 349</td>
</tr>
<tr>
<td>Education 401</td>
</tr>
<tr>
<td>Human Services</td>
</tr>
<tr>
<td>Senior</td>
</tr>
<tr>
<td>Agriculture Education 435, 436</td>
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<tr>
<td>Agriculture Education 420</td>
</tr>
<tr>
<td>Agriculture Engineering Technology 402</td>
</tr>
<tr>
<td>Animal Science 481</td>
</tr>
<tr>
<td>Humanities electives</td>
</tr>
<tr>
<td>General elective</td>
</tr>
<tr>
<td>Agriculture electives</td>
</tr>
</tbody>
</table>

Total: 132 hours

The course should contain a writing component. Selected from ornamental horticulture, fruits or vegetables. Equivalent may be substituted for students not seeking teacher certification.

AGRICULTURAL AND BIOSYSTEMS ENGINEERING

Professors:


Associate Professors:

R.S. Field (Emeritus), Ph.D. Tennessee, P.E.; W.E. Harg, Ph.D. Purdue, J.B. Willenstedt, Ph.D. Purdue, D.C. Yoder, Ph.D. Purdue, R.E. Yoder, Ph.D. Colorado State, P.E.

Assistant Professors:

G. Hubert, Ph.D. Bivox, P.E.; D.R. Raman, Raman, Cornell, R.R. Womac, Ph.D. Tennessee, P.E.

Advisors:


The College of Agricultural Sciences and Natural Resources, with the cooperation of the College of Engineering, offers a four-year curriculum leading to the degree of Bachelor of Science in Biosystems Engineering. The curriculum is accredited by the Engineering Accreditation Commission of the Accreditation

Fishman

<table>
<thead>
<tr>
<th>Hours Credit</th>
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</thead>
<tbody>
<tr>
<td>Agriculture 101</td>
</tr>
<tr>
<td>Biology 101, 102</td>
</tr>
<tr>
<td>English 101, 102</td>
</tr>
<tr>
<td>Mathematics 119, 123</td>
</tr>
<tr>
<td>Economics 201</td>
</tr>
<tr>
<td>Animal Science 260 or 280</td>
</tr>
</tbody>
</table>

Total: 129 hours

Selected from Biology 101, 102, 136, 140. See advisor for list of acceptable courses.

Selected from Chemistry 101-125 or 125-135 (excluding 101-102 or 103, Physics 121-122.)
## Course Requirements

### Freshman

<table>
<thead>
<tr>
<th>Course Area</th>
<th>Course Title</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology</td>
<td>Basic Biology 101, 111, 121, 131</td>
<td>12</td>
</tr>
<tr>
<td>Engineering</td>
<td>Biosystems Engineering 103</td>
<td>4</td>
</tr>
<tr>
<td>Chemistry</td>
<td>Chemistry 101</td>
<td>4</td>
</tr>
<tr>
<td>Math</td>
<td>English 101, 102</td>
<td>4</td>
</tr>
<tr>
<td>Social Science</td>
<td>Social Science Elective</td>
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</tbody>
</table>

**Total: 134 hours**

### Sophomore

<table>
<thead>
<tr>
<th>Course Area</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>Mathematics</td>
<td>Mathematics 141, 142</td>
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</tr>
<tr>
<td>Engineering</td>
<td>Biosystems Engineering 201</td>
<td>4</td>
</tr>
<tr>
<td>Social Science</td>
<td>Human Values Elective</td>
<td>1</td>
</tr>
<tr>
<td>Chemistry</td>
<td>Chemistry 130</td>
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</tr>
<tr>
<td>Math</td>
<td>Mathematics 200, 231, 241</td>
<td>8</td>
</tr>
<tr>
<td>Social Science</td>
<td>Speech 110</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total: 134 hours**

### Junior

<table>
<thead>
<tr>
<th>Course Area</th>
<th>Course Title</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>Biosystems Engineering 311, 321, 331, 341</td>
<td>9</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>Electrical Engineering 311</td>
<td>3</td>
</tr>
<tr>
<td>Math</td>
<td>Mathematics 241</td>
<td>3</td>
</tr>
<tr>
<td>Social Science</td>
<td>Social Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>Mechanical Engineering 311, 331</td>
<td>6</td>
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</tbody>
</table>

**Total: 134 hours**

### Senior

<table>
<thead>
<tr>
<th>Course Area</th>
<th>Course Title</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>Biosystems Engineering 401, 402</td>
<td>4</td>
</tr>
<tr>
<td>Engineering</td>
<td>Biosystems Engineering 403, or 430 or 433</td>
<td>3</td>
</tr>
<tr>
<td>Business Elective</td>
<td>Business Elective</td>
<td>3</td>
</tr>
<tr>
<td>Math</td>
<td>English 360</td>
<td>3</td>
</tr>
<tr>
<td>Social Science</td>
<td>Social Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>Mechanical Engineering 311</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total: 134 hours**

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### BIOSYSTEMS ENGINEERING WITH CONCENTRATION IN AGRICULTURAL ENGINEERING

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Agriculture</td>
<td>Basic Agriculture 101, 111, 121, 131</td>
<td>12</td>
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<td>Engineering</td>
<td>Biosystems Engineering 103</td>
<td>4</td>
</tr>
<tr>
<td>Chemistry</td>
<td>Chemistry 101</td>
<td>4</td>
</tr>
<tr>
<td>Math</td>
<td>Math 101, 102</td>
<td>6</td>
</tr>
<tr>
<td>Social Science</td>
<td>Social Science Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total: 134 hours**

### BIOSYSTEMS ENGINEERING WITH CONCENTRATION IN BIOLOGICAL ENGINEERING

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<thead>
<tr>
<th>Course Area</th>
<th>Course Title</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology</td>
<td>Basic Biology 101, 111, 121, 131</td>
<td>12</td>
</tr>
<tr>
<td>Engineering</td>
<td>Biosystems Engineering 103, 104</td>
<td>6</td>
</tr>
<tr>
<td>Chemistry</td>
<td>Chemistry 101</td>
<td>4</td>
</tr>
<tr>
<td>Math</td>
<td>English 101, 102</td>
<td>6</td>
</tr>
<tr>
<td>Social Science</td>
<td>Social Science Elective</td>
<td>3</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>Mechanical Engineering 311</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total: 134 hours**

### BIOSYSTEMS ENGINEERING WITH CONCENTRATION IN FOOD ENGINEERING

<table>
<thead>
<tr>
<th>Course Area</th>
<th>Course Title</th>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science</td>
<td>Basic Science 101, 111, 121, 131</td>
<td>12</td>
</tr>
<tr>
<td>Engineering</td>
<td>Biosystems Engineering 103, 104</td>
<td>6</td>
</tr>
<tr>
<td>Chemistry</td>
<td>Chemistry 101</td>
<td>4</td>
</tr>
<tr>
<td>Math</td>
<td>English 101, 102</td>
<td>6</td>
</tr>
<tr>
<td>Social Science</td>
<td>Social Science Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total: 134 hours**
ANIMAL SCIENCE WITH CONCENTRATION IN PRODUCTION/MANAGEMENT

<table>
<thead>
<tr>
<th>Hours Credit</th>
<th>Freshman</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture 101</td>
<td>3</td>
</tr>
<tr>
<td>Biology 100-102</td>
<td>6</td>
</tr>
<tr>
<td>Mathematics 101-102 or 141-142</td>
<td>6-8</td>
</tr>
<tr>
<td>Physical Science and Math Restricted Electives</td>
<td>8</td>
</tr>
<tr>
<td>Non-AnimalScience Agriculture Electives</td>
<td>6-7</td>
</tr>
<tr>
<td>Animal Science 220, 260</td>
<td>6</td>
</tr>
<tr>
<td>Speech 210 or 240</td>
<td>3</td>
</tr>
<tr>
<td>Total: 132 hours</td>
<td></td>
</tr>
</tbody>
</table>
Electives allow students to select an area for specialization. Those interested in production management would select additional courses in agriculture; in business administration, economics, agricultural economics, finance, and accounting, in science/technology in chemistry, zoology, physics, and statistics, etc. Electives should be chosen to receive objectives in mind and in consultation with the advisor. The animal science core curriculum course are 220, 280, 320, 330, 340, and 390.

**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.
2. English Comp. 101-102 (3,3) - 6 hours
3. Humanities and Social Sciences - 18 hours
4. Elements of Physics 221-222 (4,4) - 8 hours
5. General Chemistry 120-130 (4,4) - 8 hours
6. Organic Chemistry 350-360 and Laboratory 389 (3,3,2) - 8 hours
7. Cell and Comparative Biochemistry 410 (4) - 4 hours
8. General Biology 130-140 (4,4) - 8 hours
9. Biology 240 - 4 hours
10. Biology Elective - 2 or 3 hours
11. The last 30 hours of the three-year pre-veterinary curriculum must have been taken at UT Knoxville.
12. At least 12 hours of upper division (300 and 400 level) courses must be taken at UT Knoxville.

In addition to the required pre-veterinary medical courses, the following (or approved equivalents) must be completed before entering the College of Veterinary Medicine.

- Mathematics 125-125 or 141-152 or 151-152
- Animal Science 101 - 1 hour
- Agriculture 101 - 3 hours
- Animal Science 220 - 3 hours
- Animal Science 320 - 3 hours
- Animal Science 330 - 3 hours
- Animal Science 340 - 3 hours
- Animal Science 380 - 3 hours
- One course from Animal Science 481, 495 or 500
- Computer Science Elective - 3 hours
- Speech 210 or 240 - 3 hours

**FOOD SCIENCE AND TECHNOLOGY**

C.J. Brekes (Hoed), Ph.D., Wisconsin
- Cell and Comparative Biochemistry 410 (4) - 4 hours
- General Biology 130-140 (4,4) - 8 hours
- Biology Elective - 2 or 3 hours
- The last 30 hours of the three-year pre-veterinary curriculum must have been taken at UT Knoxville.

In addition to the required pre-veterinary medical courses, the following (or approved equivalents) must be completed before entering the College of Veterinary Medicine.

- Mathematics 125-125 or 141-152 or 151-152
- Animal Science 101 - 1 hour
- Agriculture 101 - 3 hours
- Animal Science 220 - 3 hours
- Animal Science 320 - 3 hours
- Animal Science 330 - 3 hours
- Animal Science 340 - 3 hours
- Animal Science 380 - 3 hours
- One course from Animal Science 481, 495 or 500
- Computer Science Elective - 3 hours
- 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 Human/Bio/Social Science category. The remainder must be a Social Science elective, a Humanities elective, and a Humanities elective in a writing intensive. Writing intensive History courses may also be used.

- Non-Animal Science Agriculture - 6 hours
- Satisfactory completion of the first two semesters in the CVM professional program, or one semester prior to December 31 of the student's first year in the CVM (should contact the Animal Science Department in order to check on graduation procedures for this program). 7. A total of 130 hours must be completed by the end of the first year in the CVM.

<table>
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<tr>
<th>Hours Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
</tr>
<tr>
<td>Agriculture 101</td>
</tr>
<tr>
<td>Animal Science 101</td>
</tr>
<tr>
<td>English 101, 102</td>
</tr>
<tr>
<td>Mathematics 125-125 or 141-142 or 151-152</td>
</tr>
<tr>
<td>Chemistry 120-130</td>
</tr>
<tr>
<td>Sophomore</td>
</tr>
<tr>
<td>Biology 240 or Animal Science 340</td>
</tr>
<tr>
<td>Biology Elective</td>
</tr>
<tr>
<td>Computer Science or Agriculture 280</td>
</tr>
<tr>
<td>Speech 210 or 240</td>
</tr>
<tr>
<td>Chemistry 389, 380-382</td>
</tr>
<tr>
<td>Physics 210, 220</td>
</tr>
<tr>
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</tr>
<tr>
<td>Human/Animal Elective</td>
</tr>
<tr>
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</tr>
<tr>
<td>Total: 99-101 hours</td>
</tr>
</tbody>
</table>

- Chosen from approved list of courses meeting University requirements as Social Sciences.
- Will count toward the 18 credits required in the Humanities/Social Science for entrance into the CVM.
- Chosen from approved list of courses meeting University requirements as Humanities and described as writing intensive.

* This curriculum meets the requirements for entrance to the CVM and after the first successful year in the CVM, the student will be awarded a B.S. in Agriculture with a major in Animal Science. Should the student not gain admittance to the CVM after the Junior year, the student would complete the requirements for a major in Animal Science during the Senior year.

**FOOD SCIENCE AND TECHNOLOGY**

C.J. Brekes (Hoed), Ph.D., Wisconsin
- Cell and Comparative Biochemistry 410 (4) - 4 hours
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* This curriculum meets the requirements for entrance to the CVM and after the first successful year in the CVM, the student will be awarded a B.S. in Agriculture with a major in Animal Science. Should the student not gain admittance to the CVM after the Junior year, the student would complete the requirements for a major in Animal Science during the Senior year.
Applications who are not accepted into the program and who believe that extenuating circumstances prevented their acceptance into the program may appeal the decision to a faculty committee (i.e., S.U.C.). A written statement in which the case is made for acceptance is required for all applicants. It would have to be submitted within one week of the initial rejection notice.

Applicants receiving a positive response from the appeals committee will be accepted into the program on a provisional basis through the first semester of their Junior year. The progress of provisional students will be reviewed at the end of the Fall Semester; at that time they will either be fully admitted or released from the program.

CORE COURSES

Forestry Majors: two courses in English composition (English 101 and 102 or equivalent); college algebra and calculus (Math 119 and 125 or equivalent); general economics (Economics 201 or equivalent); public speaking (Speech 210 or 240 or equivalent); and statistics (Statistics 201 or equivalent); basic science (PS 210 or equivalent); introduction to microcomputers (Ag 269 or equivalent); general biology (Biology 230 or equivalent).

Wildlife and Fisheries Science Majors: two courses in English composition (English 101 and 102 or equivalent); college algebra and calculus (Math 119 and 125 or equivalent); two courses in chemistry (Biology 110 and 110 or equivalent); two courses in general biology (Biology 130 and 140 or equivalent); general economics (Economics 201 or equivalent); general social sciences (Psychology 110 or equivalent); and Statistics 201 or equivalent.

All students must have completed all but 3 core courses before entering upper division courses. They will need and be encouraged to take additional courses.

FOREST MANAGEMENT

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. Foresters are managers of these resources. Thus, our principal or functional objective is to provide the broad education needed to deal effectively with the complex of forest resources.

A minor in Forestry consists of 16 credit hours as follows:

FWF 211 or 250, FWF 213, 311, and 310 and 110 from FWF 100, 313, 312, 315, and 317.

Electives

Total: 35 hours

Wildland Recreation Concentration

The Wildland Recreation Concentration is an interdisciplinary degree that prepares students to work in natural resource-based recreation settings on public and private lands, including...
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. Main

Students prepare for professional positions in the planning, development, interpretation, and management of natural resources and public lands for recreational purposes. Students also learn the basic philosophy and principles associated with the use of leisure time and the relationship of leisure time to the environment. Elective credits may be obtained in complementary areas such as education, cultural and natural history inter-

The OHLD curriculum is organized into

Total: 133 hours

Elective courses which are chosen in conference with advisor. Students will choose one course from Philosophy 110, 120, 220, 230 or 270 or Social/Family Studies or Urban Studies 201 or 202 or 203 or 204.

Total: 12 credits

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. Main fields include aesthetic, economic, or ecological. Success depends upon wildlife and fisheries biologists providing assistance; scholar-

Hours Credit

Freshman

English 101, 102..................................................6
Mathematics 119, 125...........................................6
Mathematics 119, 125...........................................6
Botany 110, 120 ...................................................8

Tennis, baseball, softball, and other similar activities. Students are encouraged to work with faculty researchers in a variety of labora-

Gresshoff, Ph.D. Australian National Univ.; E.T. Graham, Ph.D. Washington State; H. Samples, Ph.D., Oklahoma State, Associate Professor; L.M. Callahan, Ph.D. Rutgers; G. Callahan, Ph.D. Ohio State (Head); J.M. Griner, Ph.D. Rhode Island. It is very important to consult our website at: hort.ohio-state.edu QHLD CAREER SPECIALITIES

The Department of Ornamental Horticulture and Landscape Design (OHLD) of the Univer-

Facts and Figures for Ohio Agricultural Department (OHLD) and other university depart-

Total: 132 hours

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. Main

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The OHLD curriculum is organized into

Total: 133 hours

Elective courses which are chosen in conference with advisor. Students will choose one course from Philosophy 110, 120, 220, 230 or 270 or Social/Family Studies or Urban Studies 201 or 202 or 203 or 204.
The Business Concentration is fundamental to those interested in starting their own companies. Students receive a minor in business administration allowing easier access to management track students as well as graduate programs such as the Master of Business Administration (MBA) students should want to continue their education in the future.

**Horticultural Science and Management Concentration**

The Horticulture Science and Management Concentration is designed for the student desiring to pursue areas such as turfgrass management, horticulture, nursery production, landscape contracting, recreation management, or soil science. General horticulture curriculums should be selected in conference with an academic advisor. Students interested in attending graduate school would be encouraged to complete a minor in their area of specialization.

**PUBLIC HORTICULTURE CONCENTRATION**

This two-semester General Biology series may be substituted for Botany only if taken before entering OHLD.

**BUSINESS CONCENTRATION**

The Business Concentration is fundamental to those interested in starting their own companies. Students receive a minor in business administration allowing easier access to management track students as well as graduate programs such as the Master of Business Administration (MBA) students should want to continue their education in the future.

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LANDSCAPE DESIGN CONCENTRATION

Landscape designers create aesthetic concepts and practical plans for improved outdoor living. OHLDS students study fundamental and advanced landscape design, landscape design graphics, computer aided landscape design, surveying, site, and socio-economic analysis of plants, field botany, professional practices, basic woody plant identification, landscape construction and maintenance methods. 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 OHLDS commodity areas of employment.

HOURS CREDITS

Freshman
OHLDS 110 3
Art 101-103 4
Biology 110-112 4
Chemistry 100-110 or 109-110 8
English 101-102 8
Math 119 and (123 or 125) 8
Sophomore
OHLDS 230, 260 6
Agriculture 200 or Computer Science 100 3
Technical Elective 3
Biology 350 4
Ecology 201 3
Plant & Soil Science 210 3
Biological Science Elective 3
Writing or Speech Elective 3
Humanities Elective 3
Junior
OHLDS 300, 390 3
Select 4 from OHLDS 310, 360, 370, 380, 381, 391, 400, 401 11-12
OHLDS 450 3
Botany 200 3
Technical Elective 3
Historical Studies Elective 3
Integrative Studies Elective 3
Senior
OHLDS 450, 460, 480, 481 11
OHLDS 490, 490 4
Elective 4
Integrative Studies Elective 3
Humanities Elective 3
Elective 3-4

Total: 132 hours

A two-semester General Biology series may be substituted for Botany only if taken before entering OHLDS.

SELECT ELECTIVE: All Electives are available that are appropriate. Students are encouraged to consult with academic advisor.

ELECTIVE LIST: ALL CONCENTRATIONS

INTEGRATIVE STUDIES ELECTIVES:
Agriculture 101
American Studies 310
Anthropology 130, 310, 311, 312, 313, 314, 315, 319, 320, 320, 361, 380
Architecture 111
Botany 200
Biology 330
Geography 320, 323, 340, 361
Chemistry 310
Chemistry 310
OHLDS 490
Physical Science 380
University Studies 310, 311, 320, 321, 410, 411, 420
Urban Studies 410

WRITING OR SPEECH ELECTIVES:
English 301, 302, 221, 223, 223, 251, 253, 263, 381, 301, 302, 332, 333, 334

Journals 3, 210, 310
Speech Communication 210, 240, 270, 330

ADDITIONAL ELECTIVE LIST: BUSINESS CONCENTRATION

BUSINESS ELECTIVES:
Business Law 301
Finance 300
Logistics 300
Management 301, 321, 341, 431
Marketing 301, 310, 320, 420

ADDITIONAL ELECTIVE LIST: PUBLIC HORTICULTURE CONCENTRATION

TECHNICAL ELECTIVES:
Accounting 415
Agriculture and Extension Education 346, 441
Botany 403, 431
Ecology and Evolutionary Biology 411, 412, 484
Entomology and Plant Pathology 410, 430
Forestry 421
Interior Design 200
Management 301
Philosophy 542
Plant & Soil Sciences 413, 414, 415, 430, 471
Psychological Studies 210
Psychology 400
Public Health 410
Public Relations 270, 470
Recreation & Leisure Studies 410, 430
Speech 440
Wildlife and Fisheries Sciences 211

ADDITIONAL ELECTIVE LIST: LANDSCAPE DESIGN CONCENTRATION

TECHNICAL ELECTIVES:
Art 425
Biosystems Engineering Technology 212, 315
Botany 431
Economics 461
Entomology and Plant Pathology 313, 321, 410
Forestry, Wildlife, and Fisheries 211, 230
Geography 439
Plant and Soil Sciences 311, 334, 414

PLANT AND SOIL SCIENCES

Professors:
F.L. Alan (Head), Ph.D. Minnesota, J.T. Ammons, Ph.D. West Virginia, P.F. Ball (Emeritus), Ph.D. Iowa State; D.J. Coyle, Ph.D. Purdue; B.V. Conger, Ph.D. Washington State; D.E. Dayton, Ph.D. North Carolina State; J.E. Foss (Emeritus), Ph.D. Minnesota, H.A. Fries, Ph.D. Iowa State; R.M. Haynes, Ph.D. Rice; R.J. Hays, Ph.D. (Emeritus), Ph.D. North Carolina State; W.L. Hunt (Emeritus), Ph.D. Purdue; J.H. Heynckes, Ph.D. Wisconsin; C.E. Sims, Ph.D. Michigan State; E.E. Springer (Emeritus), Ph.D. California (Berkeley); H.D. Swingle (Emeritus), Ph.D. Purdue; T.J. Tyler, Ph.D. Kentucky; D.R. West, Ph.D. Nebraska.

Associate Professors:
M.E. Essang (Ph.D. California (Riverside)); W.A. Kuepper (Emeritus), Ph.D. Illinois; G.M. Lessman, Ph.D. Michigan State; J. Logan, Nebraska; T.C. Mueller, Ph.D. Georgia; M.D. Mullin, Ph.D. North Carolina State; V.H. Reich, Ph.D. Colorado.

Assistant Professor:
V.R. Piltzollis, North Carolina State

Advisers:
Allen, Coiffay, Dayton, Lessman, Logan, Mullin, Reynolds, Robinson, and others will assist in designing a program to meet the individual advising needs of each student. The curriculum permits student to design a program of study to meet their individual advising needs. The curriculum permits students to design a program of study to meet their individual advising needs. The curriculum permits students to design a program of study to meet their individual advising needs.

The Plant and Soil Sciences major must have knowledge of the basic chemical, physical, and biological sciences and be trained in communication and computer skills. The student may then choose to pursue a career or to specialize in a more specific phase of the subject. The Plant and Soil Sciences major has three concentrations: Science/Technology Concentration, Management/Consulting Concentration, and Environmental Science and Natural Resource Concentration. Within each concentration, the basic curricular requirements for the College of Agricultural Sciences and Natural Resources are fulfilled, while the appropriate selection of the many electives available in the curriculum permits students to design a program of study to meet their individual advising needs and career goal. Graduates in science and technology and environmental science and natural resources are prepared for a better understanding of our soil resources; soil management for optimum crop production; soil conservation; and environmental quality; soil nutrient management and efficient fertilizer and biostimulant utilization.

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**Management/Consulting Concentration**

The management and consulting concentration permits the student to obtain a B.S. in Agriculture with a major in Plant and Soil Sciences and a minor in either Agricultural Economics, Business Administration (BA) or Business Administration (BS). This concentration is designed for the student whose goal is to enter a management training program in agricultural or consulting firms, as well as for those students who may wish to start their own business, whether it be associated with farm operations or some other aspect of management or consulting. Directed technical electives allow the student to concentrate in an area of their interest. Additional, graduates of this concentration have the option of pursuing the M.S. degree in Plant and Soil Sciences or Agricultural Economics or the M.B.A. degree in Business Administration. Graduates of this curriculum may also be eligible to become professionally certified in various specialized fields through the appropriate selection of electives.

### Environmental Science and Natural Resources Concentration

The Environmental Science and Natural Resources Concentration is a science oriented curriculum that provides a strong, broad background in the natural sciences. The plan of study emphasizes land use problems and their impacts on long-term use and productivity as well as on surface and sub-surface water resources. To facilitate this, the student is directed into a core of courses that emphasizes the soil and plant sciences. Directed technical electives allow the student to concentrate in an area of their interest. This concentration will introduce students to natural resource problems and their management, including soil and water conservation issues, flood plains, waste disposal, and reclamation of disturbed lands. Other areas of interest can be addressed through the appropriate selection of technical electives in the program. Students in this program will gain the practical knowledge necessary to compete for career opportunities in government, environmental consulting firms, public health services, environmental research laboratories, and agricultural production, while also gaining the theoretical training necessary for pursuing a advanced degrees in a number of environmentally related fields.
Chemistry 310, 319, 360, 369
Geography 310, 334, 411, 412, 434
Geology 310, 370, 460, 461, 465
Math 231, 241, 251, 405
Physics 122, 221, 222
Statistics 261, 262, 261, 302, 321, 411

ELECTIVES LIST: MANAGEMENT/CONSULTING CONCENTRATION

INTEGRATED STUDIES ELECTIVES:
American Studies 310
Anthropology 130, 310, 311, 312, 313, 314, 315, 319, 320, 360, 361
Geography 320, 323, 340, 361
Rural Sociology 380
Sociology 330, 343, 345, 462, 464
University Studies 310, 311, 320, 323, 322, 410, 420

SOCIAL SCIENCE ELECTIVES:
Anthropology 130, 310, 311, 312, 313, 314, 315, 319, 320, 360, 361
Geography 320, 323, 340, 361
Rural Sociology 380
Sociology 330, 343, 345, 462, 464
University Studies 310, 311, 320, 323, 322, 410, 420

BUSINESS ELECTIVES:
Accounting 205, 206, 220, 270, 300, 402

NON-DEPARTMENTAL AGRICULTURE ELECTIVES:
Biosystems Engineering Technology 442, 462
Animal Science 330

Entomology and Plant Pathology 313, 321
Ornamental Horticulture and Landscape Design 310, 340

PLANT AND SOIL SCIENCES ELECTIVES:
Plant and Soil Sciences 230, 412, 413, 414, 415, 431, 432, 433, 453

WRITING ELECTIVES:
English 205, 206, 455
Journalism 310, 414, 450, 451

ELECTIVES LIST: ENVIRONMENTAL SCIENCE AND NATURAL RESOURCES CONCENTRATION

INTEGRATED STUDIES ELECTIVES:
American Studies 310
Anthropology 130, 310, 311, 312, 313, 314, 315, 319, 320, 360, 361
Geography 320, 323, 340, 361
Rural Sociology 380
Sociology 330, 343, 345, 462, 464
University Studies 310, 311, 320, 323, 322, 410, 420

DIRECTED TECHNICAL ELECTIVES:
Soil (Land) Resources Group
Biosystems Engineering 315
Biosystems Engineering Technology 242, 442
Botany 330, 331
Chemistry 310, 319
Plant and Soil Sciences 202, 315, 412, 415, 432, 433

Geology 310, 411, 412, 413, 434
Geology 102, 103, 202, 310, 400, 405
Physics 121

Plant (Biological) Resources Group
Biology 140, 240
Botany 310, 320, 330, 431
Chemistry 310, 319
Entomology and Plant Pathology 313
Forestry 311
FWF 317
Geography 439
Plant and Soil Sciences 331, 334, 335, 431, 433, 436, 437, 453
Physics 121

Water Resources Group
Biosystems Engineering 315
Biosystems Engineering Technology 442
Chemistry 310, 319
Geology 310, 334, 411, 412, 413, 434, 436
Geology 485
Ecology 470, 471, 474
Plant and Soil Sciences 315, 415, 433

Physics 121

ENGINEERING ELECTIVES:
Biosystems Engineering 243, 310
Biosystems Engineering Technology 212, 442, 462
Civil and Environmental Engineering 486 (pre-requisites are Biosys. Eng. 243 and Math 142)