The College of Agriculture, Forestry, and Life Sciences (www.clemson.edu/CAFLS) offers a broad range of academic degree programs providing a sound knowledge base and technical expertise in the basic and applied sciences including the life sciences. The Bachelor of Science degree is available in 17 academic programs; the Bachelor of Arts is offered in Biological Sciences.

Preprofessional Health Studies non-degree programs are offered in Premedicine, Prepharmacy, Prevetinary Medicine. A bachelor’s degree can be obtained by fulfilling additional requirements specified by the University.

The undergraduate academic programs include Agricultural and Applied Economics with a Community and Economic Development Concentration; Agricultural Education; Agricultural Mechanization and Business; Animal and Veterinary Sciences with concentrations in Animal Agribusiness, Equine Business, and Prevetinary and Science; Biochemistry; Biological Sciences; Biosystems Engineering; Environmental and Natural Resources with concentrations in Conservation Biology, Natural Resource and Economic Policy, and Natural Resources Management; Food Science with concentrations in Food Science and Technology and Nutrition and Dietetics; Forest Resource Management; Genetics; Horticulture; Microbiology with a Biomedicine Concentration; Packaging Science; Soils and Sustainable Crop Systems with concentrations in Agricultural Biotechnology, Soil and Water Environmental Science, and Sustainable Crop Production; Turfgrass; and Wildlife and Fisheries Biology.

Minors are available to students who wish to broaden their educational background and enhance their expertise. (See page 56 for acceptable minors.)

Scholarships
A range of scholarships is available to students who excel in their academic performance. Information on scholarships and financial aid can be obtained from specific departments in the College or from the Student Financial Office in Sikes Hall.

Student Services
The college has a comprehensive Student Service Center offering a career library, company literature, career search technology, and video/audio resources.

AGRICULTURAL AND APPLIED ECONOMICS

Bachelor of Science
The Agricultural and Applied Economics curriculum emphasizes a strong background in economics with applications to production agriculture, agribusiness, natural resources, and the environment. Courses are also included in basic agricultural and biological sciences, liberal arts, and business.

Employment opportunities for graduates in Agricultural and Applied Economics are many and diverse. Private sector opportunities include agricultural production, banking, finance, marketing, and public relations. Public sector opportunities include national/local organizations, government agencies, educational institutions, and cooperative extension services. Graduates have also begun businesses or returned to family-owned businesses. This major also provides an excellent background for professional or graduate study in several disciplines.

Freshman Year

First Semester
1 - Elective
1

Second Semester
1 - Elective
1

Sophomore Year

First Semester
1 - Elective
1

Second Semester
2 - See advisor.

Junior Year

First Semester
1 - Elective
1

Second Semester
1 - Elective
1

Senior Year

First Semester
1 - Elective
1

Second Semester
1 - Elective
1

COMMUNITY AND ECONOMIC DEVELOPMENT CONCENTRATION

The program in Community and Economic Development provides career opportunities for social science administration, management, outreach, and research. A Bachelor of Science degree in Agricultural and Applied Economics with a concentration in Community and Economic Development facilitates employment with local, state, regional, federal, and international agencies; research and consulting firms; financial institutions; foundations and councils; public and private utilities; and organizations requiring entrepreneurial skills. This program provides an excellent background for professional and graduate study in several disciplines.

Associations between natural resources and social, economic, and political institutions are investigated. The Community and Economic Development program provides the conceptual, analytical, and pragmatic qualifications to succeed as economic development specialists. Students receive practical training, and internships are available to complement coursework.

Freshman Year

First Semester
1 - Elective
1

Second Semester
1 - Elective
1
Second Semester
3 - ACC 201 Financial Accounting Concepts
3 - ENGL 103 Accelerated Composition
4 - Natural Science Requirement1
5 - Elective
15

Sophomore Year
First Semester
3 - EX ST 301 Introductory Statistics
3 - Arts and Humanities (Literature) Requirement1
3 - Microeconomics Requirement1
3 - Oral Communication Requirement1
3 - Elective
15

Second Semester
3 - CR D 357 Natural Resources Economics
3 - ECON 212 Principles of Macroeconomics
3 - PO SC 302 State and Local Government
3 - Advanced Writing Requirement1
3 - Behavioral Science Requirement1
15

Junior Year
First Semester
3 - CR D 335 Leadership in Org. and Commun.
3 - ECON (MGT) 306 Managerial Economics or
3 - ECON 314 Intermediate Microeconomics
3 - Behavioral Science Requirement1
3 - Emphasis Area Requirement1
3 - Marketing Requirement6
3 - Planning Requirement5
15

Second Semester
3 - AP EC 352 Public Finance
3 - CR D 336 Community Development Methods
3 - Behavioral Science Requirement1
3 - Emphasis Area Requirement1
3 - Planning Requirement5
15

Senior Year
First Semester
3 - CR D (AP EC) 411 Regional Impact Analysis
3 - EX ST 462 Statistics Applied to Economics
3 - RS (SOC) 459 The Community
6 - Emphasis Area Requirement6
15

Second Semester
3 - CR D (AP EC) 412 Regional Economic Development Theory and Policy
3 - Behavioral Science Requirement1
3 - Comm. and Econ. Dev. Practice/Applications2
6 - Emphasis Area Requirement3
15

120 Total Semester Hours

1See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement.
2PO SC 101, 102, or SOC 201
3AP EC 202, 257, or ECON 211
4Select from 300-400 level courses in ANTH, AP EC, CR D, CR P ECON, MGT, MKT, PO SC, PSYCH, or SOC.
5See advisor.
6AP EC 309, 351, or MKT 301
7AP EC 490, CR D (AP EC) 491, or 492

AGRICULTURAL EDUCATION

Bachelor of Science
Agricultural Education provides broad preparation in agricultural sciences and professional education, including communications and human relations skills. In addition to required courses, students may select a minor. (See page 56.)

The Bachelor’s degree prepares students for professional education positions in the mainstream of agriculture including teaching, cooperative extension service, and government agricultural agencies. The Agricultural Education degree also prepares students for other educational work such as agricultural missionary, public relations, and training officers in agricultural industry.

Freshman Year
First Semester
1 - AG ED 102 Agric. Ed. Freshman Seminar
3 - BIOL 103 General Biology I
1 - BIOL 105 General Biology Lab. I
3 - PHIL 102 Introduction to Logic
2 - Emphasis Area Requirement1
3 - Mathematics Requirement2
16-17

Second Semester
1 - AG ED 100 Orientation and Field Experience
3 - AG ED 103 Multiculturalism in Agric. Ed.
3 - AVS 150 Introduction to Animal Science
1 - AVS 151 Introduction to Animal Science Lab.
3 - BIOL 104 General Biology II
1 - BIOL 106 General Biology Lab. II
3 - ENGL 103 Accelerated Composition
15

Sophomore Year
First Semester
3 - AG ED 201 Intro. to Agricultural Education
3 - AG ED 204 Applied Agriculture Calculations
3 - AG ED 355 Team and Organizational Leadership in Food and Fiber Systems
3 - AP EC 202 Agricultural Economics
4 - CH 105 Chemistry in Context I
16

Second Semester
3 - AG ED 203 Teaching Agriscience
3 - AG M 205 Principles of Fabrication
4 - CH 106 Chemistry in Context II
3 - HORT 212 Introduction to Turfgrass Culture
1 - HORT 213 Turfgrass Culture Lab.
3 - Arts and Humanities (Literature) Requirement1
17

Junior Year
First Semester
3 - AG ED 303 Mech. Technology for Agric. Ed.
2 - AG M 221 Surveying
2 - ANTH 201 Introduction to Anthropology
4 - CSENV 202 Soils
3 - ED F 302 Educational Psychology
3 - HORT 303 Landscape Plants
18

Second Semester
1 - AG ED 302 Agric. Education Junior Seminar
3 - COMM 150 Intro. to Human Comm. or
3 - COMM 250 Public Speaking
3 - HORT 305 Plant Propagation
6 - Advanced Writing Requirement1
6 - Emphasis Area Requirement1
16

Senior Year
First Semester
3 - AG ED 401 Instructional Methods in Ag. Ed.
3 - AG ED 404 Biotechnology in Agricultural Ed.
6 - Emphasis Area Requirement1
12

Second Semester
12 - AG ED 406 Directed Teaching
2 - Emphasis Area Requirement1
14

124–125 Total Semester Hours

1See advisor. Select one of the following emphasis areas by the end of the sophomore year: Teacher Certification, Leadership, Communication.
2See General Education Requirements.

AGRICULTURAL MECHANIZATION AND BUSINESS

Bachelor of Science
The Agricultural Mechanization and Business major provides a program for students who desire training in areas relevant to dynamic agricultural enterprise. The program is organized with strength in both business management and technical support of agriculture and agribusiness. To produce well rounded individuals with good communication skills, the curriculum includes courses in the humanities, social sciences, English composition, and public speaking.

Graduates in Agricultural Mechanization and Business find meaningful and remunerative employment in a variety of situations directly and indirectly related to agricultural production, processing, marketing, and the many services connected therewith. Farming and technical sales in the agricultural, industrial, and heavy equipment industries are frequently chosen careers.

By completing this curriculum, graduates will have fulfilled the requirements for an Agricultural Business Management minor or other selected minor. Contact the Enrolled Student Services Office to have the minor recorded.

Additional information is available from the departmental offices or can be found at www.clemson.edu/agbioeng/agmech/index.htm.
### Freshman Year

**First Semester**
- 3 - AG ED 200 Agricultural Applications of Educational Technology
- 1 - AG M 101 Intro. to Ag. Mech. and Business
- 3 - BIOL 103 General Biology I
- 1 - BIOL 105 General Biology Lab. I
- 4 - CH 105 Chemistry in Context I
- 3 - MTHSC 102 Intro. to Mathematical Analysis
- 15

**Second Semester**
- 3 - BIOL 104 General Biology II
- 1 - BIOL 106 General Biology Lab. II
- 4 - CH 106 Chemistry in Context II
- 3 - ENGL 103 Accelerated Composition
- 3 - EX ST 301 Introductory Statistics
- 1 - Elective
- 15

### Sophomore Year

**First Semester**
- 3 - AG M 205 Principles of Fabrication
- 3 - AP EC 202 Agricultural Economics
- 4 - PHYS 200 Introductory Physics or
- 3 - PHYS 207 General Physics I and
- 1 - PHYS 209 General Physics I Lab.
- 3 - Arts and Humanities (Literature) Requirement1
- 2 - Elective
- 15

**Second Semester**
- 3 - ACCT 201 Financial Accounting Concepts
- 3 - AG M 206 Machinery Management
- 3 - AG M 303 Calculations for Mechanized Agric.
- 3 - COMM 250 Public Speaking
- 2 - E G 209 Intro. to Engr./Comp. Graphics
- 3 - Minor Requirement2
- 17

### Junior Year

**First Semester**
- 2 - AG M 221 Surveying
- 2 - AG M 301 Soil and Water Conservation
- 3 - AG M 460 Electrical Systems
- 3 - AP EC 302 Economics of Farm Management
- 3 - ENGL 304 Business Writing or
- 3 - ENGL 314 Technical Writing
- 3 - Minor Requirement2
- 16

**Second Semester**
- 3 - AG M 406 Mechanical and Hydraulic Systems
- 3 - AP EC 309 Econ. of Agricultural Marketing
- 4 - CSENV 202 Soils
- 3 - Arts and Humanities (Non-Lit.) Requirement1
- 3 - Minor Requirement2
- 16

### Senior Year

**First Semester**
- 3 - AG M 402 Drainage, Irrig. and Waste Mgt.
- 3 - AP EC 319 Agribusiness Management
- 3 - Agriculture Requirement3
- 3 - Social Science Requirement4
- 12

**Second Semester**
- 3 - AG M 405 Agricultural Structures and Environmental Control
- 3 - AG M 410 Precision Agriculture Technology
- 3 - AG M 452 Mobile Power
- 3 - AG M 472 Capstone
- 3 - Minor Requirement1
- 15
- 121 Total Semester Hours

1See General Education Requirements.
2See Agricultural Business Management minor or select other approved minor.
3See advisor.
4See General Education Requirements. This course must also satisfy the Cross-Cultural Awareness Requirement.

### ANIMAL AND VETERINARY SCIENCES

#### Bachelor of Science

The curriculum in Animal and Veterinary Sciences provides students with a broad base of understanding of scientific principles and the application of these principles to scientific, technical, and business phases of livestock and poultry production, processing, and marketing. Special emphasis is placed on hands-on instruction, and students are given many opportunities to work with animals at the Morgan Poultry Farm, LaMaster Dairy Center, Starkey Swine Center, Equine Center, and Simpson Beef Unit. Students may choose from three concentrations: Animal Agribusiness, Equine Business, or Preveterinary and Science.

Students choosing the Animal Agribusiness Concentration will be prepared for careers in the animal industries including production, sales and marketing, business management, advertising, and extension. Students in the Equine Business Concentration will be prepared for careers as trainers, managers, riding instructors, sales representatives, etc. Students selecting the Preveterinary and Science Concentration will meet the requirements for most veterinary schools, graduate schools, and medical and dental schools. Students with South Carolina residency may compete for slots at the Mississippi State, Tuskegee, and University of Georgia Colleges of Veterinary Medicine.

#### ANIMAL AGRIBUSINESS CONCENTRATION

**Freshman Year**

**First Semester**
- 1 - AVS 100 Orientation to AVS
- 3 - AVS 150 Introduction to Animal Science
- 1 - AVS 151 Intro. to Animal Science Lab.
- 3 - BIOL 103 General Biology I and
- 1 - BIOL 105 General Biology Lab. I or
- 5 - BIOL 110 Principles of Biology I
- 4 - CH 101 General Chemistry
- 3 - Arts and Humanities (Non-Lit.) Requirement1
- 16-17

**Second Semester**
- 3 - BIOL 104 General Biology II and
- 1 - BIOL 106 General Biology Lab. II or
- 5 - BIOL 111 Principles of Biology II
- 4 - CH 102 General Chemistry
- 3 - ENGL 103 Accelerated Composition
- 3 - MTHSC 103 Essen. Math. for Informed Soc. or
- 3 - MTHSC 102 Intro. to Math. Analysis or
- 4 - MTHSC 106 Calculus of One Variable I
- 2 - AVS Techniques Requirement2
- 16-18

**Sophomore Year**

**First Semester**
- 3 - ACCT 201 Financial Accounting Concepts
- 3 - AP EC 202 Agricultural Economics
- 3 - AVS 312 Forages and Grazing Systems
- 3 - Arts and Humanities (Literature) Requirement1
- 2 - AVS Techniques Requirement2
- 14

**Second Semester**
- 3 - AVS 310 Animal Health
- 2 - AVS Evaluation Requirement1
- 2 - AVS Techniques Requirement2
- 3 - Departmental Requirement4
- 3 - Social Science Requirement1
- 3 - Elective
- 16

**Junior Year**

**First Semester**
- 4 - AVS 301 Anat. and Phys. of Domestic Animals
- 3 - AVS 370 Principles of Animal Nutrition
- 3 - AVS 470 Animal Genetics
- 3 - Advanced Writing Requirement1
- 3 - Departmental Requirement4
- 16

**Second Semester**
- 3 - AVS 375 Applied Animal Nutrition
- 3 - AVS 413 Animal Products
- 3 - AVS 453 Animal Reproduction
- 2 - AVS Techniques Requirement2
- 6 - Departmental Requirement4
- 17

**Senior Year**

**First Semester**
- 12 - AVS 360 Advanced Internship

**Second Semester**
- 2 - AVS 406 Seminars and Related Topics
- 3 - AVS 410 Domestic Animal Behavior
- 3 - AVS 415 Contemporary Issues in Animal Sci.
- 4 - AVS 417 Animal Agribusiness Development
- 4 - AVS 450 Animal Production Systems
- 16
- 123–126 Total Semester Hours

1See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement.
2AVS 200, 201, 203, 204, or 206
3AVS 302, 309, 311, or 323
4AG M 402, 405, 410, AP EC 302, 309, 319, 351, 420, 421, 433, 452, 456, 460; AVS444, 455, CSENV 202, ECON 212, MGT 201, 307, MKT 301, SPAN 101, or 102
<table>
<thead>
<tr>
<th>Year</th>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Freshman Year</strong></td>
<td>1. AVS 100 Orientation to AVS</td>
<td>2. AVS 385 Equine Behavior and Training</td>
</tr>
<tr>
<td></td>
<td>2. AVS 150 Introduction to Animal Science</td>
<td>2. AVS 416 Equine Exercise Physiology</td>
</tr>
<tr>
<td></td>
<td>3. BIOL 105 General Biology Lab. I or BIOL 105 General Biology Lab. I or BIOL 106 General Biology Lab. II</td>
<td>3. AVS Experience-Based Activity&lt;sup&gt;4&lt;/sup&gt;</td>
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<td>4. CH 101 General Chemistry</td>
<td>3. Departmental Requirement&lt;sup&gt;5&lt;/sup&gt;</td>
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<td></td>
<td>5. BIOL 110 Principles of Biology I</td>
<td>14</td>
</tr>
<tr>
<td><strong>Second Semester</strong></td>
<td>1. AVS 100 Orientation to AVS</td>
<td>2. AVS 412 Advanced Equine Management</td>
</tr>
<tr>
<td></td>
<td>3. BIOL 105 General Biology Lab. I or BIOL 111 Principles of Biology II</td>
<td>4. AVS 417 Animal Agribusiness Development</td>
</tr>
<tr>
<td></td>
<td>4. CH 102 General Chemistry</td>
<td>3. Departmental Requirement&lt;sup&gt;5&lt;/sup&gt;</td>
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<td>5. ENGL 103 Accelerated Composition</td>
<td>14</td>
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<tr>
<td></td>
<td>6. MTHSC 101 Essentials. Math. for Informed Soc. or MTHSC 102 Intro. to Math.</td>
<td>122–125 Total Semester Hours</td>
</tr>
<tr>
<td></td>
<td>7. MTHSC 106 Calculus of One Variable I</td>
<td><strong>PREVENTRIETARY AND SCIENCE CONCENTRATION</strong></td>
</tr>
<tr>
<td><strong>Sophomore Year</strong></td>
<td>1. AVS 100 Orientation to AVS</td>
<td><strong>Freshman Year</strong></td>
</tr>
<tr>
<td></td>
<td>2. AVS 204 Horse Care Techniques</td>
<td>1. AVS 100 Orientation to AVS</td>
</tr>
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<td>3. BIOL 104 General Biology II and BIOL 106 General Biology Lab. II or BIOL 106 General Biology Lab. II</td>
<td>2. AVS 105 General Biology Lab. I or BIOL 111 Principles of Biology II</td>
</tr>
<tr>
<td></td>
<td>4. CH 102 General Chemistry</td>
<td>3. CH 101 General Chemistry</td>
</tr>
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<td></td>
<td>5. ENGL 103 Accelerated Composition</td>
<td>3. Arts and Humanities (Non-Lit.) Requirement&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>7. MTHSC 106 Calculus of One Variable I</td>
<td><strong>Second Semester</strong></td>
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<tr>
<td></td>
<td>8. MTHSC 106 Calculus of One Variable I</td>
<td>1. GEN 301 Fundamental Genetics</td>
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<td></td>
<td>9. BIOL 110 Principles of Biology I</td>
<td>2. Microbiology I</td>
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<td>10. BIOL 111 Principles of Biology I</td>
<td>3. BIOCH 441, 442, 443, or 491</td>
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<td>11. CH 101 General Chemistry</td>
<td><strong>Second Semester</strong></td>
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<td>12. CH 102 General Chemistry</td>
<td>1. AVS 100 Orientation to AVS</td>
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<td>13. ENGL 103 Accelerated Composition</td>
<td>2. AVS 105 General Biology Lab. I or BIOL 111 Principles of Biology II</td>
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<td>14. MTHSC 101 Essentials. Math. for Informed Soc. or MTHSC 102 Intro. to Math.</td>
<td>3. CH 101 General Chemistry</td>
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<td>15. MTHSC 106 Calculus of One Variable I</td>
<td>3. Arts and Humanities (Non-Lit.) Requirement&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
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<td>16. MTHSC 106 Calculus of One Variable I</td>
<td>16</td>
</tr>
<tr>
<td><strong>Junior Year</strong></td>
<td>1. AVS 100 Orientation to AVS</td>
<td><strong>Second Semester</strong></td>
</tr>
<tr>
<td></td>
<td>2. AVS 204 Horse Care Techniques</td>
<td>1. GEN 301 Fundamental Genetics</td>
</tr>
<tr>
<td></td>
<td>3. BIOL 104 General Biology II and BIOL 106 General Biology Lab. II or BIOL 106 General Biology Lab. II</td>
<td>2. Microbiology I</td>
</tr>
<tr>
<td></td>
<td>4. CH 102 General Chemistry</td>
<td>3. BIOCH 441, 442, 443, or 491</td>
</tr>
<tr>
<td></td>
<td>5. MTHSC 101 Essentials. Math. for Informed Soc. or MTHSC 102 Intro. to Math.</td>
<td>16</td>
</tr>
<tr>
<td><strong>Senior Year</strong></td>
<td>1. AVS 100 Orientation to AVS</td>
<td><strong>Second Semester</strong></td>
</tr>
<tr>
<td></td>
<td>2. AVS 204 Horse Care Techniques</td>
<td>1. GEN 301 Fundamental Genetics</td>
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<tr>
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<td>3. BIOL 104 General Biology II and BIOL 106 General Biology Lab. II or BIOL 106 General Biology Lab. II</td>
<td>2. Microbiology I</td>
</tr>
<tr>
<td></td>
<td>4. CH 102 General Chemistry</td>
<td>3. BIOCH 441, 442, 443, or 491</td>
</tr>
<tr>
<td></td>
<td>5. MTHSC 101 Essentials. Math. for Informed Soc. or MTHSC 102 Intro. to Math.</td>
<td>16</td>
</tr>
<tr>
<td><strong>Senior Year</strong></td>
<td>1. AVS 100 Orientation to AVS</td>
<td><strong>Second Semester</strong></td>
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<tr>
<td></td>
<td>2. AVS 204 Horse Care Techniques</td>
<td>1. GEN 301 Fundamental Genetics</td>
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<td>3. BIOL 104 General Biology II and BIOL 106 General Biology Lab. II or BIOL 106 General Biology Lab. II</td>
<td>2. Microbiology I</td>
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<td></td>
<td>4. CH 102 General Chemistry</td>
<td>3. BIOCH 441, 442, 443, or 491</td>
</tr>
<tr>
<td></td>
<td>5. MTHSC 101 Essentials. Math. for Informed Soc. or MTHSC 102 Intro. to Math.</td>
<td>16</td>
</tr>
</tbody>
</table>

**College of Agriculture, Forestry, and Life Sciences**
BIOCHEMISTRY

Bachelor of Science

Biochemistry is the study of the molecular basis of life. To comprehend current biochemical information and make future contributions to our molecular understanding of life processes, students must obtain a broad background in biology and a firm foundation in chemistry, mathematics, and physics. This is the basis of the biochemistry curriculum.

The program provides an excellent educational background for professional school (medicine, dentistry, or veterinary medicine) and graduate school in biochemistry, molecular biology, or another biological science discipline. Graduates will find employment opportunities in the research and service programs of universities, medical schools, hospitals, research institutes, and industrial and government laboratories.

Freshman Year
First Semester
1 - BIOCH 103 Careers in Biochem. and Genetics
5 - BIOL 110 Principles of Biology I
4 - CH 101 General Chemistry
4 - MTHSC 106 Calculus of One Variable I

Second Semester
5 - BIOL 111 Principles of Biology II
4 - CH 102 General Chemistry
3 - ENGL 103 Accelerated Composition
4 - MTHSC 108 Calculus of One Variable II

Sophomore Year
First Semester
3 - CH 223 Organic Chemistry
1 - CH 227 Organic Chemistry Lab.
3 - GEN 302 Molecular and General Genetics
1 - GEN 303 Molecular and Gen. Genetics Lab.
3 - PHYS 122 Physics with Calculus I
1 - PHYS 124 Physics Lab. I
3-4 - Advanced Mathematics Requirement

Second Semester
3 - BIOCH 301 Molecular Biochemistry
3 - CH 224 Organic Chemistry
1 - CH 228 Organic Chemistry Lab.
3 - COMM 150 Intro. to Human Communication
1 - PHYS 221 Physics with Calculus II
1 - PHYS 223 Physics Lab. II
3 - Arts and Humanities (Literature) Requirement

Junior Year
First Semester
3 - BIOCH 431 Physical Approach to Biochem.
2 - BIOCH 433 General Biochemistry Lab. I
3 - CH 330 Introduction to Physical Chemistry
3 - ENGL 314 Technical Writing
3 - Science Requirement
2 - Elective

Second Semester
3 - BIOCH 432 Biochemistry of Metabolism
2 - BIOCH 434 General Biochemistry Lab. II
3 - BIOCH 436 Nucleic Acid and Protein Biosyn.
3 - PHIL 326 Science and Values
3 - Science Requirement
14

Senior Year
First Semester
3 - BIOCH 491 Special Problems in Biochemistry
2 - BIOCH 493 Senior Seminar
3 - Social Science Requirement
6 - Elective
16

Second Semester
3 - BIOCH 491 Special Problems in Biochemistry
2 - BIOCH 493 Senior Seminar
3 - Social Science Requirement
6 - Elective

122–123 Total Semester Hours

Notes:
1. See General Education Requirements.
2. CH 331 may be substituted.
3. Select from CH 411, ENT (GEN) 495, GEN (BIOSC) 405, 410, (BIOSC) 416, (BIOSC, MICRO) 418, 420, 450, HORT (BIOSC, GEN) 465, MICRO 415. Other courses must be approved by advisor.
4. To be taken over two semesters with the same faculty member
5. A two-semester sequence of a foreign language is strongly recommended.
6. See General Education Requirements. This course must also satisfy the Cross-Cultural Awareness Requirement.

Notes:
1. A student is allowed to enroll in science and mathematics courses only when all prerequisites have been passed with a grade of C or higher.
2. A minimum grade of C is required in all science and mathematics courses. No student may exceed a maximum of two attempts, excluding a W, to complete successfully any science or mathematics course.

BIOLOGICAL SCIENCES

Bachelor of Science

Biology encompasses the broad spectrum of the modern life sciences, including the study of all aspects of life from the structure and function of the whole organism down to the subcellular levels and up through the interactions of organisms to the integrated existence of life on the entire planet. Descriptive, structural, functional, and evolutionary questions are explored through the hierarchy of the organization of life. Applications of current advances to the health and well-being of man and society, to nature and the continuation of earth as a balanced ecosystem, and to an appreciation of the place of natural science in our cultural heritage receive emphasis.

Majors in Biological Sciences receive classroom, laboratory, and field training in biology with an emphasis on chemistry, mathematics, and physics as necessary tools. The Bachelor of Science in Biological Sciences curriculum prepares students for graduate study in any of the life science areas (such as agricultural sciences, biochemistry, botany, cell and molecular biology, conservation, ecology and environmental science, entomology, forestry, genetics, industrial and regulatory biology, microbiology, morphology, physiology, wildlife biology, and zoology; for the health professions (medicine, dentistry, etc.), veterinary medicine; and for science teaching.

Combined Bachelor of Science in Biological Sciences/Master of Science in Bioengineering

Under this plan, students may reduce the time necessary to earn both degrees by applying graduate credits to both undergraduate and graduate program requirements. See Academic Regulations in this catalog for enrollment guidelines and procedures.

Students are encouraged to obtain the specific requirements for the dual degree from the Department of Biological Sciences or Bioengineering as early as possible in their undergraduate program as a number of required courses have prerequisites not normally taken by Biological Sciences majors.

Freshman Year
First Semester
5 - BIOL 110 Principles of Biology I
1 - BIOSC 101 Frontiers in Biology I
4 - CH 101 General Chemistry
3 - COMM 150 Intro. to Human Communication
4 - MTHSC 106 Calculus of One Variable I

Second Semester
5 - BIOL 111 Principles of Biology II
4 - MTHSC 108 Calculus of One Variable II

Sophomore Year
First Semester
3 - CH 223 Organic Chemistry
1 - CH 227 Organic Chemistry Lab.
3 - GEN 302 Molecular and General Genetics
1 - GEN 303 Molecular and Gen. Genetics Lab.
3 - PHYS 122 Physics with Calculus I
1 - PHYS 124 Physics Lab. I
3-4 - Advanced Mathematics Requirement

Second Semester
3 - BIOCH 301 Molecular Biochemistry
3 - CH 224 Organic Chemistry
1 - CH 228 Organic Chemistry Lab.
3 - COMM 150 Intro. to Human Comm. or
3 - COMM 250 Public Speaking
3 - PHYS 221 Physics with Calculus II
1 - PHYS 223 Physics Lab. II
3 - Arts and Humanities (Literature) Requirement

Junior Year
First Semester
3 - BIOCH 431 Physical Approach to Biochem.
2 - BIOCH 433 General Biochemistry Lab. I
3 - CH 330 Introduction to Physical Chemistry
3 - ENGL 314 Technical Writing
3 - Science Requirement
2 - Elective

Second Semester
3 - BIOCH 432 Biochemistry of Metabolism
2 - BIOCH 434 General Biochemistry Lab. II
3 - BIOCH 436 Nucleic Acid and Protein Biosyn.
3 - PHIL 326 Science and Values
3 - Science Requirement
14

Senior Year
First Semester
3 - BIOCH 491 Special Problems in Biochemistry
2 - BIOCH 493 Senior Seminar
3 - Social Science Requirement
6 - Elective
16

Second Semester
3 - BIOCH 491 Special Problems in Biochemistry
2 - BIOCH 493 Senior Seminar
3 - Social Science Requirement
6 - Elective

122–123 Total Semester Hours

Notes:
1. See General Education Requirements.
2. CH 331 may be substituted.
3. Select from CH 411, ENT (GEN) 495, GEN (BIOSC) 405, 410, (BIOSC) 416, (BIOSC, MICRO) 418, 420, 450, HORT (BIOSC, GEN) 465, MICRO 415. Other courses must be approved by advisor.
4. To be taken over two semesters with the same faculty member
5. A two-semester sequence of a foreign language is strongly recommended.
6. See General Education Requirements. This course must also satisfy the Cross-Cultural Awareness Requirement.

Notes:
1. A student is allowed to enroll in science and mathematics courses only when all prerequisites have been passed with a grade of C or higher.
2. A minimum grade of C is required in all science and mathematics courses. No student may exceed a maximum of two attempts, excluding a W, to complete successfully any science or mathematics course.
Junior Year
First Semester
1. BIOSC 335 Evolutionary Biology
2. BIOSC 461 Cell Biology
3. ENGL 314 Technical Writing
4. PHYS 207 General Physics I and
   1. PHYS 212 Physics with Calculus I and
   2. PHYS 124 Physics Lab. I

5. Major Requirement
5. Social Science Requirement

Second Semester
1. PHIL 324 Philosophy of Technology or
   2. PHIL 326 Science and Values
   3. PHYS 208 General Physics II and
   1. PHYS 210 General Physics II Lab. or
   3. PHYS 221 Physics with Calculus II and
   1. PHYS 223 Physics Lab. II
   2. Major Requirement
   3. Social Science Requirement

144 Total Semester Hours

1. BIOL 110 and 111 are strongly recommended; however, BIOL 103/105 may substitute for BIOL 110, and BIOL 104/106 may substitute for BIOL 111. The remaining 1-2 credits required must be satisfied by completing 1-2 extra credits from departmental course offerings at the 300 level or above. See advisor.

2. At least one lecture and associated laboratory must be completed for both Animal Diversity (BIOSC 302/306 or BIOSC 303/307) and for Plant Diversity (BIOSC 304/308 or BIOSC 305/309).

3. See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement.

4. At least one lecture and associated laboratory must be completed for both Biochemistry (BIOCH 301/302 or 305/306) and for Genetics (GEN 302/303 or 302/303). CH 228 may be substituted for BIOCH 302 or 306.

5. See advisor. Select one lecture/lab combination from each of the following fields:
   - Physiology—BIOSC 401/402, 459/460, 475/476
   The remaining courses may be selected from BIOCH 302, MICRO 305, or any BIOSC or BOT courses at the 300 level or higher.

ENTOMOLOGY EMPHASIS AREA
See Bachelor of Science curriculum for freshman year requirements.

Sophomore Year
First Semester
1. CH 223 Organic Chemistry and
   1. CH 227 Organic Chemistry Lab. or
   2. CH 201 Survey of Organic Chemistry
   3. ENT (BIOSC) 301 Insect Biology and Diversity
   4. Arts and Humanities (Literature) Requirement
   5. Biochemistry or Genetics Requirement

15

Second Semester
1. BIOSC 304 Biology of Plants and
   1. BIOSC 308 Biology of Plants Practicum or
   3. BIOSC 305 Biology of Algae and Fungi and
   1. BIOSC 309 Algae/Fungi Practicum
   2. CH 224 Organic Chemistry or
   3. Major Requirement
   4. Biochemistry or Genetics Requirement
   5. Major Requirement

15

Junior Year
First Semester
1. BIOSC 335 Evolutionary Biology
2. ENGL 314 Technical Writing
3. PHYS 207 General Physics I and
   1. PHYS 209 General Physics I Lab. or
   3. PHYS 122 Physics with Calculus I and
   1. PHYS 124 Physics Lab. I
   4. Entomology Requirement

14

Second Semester
1. PHIL 324 Philosophy of Technology or
   3. PHIL 326 Science and Values
   3. PHYS 208 General Physics II and
   1. PHYS 209 General Physics II Lab. or
   3. PHYS 122 Physics with Calculus II and
   1. PHYS 223 Physics Lab. II
   3. Entomology Requirement
   5. Major Requirement
   3. Social Science Requirement

16

Senior Year
First Semester
1. BIOSC 461 Cell Biology
2. BIOSC 462 Cell Biology Lab.
2. BIOSC (MICRO) 493 Senior Seminar
4. Entomology Requirement
4. Major Requirement

15

Second Semester
3. Entomology Requirement
   9. Major Requirement
   3. Social Science Requirement

124 Total Semester Hours

1. See General Education Requirements. Three of these credits must also satisfy the Cross-Cultural Awareness Requirement.

2. At least one lecture and associated laboratory must be completed for both Biochemistry (BIOCH 301/302 or 305/306) and for Genetics (GEN 302/303 or 302/303). CH 228 may be substituted for BIOCH 302 or 306.

3. See advisor. Select one lecture/lab combination from each of the following fields:
   - Physiology—BIOSC 401/402, 459/460, 475/476
   The remaining courses may be selected from BIOSC 302, MICRO 305, or any BIOSC or BOT courses at the 300 level or higher.

TOXICOLOGY EMPHASIS AREA
See Bachelor of Science curriculum for freshman year requirements.

Sophomore Year
First Semester
1. BIOSC 210 Introduction to Toxicology
2. CH 223 Organic Chemistry and
   1. CH 227 Organic Chemistry Lab. or
   4. CH 201 Survey of Organic Chemistry
   3. Major Requirement
   4. Animal or Plant Diversity Requirement
   5. Biochemistry or Genetics Requirement

15

Second Semester
3. CH 224 Organic Chemistry or
   3. Major Requirement
   4. Animal or Plant Diversity Requirement
   4. Biochemistry or Genetics Requirement
   4. Major Requirement

15

Junior Year
First Semester
1. BIOSC 335 Evolutionary Biology
2. ENGL 314 Technical Writing
3. PHYS 207 General Physics I and
   1. PHYS 209 General Physics I Lab. or
   3. PHYS 122 Physics with Calculus II and
   1. PHYS 223 Physics Lab. II
   4. Biochemistry or Genetics Requirement
   4. Animal or Plant Diversity Requirement
   4. Biochemistry or Genetics Requirement

15

Second Semester
3. PHYS 208 General Physics II and
   1. PHYS 209 General Physics II Lab. or
   3. PHYS 122 Physics with Calculus I and
   1. PHYS 124 Physics Lab. I
   4. Major Requirement

16

Senior Year
First Semester
3. PHYS 208 General Physics II and
   1. PHYS 210 General Physics II Lab. or
   3. PHYS 221 Physics with Calculus II and
   1. PHYS 223 Physics Lab. II
   3. Arts and Humanities (Literature) Requirement
   4. Major Requirement
   3. Social Science Requirement

14

44
Second Semester
3 - CH 413 Chemistry of Aqueous Systems or 3 - ENTOX 421 Chemical Sources and Fate in Environmental Systems
3 - PHIL 324 Philosophy of Technology or 3 - PHIL 326 Science and Values
4 - Major Requirement
3 - Social Science Requirement
3 - Toxicology Requirement

124 Total Semester Hours

BIOSYSTEMS ENGINEERING
Bachelor of Science
The Biosystems Engineering program is administered jointly with the College of Engineering and Science. See page 83 for the curriculum.

ENVIRONMENTAL AND NATURAL RESOURCES
Bachelor of Science
The Environmental and Natural Resources curriculum produces professionals who have a broad-based knowledge in natural resources and an ability to interact with other resource professionals to provide thoughtful solutions to environmental and natural resource problems. The world is blessed with an abundance of natural resources, but the problems associated with their conservation are immense. Protection of rare and endangered species, preventing and controlling invasions of exotics, protecting old growth forests, restoring degraded ecosystems, and balancing the resource demands of industry and the public are some of the environmental issues which are enmeshed in politicized environments.

Three concentrations are offered within the Environmental and Natural Resources major. The Conservation Biology Concentration is oriented toward students who desire a greater exposure to taxa, their habitats and their interrelationships. The Natural Resource and Economic Policy Concentration provides more in-depth study in economics and policy applications. The Natural Resources Management Concentration emphasizes both resource management and negotiation skills.

Graduates in Environmental and Natural Resources are well-prepared for further graduate studies in natural resources and related fields. Potential public sector employers of graduates include federal, state, and municipal resource management agencies, private industries impacting land and water resources, environmental management consulting firms, and various environmental advocacy groups.

Freshman Year
First Semester
5 - BIOL 110 Principles of Biology I
1 - BIOSC 101 Frontiers in Biology I
4 - CH 101 General Chemistry
3 - COMM 150 Intro. to Human Communication
4 - MTHSC 106 Calculus of One Variable I

Second Semester
5 - BIOL 111 Principles of Biology II
1 - BIOSC 102 Frontiers in Biology II
4 - CH 102 General Chemistry
3 - ENGL 103 Accelerated Composition
4 - MTHSC 108 Calculus of One Variable II or 3 - MTHSC 301 Statistical Methods I

Sophomore Year
First Semester
4 - CH 201 Survey of Organic Chemistry
4 - Animal or Plant Diversity Requirement
4 - Biochemistry or Genetics Requirement
4 - Foreign Language Requirement

Second Semester
4 - Animal or Plant Diversity Requirement
4 - Biochemistry or Genetics Requirement
4 - Foreign Language Requirement
3 - Minor Requirement

Junior Year
First Semester
3 - BIOSC 335 Evolutionary Biology
3 - BIOSC 461 Cell Biology
3 - ENGL 314 Technical Writing
3 - Foreign Language Requirement
3 - Major Requirement

Second Semester
3 - PHIL 324 Philosophy of Technology or 3 - PHIL 326 Science and Values
3 - Foreign Language Requirement
3 - Major Requirement
6 - Minor Requirement

Senior Year
First Semester
2 - BIOSC (MICRO) 493 Senior Seminar
3 - PHYS 207 General Physics I
1 - PHYS 209 General Physics I Lab.
3 - Major Requirement
3 - Minor Requirement
3 - Social Science Requirement

Second Semester
3 - PHYS 208 General Physics II
1 - PHYS 210 General Physics II Lab.
3 - Arts and Humanities (Literature) Requirement
3 - Major Requirement
3 - Minor Requirement
3 - Social Science Requirement

125–126 Total Semester Hours

BIOLOGICAL SCIENCES
Bachelor of Arts
The Bachelor of Arts in Biological Sciences provides a strong foundation in biology and is ideal for students desiring a liberal education emphasizing an interdisciplinary approach to a thorough understanding of the life sciences.

Freshman Year
First Semester
5 - BIOL 110 Principles of Biology I
1 - BIOSC 101 Frontiers in Biology I
4 - CH 101 General Chemistry
3 - COMM 150 Intro. to Human Communication
4 - MTHSC 106 Calculus of One Variable I

Second Semester
5 - BIOL 111 Principles of Biology II
1 - BIOSC 102 Frontiers in Biology II
4 - CH 102 General Chemistry
3 - ENGL 103 Accelerated Composition
4 - MTHSC 108 Calculus of One Variable II or 3 - MTHSC 301 Statistical Methods I

Sophomore Year
First Semester
4 - CH 201 Survey of Organic Chemistry
4 - Animal or Plant Diversity Requirement
4 - Biochemistry or Genetics Requirement
4 - Foreign Language Requirement

Second Semester
4 - Animal or Plant Diversity Requirement
4 - Biochemistry or Genetics Requirement
4 - Foreign Language Requirement
3 - Minor Requirement

Junior Year
First Semester
3 - BIOSC 335 Evolutionary Biology
3 - BIOSC 461 Cell Biology
3 - ENGL 314 Technical Writing
3 - Foreign Language Requirement
3 - Major Requirement

Second Semester
3 - PHIL 324 Philosophy of Technology or 3 - PHIL 326 Science and Values
3 - Foreign Language Requirement
3 - Major Requirement
6 - Minor Requirement

Senior Year
First Semester
2 - BIOSC (MICRO) 493 Senior Seminar
3 - PHYS 207 General Physics I
1 - PHYS 209 General Physics I Lab.
3 - Major Requirement
3 - Minor Requirement
3 - Social Science Requirement

Second Semester
3 - PHYS 208 General Physics II
1 - PHYS 210 General Physics II Lab.
3 - Arts and Humanities (Literature) Requirement
3 - Major Requirement
3 - Minor Requirement
3 - Social Science Requirement

125–126 Total Semester Hours

BIOLOGICAL SCIENCES
Bachelor of Arts
The Bachelor of Arts in Biological Sciences provides a strong foundation in biology and is ideal for students desiring a liberal education emphasizing an interdisciplinary approach to a thorough understanding of the life sciences.

Freshman Year
First Semester
5 - BIOL 110 Principles of Biology I
1 - BIOSC 101 Frontiers in Biology I
4 - CH 101 General Chemistry
3 - COMM 150 Intro. to Human Communication
4 - MTHSC 106 Calculus of One Variable I

Second Semester
5 - BIOL 111 Principles of Biology II
1 - BIOSC 102 Frontiers in Biology II
4 - CH 102 General Chemistry
3 - ENGL 103 Accelerated Composition
4 - MTHSC 108 Calculus of One Variable II or 3 - MTHSC 301 Statistical Methods I

Sophomore Year
First Semester
4 - CH 201 Survey of Organic Chemistry
4 - Animal or Plant Diversity Requirement
4 - Biochemistry or Genetics Requirement
4 - Foreign Language Requirement

Second Semester
4 - Animal or Plant Diversity Requirement
4 - Biochemistry or Genetics Requirement
4 - Foreign Language Requirement
3 - Minor Requirement

Junior Year
First Semester
3 - BIOSC 335 Evolutionary Biology
3 - BIOSC 461 Cell Biology
3 - ENGL 314 Technical Writing
3 - Foreign Language Requirement
3 - Major Requirement

Second Semester
3 - PHIL 324 Philosophy of Technology or 3 - PHIL 326 Science and Values
3 - Foreign Language Requirement
3 - Major Requirement
6 - Minor Requirement

Senior Year
First Semester
2 - BIOSC (MICRO) 493 Senior Seminar
3 - PHYS 207 General Physics I
1 - PHYS 209 General Physics I Lab.
3 - Major Requirement
3 - Minor Requirement
3 - Social Science Requirement

Second Semester
3 - PHYS 208 General Physics II
1 - PHYS 210 General Physics II Lab.
3 - Arts and Humanities (Literature) Requirement
3 - Major Requirement
3 - Minor Requirement
3 - Social Science Requirement

125–126 Total Semester Hours

BIOLOGICAL SCIENCES
Bachelor of Arts
The Bachelor of Arts in Biological Sciences provides a strong foundation in biology and is ideal for students desiring a liberal education emphasizing an interdisciplinary approach to a thorough understanding of the life sciences.

Freshman Year
First Semester
5 - BIOL 110 Principles of Biology I
1 - BIOSC 101 Frontiers in Biology I
4 - CH 101 General Chemistry
3 - COMM 150 Intro. to Human Communication
4 - MTHSC 106 Calculus of One Variable I

Second Semester
5 - BIOL 111 Principles of Biology II
1 - BIOSC 102 Frontiers in Biology II
4 - CH 102 General Chemistry
3 - ENGL 103 Accelerated Composition
4 - MTHSC 108 Calculus of One Variable II or 3 - MTHSC 301 Statistical Methods I

Sophomore Year
First Semester
4 - CH 201 Survey of Organic Chemistry
4 - Animal or Plant Diversity Requirement
4 - Biochemistry or Genetics Requirement
4 - Foreign Language Requirement

Second Semester
4 - Animal or Plant Diversity Requirement
4 - Biochemistry or Genetics Requirement
4 - Foreign Language Requirement
3 - Minor Requirement

Junior Year
First Semester
3 - BIOSC 335 Evolutionary Biology
3 - BIOSC 461 Cell Biology
3 - ENGL 314 Technical Writing
3 - Foreign Language Requirement
3 - Major Requirement

Second Semester
3 - PHIL 324 Philosophy of Technology or 3 - PHIL 326 Science and Values
3 - Foreign Language Requirement
3 - Major Requirement
6 - Minor Requirement

Senior Year
First Semester
2 - BIOSC (MICRO) 493 Senior Seminar
3 - PHYS 207 General Physics I
1 - PHYS 209 General Physics I Lab.
3 - Major Requirement
3 - Minor Requirement
3 - Social Science Requirement

Second Semester
3 - PHYS 208 General Physics II
1 - PHYS 210 General Physics II Lab.
3 - Arts and Humanities (Literature) Requirement
3 - Major Requirement
3 - Minor Requirement
3 - Social Science Requirement

125–126 Total Semester Hours

AG ED 200, CP SC 120, or other course approved by advisor
CONSERVATION BIOLOGY
CONCENTRATION

Sophomore Year
First Semester
3 - AP EC 257 Natural Resources, Environment, and Economics
4 - BIOSC 320 Field Botany or
2 - FOR 205 Dendrology and
3 - FOR 221 Forest Biology
3 - EX ST 301 Introductory Statistics
3 - Arts and Humanities (Literature) Requirement1
3 - Oral Communication Requirement1
16-17 Total Semester Hours

Second Semester
4 - CSENV 202 Soils
3 - GEN 300 Fundamental Genetics
3 - W FB (BIOSC) 313 Conservation Biology
3 - Physical Environment Requirement2
3 - Taxonomy/Habitat Requirement3
16

Junior Year
First Semester
3 - ENGL 314 Technical Writing
3 - Arts and Humanities (Non-Lit.) Requirement1
3 - Ecology Requirement4
3 - Physiology Requirement5
3 - Taxonomy/Habitat Requirement3
15

Second Semester
3 - BIOSC 335 Evolutionary Biology
3 - E N R 302 Natural Resources Measurements
3 - Ecology Requirement4
3 - Natural Resource Economics Requirement5
3 - Taxonomy/Habitat Requirement3
15

Senior Year
First Semester
3 - E N R 429 Environmental Law and Policy
3 - ECON 314 Intermediate Macroeconomics
3 - W FB (BIOSC) 313 Conservation Biology or
3 - Minor Requirement
3 - Advanced Writing Requirement3
3 - Applied Economics Requirement4
15

First Semester
3 - AP EC 457 Nat. Res. Econ. Theory and Policy
3 - ECON 319 Environmental Economics
3 - FOR (E N R) 434 GIS for Landscape Planning
3 - Ecology Requirement II1 or
3 - Minor Requirement
3 - Macroeconomics Requirement6
15

First Semester
3 - E N R 450 Conservation Issues
1 - FOR 498 Senior Portfolio or
1 - W FB 498 Senior Portfolio
3 - Social Science Requirement1
6 - Taxonomy/Habitat Requirement3
13
120–121 Total Semester Hours

1See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement.
2GEOG 101, GEO 102, or PHYS 240
3AGM 301, BIOSC 302/306, 303/307, 304/308, 305/309, 320, 406/407, 410/411, 442, 444, 446, 468, 472, 477, CSENV 404, ENT (BIOSC) 301, (BIOSC, W FB) 469, FOR 251, 406, GEO 112, 210, 403, MICRO 403, W FB 418, 440, or 462. At least four of the courses must be laboratories or courses with a required laboratory component.
4BIOSC 441, 442, 443, 446, or 470
5AVS 301, BIOSC 401/402, 458, 475, or (AVS) 480
6AP EC 433, 475, C R D 357, or FOR 304
7_EN R 429, 450, or W FB 430
8See advisor.

NATURAL RESOURCE
AND ECONOMIC POLICY
CONCENTRATION

Sophomore Year
First Semester
3 - AP EC 257 Natural Resources, Environment, and Economics
3 - PO SC 101 American National Government or
3 - PO SC 102 Intro. to International Rel. 
3 - Ecology Requirement1 or
3 - Minor Requirement
3 - Geography Requirement2
3 - Oral Communication Requirement1
15

Second Semester
3 - C R D 357 Natural Resources Economics
3 - EX ST 301 Introductory Statistics
3 - Arts and Humanities (Literature) Requirement1
3 - Arts and Humanities (Non-Lit.) Requirement1
15

Junior Year
First Semester
3 - E N R 429 Environmental Law and Policy
3 - ECON 312 Principles of Macroeconomics
3 - W FB (BIOSC) 313 Conservation Biology or
3 - Minor Requirement
3 - Advanced Writing Requirement3
3 - Applied Economics Requirement4
15

Second Semester
3 - AP EC 457 Nat. Res. Econ. Theory and Policy
3 - ECON 319 Environmental Economics
3 - FOR (E N R) 434 GIS for Landscape Planning
3 - Ecology Requirement II1 or
3 - Minor Requirement
3 - Macroeconomics Requirement6
15

Second Semester
3 - AP EC 457 Nat. Res. Econ. Theory and Policy
3 - ECON 319 Environmental Economics
3 - FOR (E N R) 434 GIS for Landscape Planning
3 - Ecology Requirement II1 or
3 - Minor Requirement
3 - Macroeconomics Requirement6
15

Senior Year
First Semester
3 - C R D (AP EC) 491 Internship, Agribusiness, and Community and Rural Development or
3 - Minor Requirement
3 - EX ST 462 Statistics Applied to Economics
9 - Applied Economics Requirement4 or
6 - Applied Economics Requirement4 and
3 - Minor Requirement
15

Second Semester
3 - E N R 450 Conservation Issues
6 - Applied Economics Requirement4
6 - Community Development Requirement2
4 - Elective or
3 - Minor Requirement and
1 - Elective
16
121 Total Semester Hours

NATURAL RESOURCES
MANAGEMENT
CONCENTRATION

Sophomore Year
First Semester
3 - AP EC 257 Natural Resources, Environment, and Economics
4 - CSENV 202 Soils
2 - FOR 205 Dendrology
3 - FOR 221 Forest Biology
3 - Arts and Humanities (Non-Lit.) Requirement1
3 - Oral Communication Requirement1
15

Second Semester
3 - FOR 206 Forest Ecology
3 - W FB (BIOSC) 313 Conservation Biology
3 - Arts and Humanities (Non-Lit.) Requirement1
3 - Social Science Requirement1
15

Junior Year
First Semester
4 - BIOSC 320 Field Botany or
3 - BIOSC 406 Intro. Plant Taxonomy and
1 - BIOSC 407 Plant Taxonomy Lab.
3 - E N R 429 Environmental Law and Policy or
3 - FOR 400 Public Relations in Natural Res.
3 - FOR (E N R) 434 GIS for Landscape Planning
5 - Minor Requirement2
15

Second Semester
3 - C R D 357 Natural Resources Economics
3 - E N R 302 Natural Resources Measurements
3 - GEO 101 Physical Geology
1 - GEO 103 Physical Geology Lab.
3 - W FB 350 Principles of Fish and Wildlife Biol.
3 - Minor Requirement2
16

Senior Year
First Semester
2 - FOR (E N R) 416 Forest Policy and Admin.
3 - W FB 418 Fishery Conservation
3 - W FB 462 Wetland Wildlife Biology
3 - Conservation Colloquium or Internship1
4 - Minor Requirement2
15
FOOD SCIENCE

Bachelor of Science

Food Science majors apply principles of basic and applied sciences to the design, creation, manufacture, packaging, distribution, and utilization of safe, nutritious, and enjoyable foods and food products. The curriculum allows flexibility for concentrating in one of two areas.

In the Food Science and Technology Concentration, students may emphasize business, culinary science (one of three national programs that have been approved by the Research Chef’s Association as Culinary™), engineering, food packaging, and additional sciences that complement requirements of the Institute of Food Technologists.

The Nutrition and Dietetics Concentration emphasizes nutrition and related areas. It is currently granted approval status by the Commission on Accreditation for Dietetics Education of the American Dietetic Association.

Food processing industries, ingredient manufacturers, and packaging suppliers employ graduates in new food product development, quality assurance, production management, and technical sales. State and federal agencies also need graduates for food safety and regulatory positions. With the Nutrition and Dietetics Concentration, employment opportunities include dietitians, nutritionists, consultants, and food specialists. Placement rates are high for these fields, and graduates are also well prepared to pursue graduate study in many areas.

The Department of Food Science and Human Nutrition also offers an accelerated five-year combined bachelor/master’s program that allows students to count up to twelve hours of graduate credit toward both the BS degree in Food Science and MS degree in Food, Nutrition, and Culinary Sciences. Details are available from the Department of Food Science and Human Nutrition or at www.clemson.edu/foodscience.

Freshman Year

First Semester
3 - BIOL 103 General Biology I and
1 - BIOL 105 General Biology Lab. I or
5 - BIOL 110 Principles of Biology I
4 - CH 101 General Chemistry
3 - COMM 150 Intro. to Human Communication
1 - FD SC 101 Epochs in Man’s Struggle for Food
3 - MTHSC 102 Intro. to Math. Analysis or
4 - MTHSC 106 Calculus of One Variable I

Second Semester
3 - BIOL 104 General Biology II and
1 - BIOL 106 General Biology Lab. II or
5 - BIOL 111 Principles of Biology II
4 - CH 102 General Chemistry
3 - ENGL 103 Accelerated Composition
2 - FD SC 102 Perspectives in Food and Nutrition Sciences
3 - PSYCH 201 Introduction to Psychology

Sophomore Year

First Semester
3 - AP EC 202 Agricultural Economics or
3 - ECON 211 Principles of Microeconomics or
3 - ECON 212 Principles of Macroeconomics
4 - CH 201 Survey of Organic Chemistry or
3 - CH 223 Organic Chemistry and
1 - CH 227 Organic Chemistry Lab.
3 - PHYS 122 Physics with Calculus I and
1 - PHYS 124 Physics Lab. I or
4 - PHYS 200 Introductory Physics or
3 - PHYS 207 General Physics I and
1 - PHYS 209 General Physics Lab.
3 - Arts and Humanities (Literature) Requirement
3 - Arts and Humanities (Non-Lit.) Requirement

Second Semester
3 - BIOCH 305 Essential Elements of Biochem.
1 - BIOCH 306 Essential Elements of Bioch. Lab.
3 - EX ST 301 Introductory Statistics
3 - FD SC 214 Food Resources and Society
3 - Elective

Junior Year

First Semester
3 - FD SC 417 Seminar
1 - FD SC 421 Special Problems in Food Science
4 - MICRO 407 Food and Dairy Microbiology
6 - Emphasis Area Requirement

Second Semester
3 - ENGL 304 Business Writing or
3 - ENGL 314 Technical Writing
1 - FD SC 417 Seminar
1 - FD SC 421 Special Problems in Food Science
4 - MICRO 407 Food and Dairy Microbiology
6 - Emphasis Area Requirement

Senior Year

First Semester
3 - FD SC 421 Special Problems in Food Science
4 - MICRO 407 Food and Dairy Microbiology
3 - NUTR 451 Human Nutrition
3 - Departmental Requirement
3 - Elective

Second Semester
4 - FD SC 420 Food Chemistry II
4 - FD SC 428 Food Process Engineering
3 - FD SC (PKGSC) 409 Total Quality Mgt. for the Food and Packaging Industries
1 - FD SC 418 Seminar
1 - FD SC 421 Special Problems in Food Science
3 - Elective

NUTRITION AND DIETETICS CONCENTRATION

Junior Year

First Semester
4 - BIOSC 222 Human Anatomy and Phys. I
1 - FD SC 491 Practicum
4 - MICRO 305 General Microbiology
3 - NUTR 451 Human Nutrition
3 - Elective

Second Semester
4 - BIOSC 223 Human Anatomy and Phys. II
3 - ENGL 304 Business Writing or
3 - ENGL 314 Technical Writing
1 - FD SC 417 Seminar
4 - MICRO 407 Food and Dairy Microbiology
3 - NUTR 455 Nutrition and Metabolism

Senior Year

First Semester
3 - FD SC 421 Special Problems in Food Science
4 - FD SC 401 Food Chemistry I
3 - FD SC 404 Food Preservation and Processing
2 - FD SC 407 Quantity Food Production
1 - FD SC 418 Seminar
4 - NUTR 424 Medical Nutrition Therapy I
17

Second Semester
4 - FD SC 401 Food Chemistry I
4 - FD SC 404 Food Preservation and Processing
2 - FD SC 407 Quantity Food Production
1 - FD SC 421 Special Problems in Food Science
13

Senior Year

First Semester
3 - FD SC 401 Food Chemistry I
4 - FD SC 404 Food Preservation and Processing
2 - FD SC 407 Quantity Food Production
1 - FD SC 418 Seminar
4 - NUTR 424 Medical Nutrition Therapy I
17

Second Semester
3 - ENGL 304 Business Writing or
3 - ENGL 314 Technical Writing
1 - FD SC 417 Seminar
1 - FD SC 421 Special Problems in Food Science
4 - MICRO 407 Food and Dairy Microbiology
6 - Emphasis Area Requirement

Senior Year

First Semester
3 - FD SC 401 Food Chemistry I
4 - FD SC 404 Food Preservation and Processing
2 - FD SC 407 Quantity Food Production
1 - FD SC 418 Seminar
4 - NUTR 424 Medical Nutrition Therapy I
17
Foresters earning advanced degrees find employ the conservation of natural resources is a concern. and aesthetic values, and in the recreational use of the production of timber, useable water, wildlife, forest-based businesses; as technical specialists iners, administrators, or owners of forest lands or curriculum also provides the necessary prerequisites private sectors. They may be engaged as manag employment opportunities in the public and Foresters are qualified for a broad spectrum of ment of forest resources, products, and services.

The Forest Resource Management curriculum combines a broad education in the arts and sciences with applied forest sciences. This combination provides the necessary foundation for the scientific management of forest resources, products, and services.

Foresters are qualified for a broad spectrum of employment opportunities in the public and private sectors. They may be engaged as managers, administrators, or owners of forest lands or forest-based businesses; as technical specialists in the production of timber, useable water, wildlife, and aesthetic values, and in the recreational use of the forest; or as professionals in other areas where the conservation of natural resources is a concern. Foresters earning advanced degrees find employment in academic work and in research conducted by public and private agencies.

The curriculum, accredited by the Society of American Foresters, provides a strong program in the basic knowledge and skills required of a professional forester. Forest Resource Management majors will select a minor. (See page 56.) The curriculum also provides the necessary prerequisites for graduate study.

Freshman Year
First Semester
3 - BIOL 103 General Biology I
1 - BIOL 105 General Biology Lab. I
4 - CH 105 Chemistry in Context I
1 - ENR 101 Intro. to Environ. and Natural Res. I
3 - MTHSC 102 Intro. to Mathematical Analysis
3 - Elective
15

Second Semester
3 - BIOL 104 General Biology II
1 - BIOL 106 General Biology Lab. II
4 - CH 106 Chemistry in Context II or 4 - PHYS 200 Introductory Physics
3 - CPSC 120 Intro. to Information Technology
3 - ENGL 103 Accelerated Composition
1 - FNR 102 FNK Freshman Portfolio
15

Sophomore Year
First Semester
4 - FNR 499 Natural Resources Seminar
4 - FOR 314 Harvesting and Forest Products
2 - FOR (ENR) 416 Forest Policy and Admin.
3 - FOR 417 Forest Resource Mgr. and Regulation
3 - Minor Requirement
15

Second Semester
2 - FOR 406 Forested Watershed Management
3 - FOR 415 Forest Wildlife Management
2 - FOR 425 Forest Resource Management Plans
1 - FOR 498 Senior Portfolio
6 - Minor Requirement
14

126 Total Semester Hours

Second Semester
3 - EX ST 301 Introductory Statistics
2 - FOR 205 Dendrology
3 - FOR 221 Forestry Biology
3 - Arts and Humanities (Literature) Requirement
15

Second Semester
3 - COMM 250 Public Speaking
3 - FOR 206 Forestry Ecology
3 - Economics Requirement
3 - Social Science Requirement
3 - Minor Requirement
15

Forestry Summer Camp
2 - FOR 251 Forest Communities
4 - FOR 253 Forest Mensuration
1 - FOR 254 Forest Products
7

Junior Year
First Semester
2 - FOR 302 Forest Biometrics
3 - FOR 304 Forest Resource Economics
2 - FOR 308 Remote Sensing and GIS in Forestry
2 - FOR 413 Integrated Forest Pest Management
3 - FOR (ENR) 434 GIS for Landscape Planning
14

Second Semester
3 - ENGL 314 Technical Writing
3 - FOR 418 Forest Resource Valuation
4 - FOR 465 Silviculture
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Minor Requirement
16

Senior Year
First Semester
1 - FNR 499 Natural Resources Seminar
2 - FOR 314 Harvesting and Forest Products
2 - FOR (ENR) 416 Forest Policy and Admin.
3 - FOR 417 Forest Resource Mgr. and Regulation
3 - Minor Requirement
15

Second Semester
2 - FOR 406 Forested Watershed Management
2 - FOR 415 Forest Wildlife Management
2 - FOR 425 Forest Resource Management Plans
1 - FOR 498 Senior Portfolio
6 - Minor Requirement
14

126 Total Semester Hours

Sophomore Year
First Semester
4 - CSENV 202 Soils
3 - EX ST 301 Introductory Statistics
2 - FOR 205 Dendrology
3 - FOR 221 Forestry Biology
3 - Arts and Humanities (Literature) Requirement
15

Second Semester
3 - COMM 250 Public Speaking
3 - FOR 206 Forestry Ecology
3 - Economics Requirement
3 - Social Science Requirement
3 - Minor Requirement
15

Forestry Summer Camp
2 - FOR 251 Forest Communities
4 - FOR 253 Forest Mensuration
1 - FOR 254 Forest Products
7

Junior Year
First Semester
2 - FOR 302 Forest Biometrics
3 - FOR 304 Forest Resource Economics
2 - FOR 308 Remote Sensing and GIS in Forestry
2 - FOR 413 Integrated Forest Pest Management
3 - FOR (ENR) 434 GIS for Landscape Planning
14

Second Semester
3 - ENGL 314 Technical Writing
3 - FOR 418 Forest Resource Valuation
4 - FOR 465 Silviculture
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Minor Requirement
16

Senior Year
First Semester
1 - FNR 499 Natural Resources Seminar
2 - FOR 314 Harvesting and Forest Products
2 - FOR (ENR) 416 Forest Policy and Admin.
3 - FOR 417 Forest Resource Mgr. and Regulation
3 - Minor Requirement
15

Second Semester
2 - FOR 406 Forested Watershed Management
2 - FOR 415 Forest Wildlife Management
2 - FOR 425 Forest Resource Management Plans
1 - FOR 498 Senior Portfolio
6 - Minor Requirement
14

126 Total Semester Hours

Sophomore Year
First Semester
4 - CSENV 202 Soils
3 - EX ST 301 Introductory Statistics
2 - FOR 205 Dendrology
3 - FOR 221 Forestry Biology
3 - Arts and Humanities (Literature) Requirement
15

Second Semester
3 - COMM 250 Public Speaking
3 - FOR 206 Forestry Ecology
3 - Economics Requirement
3 - Social Science Requirement
3 - Minor Requirement
15

Forestry Summer Camp
2 - FOR 251 Forest Communities
4 - FOR 253 Forest Mensuration
1 - FOR 254 Forest Products
7

Bachelor of Science

Freshman Year
First Semester
5 - BIOL 110 Principles of Biology I
4 - CH 101 General Chemistry
1 - GEN 101 Careers in Biochem. and Genetics
4 - MTHSC 106 Calculus of One Variable I
14

Second Semester
5 - BIOL 111 Principles of Biology II
4 - CH 102 General Chemistry
3 - ENGL 103 Accelerated Composition
4 - MTHSC 108 Calculus of One Variable II
16

Sophomore Year
First Semester
3 - CH 223 Organic Chemistry
1 - CH 227 Organic Chemistry Lab.
3 - COMM 150 Intro. to Human Comm. or
3 - COMM 250 Public Speaking
3 - GEN 302 Molecular and General Genetics
3 - PHYS 122 Physics with Calculus I
1 - PHYS 124 Physics Lab. I
14

Second Semester
3 - BIOCH 301 Molecular Biochemistry
1 - BIOCH 302 Molecular Biochemistry Lab.
3 - CH 224 Organic Chemistry
1 - CH 228 Organic Chemistry Lab.
3 - EX ST 301 Introductory Statistics
3 - Arts and Humanities (Literature) Requirement
3 - Social Science Requirement
17

College of Agriculture, Forestry, and Life Sciences
Horticulture

Bachelor of Science

Horticulture is the art, science, and business of food crops, ornamental plants, and turfgrasses and their production, utilization, and maintenance. A strong foundation in the basic sciences and humanities is built on courses in mathematics, chemistry, botany, physics, computer science, communications, economics, and humanities. Horticulture as a science depends on disciplines such as plant pathology, plant physiology, entomology, forestry, agronomy, soils, agricultural engineering, and agricultural economics. Business courses contribute to a well-rounded curriculum. A growing aspect of horticulture involves the management of enterprises, from production to distribution and marketing. Horticulture as an art involves the arrangement of plants in an aesthetically pleasing fashion.

Students begin professional development as undergraduates. An internship in a horticultural enterprise is required. Students considering graduate school are advised to take optional courses in the basic sciences as well as conduct an undergraduate research project. Those with strong interests in specific disciplines may complete special problems under the supervision of a faculty member.

Freshman Year

First Semester
3 - BIOL 103 General Biology I
1 - BIOL 105 General Biology Lab. I
3 - HORT 101 Horticulture
3 - MTHSC 101 Essential Math. for Informed Soc.
3 - ENGL 103 Accelerated Composition
2 - GEN 450 Comparative Genetics
2 - GEN 491 Special Problems in Genetics
2 - Elective

Second Semester
1 - HORT 306 Plant Propagation Techniques Lab.
3 - HORT 305 Plant Propagation
3 - CH 105 Chemistry in Context I
3 - BIOL 104 General Zoology
3 - BIOSC 401 Plant Physiology
3 - BIOCH 423, 431, 432, BIOSC 335, 401, 432, 440, 459, 475, or MICRO 416. Other courses must be approved by advisor.
2 - ENGL 314 Technical Writing
3 - BIOSC 461 Cell Biology
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Social Science Requirement
3 - Spanish Language Requirement

Sophomore Year

First Semester
4 - CH 105 Chemistry in Context I
3 - HORT 303 Landscape Plants
3 - Business Requirement
4 - Plant Biology Requirement

Second Semester
4 - CH 106 Chemistry in Context II
3 - HORT 304 Annuals and Perennials
3 - HORT 305 Plant Propagation
1 - HORT 306 Plant Propagation Techniques Lab.
3 - Arts and Humanities (Literature) Requirement

Summer
3 - HORT 271 Internship or
3 - HORT 471 Advanced Internship

Microbiology

Bachelor of Science

Microbiology deals with the study of bacteria, viruses, yeasts, filamentous fungi, protozoa, and unicellular algae. Microbiologists seek to describe these organisms in terms of their structures, functions, and processes of reproduction, growth, and death at both the cellular and molecular levels. They are also concerned with their ecology, particularly in regard to their pathological effects on man, and with their economic importance.

The Microbiology major provides a thorough training in the basic microbiological skills. Further, students receive instruction in mathematics, physics, chemistry, and biochemistry, all essential to the training of a modern microbiologist. Students can prepare for a variety of careers through a wide choice of electives. The Microbiology curriculum with a Biomedicine Concentration is recommended for students planning postgraduate programs. Microbiology graduates may enter graduate school in microbiology, biochemistry, bioengineering, or related disciplines; they may enter medical or dental schools.
or pursue careers in one of the many industries or public service departments dependent upon microbiology. Some of these are the fermentation and drug industries, medical and public health microbiology, various food industries, and agriculture.

Microbiology majors planning to apply for admission to a medical or dental school should inform their advisors immediately upon entering the program.

**Freshman Year**

**First Semester**
1. BIOL 110 Principles of Biology I
2. CH 101 General Chemistry
3. COMM 150 Intro. to Human Communication
4. MICRO 101 Microbes and Human Affairs
5. MTHSC 106 Calculus of One Variable I

**Second Semester**
1. BIOL 111 Principles of Biology II
2. CH 102 General Chemistry
3. ENGL 103 Accelerated Composition
4. Mathematics Requirement
5. Elective

**Sophomore Year**

**First Semester**
1. PHYS 210 General Physics II Lab.
2. PHYS 208 General Physics II
3. MICRO 415 Microbial Genetics
4. MICRO 412 Bacterial Physiology
5. Elective

**Second Semester**
1. PHYS 210 General Physics II Lab.
2. MICRO 493 Senior Seminar
3. MICRO 411 Pathogenic Bacteriology
4. Microbiology Requirement
5. Elective

**Junior Year**

**First Semester**
1. GEN 302 Molecular and General Genetics
2. GEN 303 Molecular and General Genetics
3. MICRO 401 Microbial Diversity and Ecology
4. MICRO (AVS, BIOSC) 414 Basic Immunology
5. PHYS 207 General Physics I and
6. PHYS 209 General Physics I Lab.
7. PHYS 122 Physics with Calculus I and
8. PHYS 124 Physics Lab. I

**Second Semester**
1. ENGL 314 Technical Writing
2. MICRO 412 Bacterial Physiology
3. MICRO 415 Microbial Genetics
4. PHYS 208 General Physics II and
5. PHYS 210 General Physics II Lab.
6. PHYS 221 Physics with Calculus II and
7. PHYS 223 Physics Lab. II

**Senior Year**

**First Semester**
1. GEN 302 Molecular and General Genetics
2. GEN 303 Molecular and General Genetics
3. MICRO 401 Microbial Diversity and Ecology
4. MICRO (AVS, BIOSC) 414 Basic Immunology
5. PHYS 207 General Physics I and
6. PHYS 209 General Physics I Lab.
7. PHYS 122 Physics with Calculus I and
8. PHYS 124 Physics Lab. I

**Second Semester**
1. PHYS 210 General Physics II Lab.
2. MICRO 493 Senior Seminar
3. MICRO 411 Pathogenic Bacteriology
4. Microbiology Requirement
5. Social Science Requirement

**BIOMEDICINE CONCENTRATION**

**Freshman Year**

**First Semester**
1. BIOL 110 Principles of Biology I
2. CH 101 General Chemistry
3. COMM 150 Intro. to Human Communication
4. MICRO 101 Microbes and Human Affairs
5. MTHSC 106 Calculus of One Variable I

**Second Semester**
1. BIOL 111 Principles of Biology II
2. PHYS 209 General Physics I Lab.
3. PHYS 209 General Physics I Lab.
4. PHYS 122 Physics with Calculus I and
5. PHYS 124 Physics Lab. I
6. Microbiology Requirement

**Sophomore Year**

**First Semester**
1. CH 223 Organic Chemistry
2. CH 227 Organic Chemistry Lab.
3. MICRO 401 Microbial Diversity and Ecology
4. Arts and Humanities (Literature) Requirement
5. Elective

**Second Semester**
1. ENGL 314 Technical Writing
2. MICRO 412 Bacterial Physiology
3. MICRO 415 Microbial Genetics
4. PHYS 208 General Physics II and
5. PHYS 210 General Physics II Lab.
6. PHYS 221 Physics with Calculus II and
7. PHYS 223 Physics Lab. II

**College of Agriculture, Forestry, and Life Sciences**
PACKAGING SCIENCE

Bachelor of Science
The Bachelor of Science degree in Packaging Science prepares students for careers in industries producing and utilizing packages for all types of products. Packaging is an essential part of industrialized economies, protecting, preserving, and helping to market products. The field of packaging is highly competitive and highly innovative, requiring an ever-increasing number of professional positions.

Opportunities for employment include a wide variety of career paths such as manufacturing, marketing, sales, design, purchasing, quality assurance, and customer services. Most career opportunities are in positions requiring technical knowledge combined with marketing and management skills.

The core curriculum assures graduates of having the skills and knowledge required by most entry-level packaging positions. Emphasis area choices or approved minors allow students to select courses to improve career preparation for specific industry segments, including distribution and transportation, engineering technology, food and health care packaging, graphic communications, materials, business administration, entrepreneurship, environmental engineering, environmental science and policy, and management.

Students changing majors to Packaging Science must have at least a 2.0 cumulative grade-point ratio.

Freshman Year
First Semester
3 - BIOL 103 General Biology I
1 - BIOL 105 General Biology Lab. I
4 - CH 101 General Chemistry
4 - MTHSC 106 Calculus of One Variable I
1 - PKGSC 101 Packaging Orientation
3 - Social Science Requirement

Second Semester
3 - CTE 180 Intro. to Tech. Drawing and CAD
3 - PHYS 208 General Physics II and
1 - PHYS 210 General Physics II Lab. or
3 - PHYS 221 Physics with Calculus II and
1 - PHYS 223 Physics Lab. II
3 - PKGSC 201 Packaging Perishable Products
3 - PKGSC 204 Container Systems
1 - PKGSC 206 Container Systems Lab.
1 - Departmental Requirement

Summer
0 - CO-OP 101 Cooperative Education

Junior Year
First Semester
3 - PKGSC 320 Package Design Fundamentals
3 - PKGSC 368 Packaging and Society
3 - PKGSC 430 Converting for Flexible Packaging
3 - PKGSC 440 Packaging for Distribution
3 - Emphasis Area Requirement

Second Semester
3 - ENGL 314 Technical Writing
3 - PKGSC 401 Packaging Machinery
3 - PKGSC 404 Mechanical Properties of Packages and Principles of Protective Packaging
1 - PKGSC 454 Product and Package Eval. Lab.
3 - Arts and Humanities (Literature) Requirement
3 - Emphasis Area Requirement

Senior Year
First Semester
3 - EX ST 301 Introductory Statistics
4 - PKGSC 416 Appl. of Polymers in Packaging
4 - PKGSC 464 Food and Health Care Pkg. Syst.
3 - Emphasis Area Requirement

Second Semester
3 - AP EC 202 Agricultural Economics or
3 - ECON 211 Principles of Microeconomics
1 - PKGSC 403 Packaging Career Preparation
3 - PKGSC 420 Package Design and Development
3 - Arts and Humanities (Non-Lit.) Requirement
6 - Emphasis Area Requirement

123 Total Semester Hours

* A C or better is required in this course for graduation.

Notes: General Education Requirements: Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement. Social Science Requirement must be in an area other than economics. A 200-level or higher foreign language course is recommended to satisfy the Arts and Humanities (Non-Literature) Requirement.

Students interested in minors or emphasis areas should take any prerequisites in the sophomore year.

* See advisor.

† At least one 15-week period (six months preferred) of Coop.

‡ Completion of an approved minor or emphasis area is required.

§ Approved minors are Business Administration, Entrepreneurship, Environmental Engineering, Environmental Science and Policy, Management.

Emphasis Areas consist of 15 credit hours selected from one of the following areas:

Distribution and Transportation—C E 255, 311, 410, 411, (C R P) 412, MGT 353, 317, 423, 424, 426

Engineering Technology—AG M 205, 406, 460, C E 253, CTE 181, 220, 250, 420, E G 209, ENGR 120, 130

Food and Health Care Packaging—BIO E 302, 320, 401, FD SC 214, 401, 402, 404, MICRO 305, 407

Graphic Communications—G C 207, 215, 245, 310, 405, 406, 407, 440, 446

Materials—BIO E 302, C M E 210, 241, 319, FOR 441, 442, PKGSC 471, TEXT 176

‡ PKGSC 404 and 454 must be taken concurrently.

PREPROFESSIONAL HEALTH STUDIES

Non-degree
The health professions need individuals with a diversity of educational backgrounds and a wide variety of talents and interests. The philosophies of education, the specific preprofessional course requirements, the noncognitive qualifications for enrollment, and the systems of training vary among the professional health schools; but all recognize the desirability of a broad education—a good foundation in the natural sciences, highly developed communication skills, and a solid background in the humanities and social sciences.

The absolute requirements for admission to professional health schools are limited to allow latitude for developing individualized undergraduate programs of study; however, most schools of medicine and dentistry require 16 semester hours of chemistry, including organic chemistry, eight hours of biological sciences, eight hours of physics, and six hours of mathematics. These requirements should be balanced with courses in vocabulary building, the humanities, and social sciences. The basic requirements in the natural sciences and as many of the courses in the humanities and social sciences as possible should be completed by the third year so that students will be prepared to take the Dental Admission Test or the Medical College Admission Test prior to applying to a professional school.

Undergraduates may also prepare to study optometry, podiatry, and other health professions. While the basic requirements for these professional schools are essentially the same as those for schools of medicine and dentistry, specific requirements for individual schools in these professions vary somewhat; consequently, interested students are advised to consult with the chief health professionals advisor.

At Clemson, rather than having a separate, organized preprofessional health study program, students are allowed to major in any curriculum, as long as the basic entrance requirements of the professional health school are fulfilled. These schools are not as concerned about a student’s major as they are about academic performance in whichever curriculum the student chooses. Professional health schools have neither preferences nor prejudices concerning any curriculum, which is evidenced by the fact that their entering students represent a broad spectrum of curricula. The emphasis is placed on the student’s doing well in the curriculum chosen, and this becomes critical as competition increases for the limited number of places available in professional health schools.
PREPHARMACY

The two-year Prepharmacy program requires of 66–72 credit hours depending on the pharmacy school of interest. Upon completion of the program, students will be eligible to apply to a college of pharmacy, usually the South Carolina College of Pharmacy (MUSC and USC campuses), and may be eligible to apply for the Bachelor of Science in Preprofessional Studies5. The degree in Pharmacy is awarded by the institution attended. It is important for students to work closely with their advisor as there are variations in courses required by the pharmacy schools.

For financial aid purposes, students in the Prepharmacy program are considered to be enrolled in a degree-seeking program.

First Year
First Semester
3 - BIOL 103 General Biology I
1 - BIOL 105 General Biology Lab. I
4 - CH 101 General Chemistry
4 - MTHSC 106 Calculus of One Variable I
3 - PSYCH 201 Introduction to Psychology
3 - Arts and Humanities (Non-Lit.) Requirement1
18

Second Semester
3 - BIOL 104 General Biology II
1 - BIOL 106 General Biology Lab. II
4 - CH 102 General Chemistry
3 - ECON 200 Economic Concepts
3 - ENGL 103 Accelerated Composition
3 - EX ST 301 Introductory Statistics
1 - Elective
18

Second Year
First Semester
4 - BIOSC 222 Human Anatomy and Phys. I or
4 - MICRO 305 General Microbiology3
3 - CH 223 Organic Chemistry
1 - CH 227 Organic Chemistry Lab.
3 - PHYS 207 General Physics I
1 - PHYS 209 General Physics I Lab.
3 - Arts and Humanities (Literature) Requirement1
3 - History Requirement6
18

Second Semester
3 - AG ED 200 Agricultural Applications of Educational Technology or
3 - CP SC 120 Intro. to Information Tech.
3 - CH 224 Organic Chemistry
1 - CH 228 Organic Chemistry Lab.
3 - COMM 150 Intro. to Human Comm. or
3 - COMM 250 Public Speaking
3 - PHYS 208 General Physics II
1 - PHYS 210 General Physics II Lab.
3 - Science and Tech. in Society Requirement1
1 - Elective
18

Third Year6
72–90 Total Semester Hours

1See General Education Requirements.
2Select any ENGL course from General Education Arts and Humanities (Literature) Requirement1.
3See advisor.

PREHABILITATION SCIENCES

The Prehabilitation Sciences major includes concentrations in physical therapy, occupational therapy, communication sciences and disorders, as well as in physician assisting and allied health areas. This curriculum is designed to meet the requirements of the programs in the College of Health Professions at the Medical University of South Carolina and other professional schools. The program requires a minimum of 90 semester hours of undergraduate coursework. In addition, students must apply to a professional school for acceptance into its program.

Because preparation for some of the concentrations, such as the physical therapy, occupational therapy, and communication sciences and disorders programs at MUSC, requires a baccalaureate degree in any area, students are advised to select a major with similar requirements after consultation with the Prehabilitation Sciences advisor. The following curriculum fulfills the general requirements for those fields, requiring less than a baccalaureate degree. Electives should be chosen after consultation with the advisor. Professional schools may change their requirements at any time, so it is imperative that students in this major stay in close contact with their advisor.

For financial aid purposes, students in the Prehabilitation Sciences program are considered to be enrolled in a degree-seeking program.

First Year
First Semester
3 - BIOL 103 General Biology I
1 - BIOL 105 General Biology Lab. I
4 - CH 101 General Chemistry
4 - MTHSC 106 Calculus of One Variable I
3 - PSYCH 201 Introduction to Psychology
3 - Arts and Humanities (Non-Lit.) Requirement1
18

Second Semester
3 - BIOL 104 General Biology II
1 - BIOL 106 General Biology Lab. II
4 - CH 102 General Chemistry
3 - ECON 200 Economic Concepts
3 - ENGL 103 Accelerated Composition
3 - EX ST 301 Introductory Statistics
3 - SOC 201 Introduction to Sociology
1 - Elective
18

Second Year
1 - Elective

Second Semester
3 - BIOL 104 General Biology II
1 - BIOL 106 General Biology Lab. II
4 - CH 102 General Chemistry
3 - ENGL 103 Accelerated Composition
3 - EX ST 301 Introductory Statistics
3 - SOC 201 Introduction to Sociology
1 - Elective
18

PREVETERINARY MEDICINE

Under a regional plan, the South Carolina Preveterinary Advisory Committee coordinates a program for South Carolina residents who are interested in pursuing careers in veterinary medicine. South Carolina residents attending any college or university may apply through the Veterinary Medical College Application Service (VMCAS) to the University of Georgia College of Veterinary Medicine. Currently the University of Georgia admits up to 17 students each year through arrangements with the Southern Regional Education Board. The State of South Carolina has a contract with Mississippi State University to admit up to five South Carolina residents. The State of South Carolina also has a contract with Tuskegee University to admit up to four South Carolina residents. Application must be made directly to Tuskegee University.

Minimum requirements for admission to a college of veterinary medicine generally include the satisfactory completion of prescribed courses in a well-rounded undergraduate degree program. Specific requirements for admission to the University of Georgia College of Veterinary Medicine include the following undergraduate courses: six credits of English, 14 credits of humanities and social studies, eight of physics, eight of general biology, eight credits of advanced biology, three credits of biochemistry, and 16 credits of organic and inorganic chemistry. (Chemistry and physics courses must be at the pre-medical level; they may not be survey courses.)
To be in the best competitive position, applicants should complete courses in animal agriculture, genetics, nutrition, biochemistry, and advanced biology. Considerations for selection are character, scholastic achievement, personality, experience with large and small animals, general knowledge, and motivation. In the past, competition has been keen, and only those applicants who have shown exceptional ability have been admitted. Specific considerations may include a minimal grade-point average and completion of standardized tests such as the Graduate Record Examination and the Veterinary College Admission Test.

Since out-of-state students attending Clemson are ineligible to apply to the University of Georgia or Tuskegee University under the South Carolina quota, they should contact the college(s) of veterinary medicine to which they plan to apply. They may apply at the University of Georgia for at-large admission.

Veterinary schools accept students with a broad range of academic backgrounds; therefore, it is recommended that the beginning university student select any undergraduate major and simultaneously complete the courses required for veterinary school entrance and those required for completion of a BS or BA degree. For students selecting Animal and Veterinary Sciences or Biological Sciences at Clemson University, the basic curricula have been designed to accommodate Georgia's entrance requirements. Further information is available from the Department of Animal and Veterinary Sciences at 864-656-3427.

SOILS AND SUSTAINABLE CROP SYSTEMS

Bachelor of Science

The BS degree program in Soils and Sustainable Crop Systems is a multidisciplinary program that educates students with expertise in soils, crop sciences, and applied agricultural biotechnology. It offers students a rigorous, science-based degree with educational opportunities related to management of agricultural commodities and natural resources as well as soil and water resources.

Students can tailor the program to fit their professional and academic goals by selecting one of three concentrations with emphasis areas. The Agricultural Biotechnology concentration integrates conventional disciplines with molecular advances in plants, pathogens, and bio system interactions and responds to the educational void between the rapid development of biotechnology products into agricultural production and the intermediate- and end-users, farmers, and consumers. Graduates in this concentration will be competitive as scientists in emerging agricultural biotechnology industries, as educators, and as policy makers and officers in regulatory agencies.

Students with a concentration in Soil and Water Environmental Science can address compelling problems including land application of agricultural and industrial wastes, reduction of contamination of ground and surface waters, establishment of functional septic drain fields, and production of food and fiber crops. Graduates will be able to establish careers in traditional agrarian fields such as soil scientists and conservationists, extension agents, and farm consultants and in the broader environmental arenas of DHEC, consulting engineering firms, and environmental consulting. Graduates will be well prepared for graduate work in fields ranging from soil science to environmental engineering and law.

Students with a concentration in Sustainable Crop Production will graduate with comprehensive knowledge to increase farm profits by decreasing the costs of crop and production; build soil tilth and fertility through rotations, multiple cropping, and nutrient cycling; protect the environment by minimizing or more efficiently using synthetic agrichemicals; manage crop pests and weeds with integrated, ecologically sound strategies; develop strategies for profitable marketing of agricultural commodities; and create a strong, diversified agriculture that is stable through market and weather fluctuations. Graduates can assume positions as self-employed farmers, farm managers, state and federal natural resource managers, research technicians, agricultural industry employees, greenhouse managers, consultants in pest management and sustainable agriculture, field ecology professionals, agritourism industry specialists, extension personnel, or regulatory officers.

AGRICULTURAL BIOTECHNOLOGY CONCENTRATION

Sophomore Year

First Semester
1. CH 223 Organic Chemistry
2. CH 227 Organic Chemistry Lab.
3. COMM 250 Public Speaking
4. ECON 200 Economic Concepts or ECON 211 Principles of Microeconomics
5. SSCS 333 Agricultural Genetics

Second Semester
1. AP EC 205 Agriculture and Society
2. BIOSC 335 Evolutionary Biology
3. CH 224 Organic Chemistry
4. CH 228 Organic Chemistry Lab.
5. GEN 300 Fundamental Genetics

Junior Year

First Semester
1. BIOCH 305 Essential Elements of Biochem.
2. BIOCH 306 Essential Elements of Bioch. Lab.
3. BIOSC 304 Biology of Plants
4. CSENV 422 Major World Crops
5. SSCS 335 Agricultural Biotechnology
6. Social Science Requirement

Second Semester
1. CSENV 350 Practicum
2. ENGL 314 Technical Writing
3. PL PA 310 Plant Diseases and People
4. PL PH (BIOSC) 340 Plant Med. and Magic
5. SSCS 401 Academic and Professional Dev. II
6. Emphasis Area Requirement

Senior Year

First Semester
1. CSENV 350 Practicum
2. BIOSC 401 Plant Physiology
3. BIOSC 402 Plant Physiology Lab.
4. CSENV 350 Practicum
5. ENT (BIOSC) 301 Insect Biology and Diversity
6. SSCS 445 Regulatory Issues and Policies
7. SSCS 450 Agric. Biosystems and Risk Assess.
8. Emphasis Area Requirement

Second Semester
1. CSENV 350 Practicum
2. CSENV 417 Weed Ecology and Morphology
3. SSCS 451 Agric. Biotech. and Global Society
4. Emphasis Area Requirement

124–126 Total Semester Hours

1ECON 200 is recommended for students in the Agricultural Biosystems and Technology Emphasis Area. ECON 211 is recommended for students in the Agricultural Biotechnology and Global Society Emphasis Area.

2See General Education Requirements.

3See General Education Requirements.
SOIL AND WATER ENVIRONMENTAL SCIENCE CONCENTRATION

Sophomore Year

First Semester
1. CH 223 Organic Chemistry and
2. CH 227 Organic Chemistry Lab. or
3. CH 201 Survey of Organic Chemistry
4. CSENV 202 Soils
5. GEO 101 Physical Geology
6. GEOL 103 Physical Geology Lab.
7. PHYS 207 General Physics I and
8. PHYS 209 General Physics I Lab. or
9. PHYS 122 Physics with Calculus I and
10. PHYS 124 Physics Lab. I
16

Second Semester
1. PHYS 208 General Physics II and
2. PHYS 210 General Physics II Lab. or
3. PHYS 221 Physics with Calculus II and
4. PHYS 223 Physics Lab. II
5. Arts and Humanities (Literature) Requirement
6. Cross-Cultural Awareness Requirement
7. Emphasis Area Requirement
8
14

Junior Year

First Semester
1. COMM 250 Public Speaking
2. MICRO 305 General Microbiology
3. Plant Science Requirement
4

Second Semester
1. CSENV 475 Soil Physics and Chemistry
2. CSENV 490 Beneficial Soil Organisms in Plant Growth
3. ENGL 314 Technical Writing
4. SS 401 Academic and Professional Dev. II
5. Emphasis Area Requirement
6. Social Science Requirement
7
16

Senior Year

First Semester
1. CSENV 350 Practicum
2. CSENV 403 Soil Genesis and Classification
3. CSENV 455 Seminar
4. Social Science Requirement
5
15

Second Semester
1. AGRIC (EN SP) 315 Environment and Agric.
2. BIOSC 401 Plant Physiology
3. BIOSC 402 Plant Physiology Lab.
4. CSENV (B E) 408 Land Treatment of Wastewater and Sludges
5. Emphasis Area Requirement
6. Social Science Requirement
7
16

Second Semester
1. AGRIC (EN SP) 315 Environment and Agric.
2. BIOSC 401 Plant Physiology
3. BIOSC 402 Plant Physiology Lab.
4. CSENV (B E) 408 Land Treatment of Wastewater and Sludges
5. Emphasis Area Requirement
6
15-16

See General Education Requirements.

SUSTAINABLE CROP PRODUCTION CONCENTRATION

Sophomore Year

First Semester
1. AP EC 202 Agricultural Economics
2. CH 223 Organic Chemistry
3. CH 227 Organic Chemistry Lab.
4. CSENV 202 Soils
5. PL PA 310 Plant Diseases and People
14

Second Semester
1. AP EC 205 Agriculture and Society
2. CH 224 Organic Chemistry
3. CH 228 Organic Chemistry Lab.
4. COMM 250 Public Speaking
5. SS 333 Agricultural Genetics
6. Plant Science Requirement
16

Junior Year

First Semester
4. ENT (BIOSC) 301 Insect Biology and Diversity
5. I P M 401 Principles of Integrated Pest Mgmt.
6. Emphasis Area Requirement
7. Plant Science Requirement
8. Social Science Requirement
9
16

Second Semester
3. BIOSC 401 Plant Physiology
5. CSENV 405 Plant Breeding
6. CSENV 407 Introductory Weed Science
7. ENGL 314 Technical Writing
8. PL PA 411 Plant Disease Diagnosis I
9. SS 401 Academic and Professional Dev. II
10

Senior Year

First Semester
3. CSENV 417 Weed Ecology and Morphology
4. CSENV 490 Beneficial Soil Organisms in Plant Growth
5. ENT 401 Insect Pests of Ornamental Plants and Shade Trees or
6. ENT 407 Applied Agricultural Entomology
7. Emphasis Area Requirement
8
15-16

Second Semester
4. CH 105 Chemistry in Context I
5. HORT 212 Introduction to Turfgrass Culture
6. HORT 213 Turfgrass Culture Lab.
7. HORT 303 Landscape Plants
8. Plant Biology Requirement
9
15

Second Semester
4. CH 106 Chemistry in Context II
5. Applied Science Requirement
6. Arts and Humanities (Literature) Requirement
7. Business Requirement
8. Spanish Language Requirement
9
16

See General Education Requirements.

TURFGRASS Bachelor of Science

The Turfgrass program is designed for students interested in careers in the rapidly growing turfgrass industry. The curriculum includes courses in turfgrass management, pathology, agricultural mechanization, personnel management, soil fertility, soil microbiology, weed control, and park and recreation management. Graduates pursue careers in professional lawn care; maintenance of parks, athletic fields, and golf courses; production and sale of seed, sod, supplies, and equipment; or as technicians for businesses or government agencies.

Freshman Year

First Semester
1. BIOL 103 General Biology I
2. BIOL 105 General Biology Lab. I
3. HORT 101 Horticulture
4. MTHSC 102 Intro. to Mathematical Analysis
5. Arts and Humanities (Non-Lit.) Requirement
6. Social Science Requirement
7
16

Second Semester
1. ENGL 103 Accelerated Composition
2. HORT 102 Experience Horticulture
3. MTHSC 101 Essential Math for Informed Soc.
4. Laboratory Science Requirement
5. Social Science Requirement
6
14

Sophomore Year

First Semester
4. CH 105 Chemistry in Context I
5. HORT 212 Introduction to Turfgrass Culture
6. HORT 213 Turfgrass Culture Lab.
7. HORT 303 Landscape Plants
8. Plant Biology Requirement
9
15

Second Semester
4. CH 106 Chemistry in Context II
5. Applied Science Requirement
6. Arts and Humanities (Literature) Requirement
7. Business Requirement
8. Spanish Language Requirement
9
16

See General Education Requirements.
Summer
3 - HORT 271 Internship\(^1\) or
3 - HORT 471 Advanced Internship\(^1\)

Junior Year
First Semester
4 - CSENV 202 Soils
3 - Advanced Writing Requirement\(^1\)
3 - Applied Science Requirement\(^2\)
3 - Business Requirement\(^2\)

Second Semester
3 - BIOSC 401 Plant Physiology
1 - BIOSC 402 Plant Physiology Lab.
1 - HORT 409 Seminar
3 - HORT 420 Applied Turfgrass Physiology
2 - PL PA (ENT) 406 Diseases and Insects of Turfgrasses
3 - Horticulture Specialization Requirement\(^2\)
3 - Oral Communication Requirement\(^1\)

Maymester
1 - PL PA (ENT) 408 Diseases and Insects of Turfgrasses Lab.

Senior Year
First Semester
3 - HORT 412 Advanced Turfgrass Management
3 - Horticulture Specialization Requirement\(^2\)
4 - Laboratory Science Requirement\(^1\)
3 - Soils Requirement\(^2\)

Second Semester
3 - HORT (CSENV) 433 Landscape and Turf Weed Management
3 - Applied Science Requirement\(^1\)
3 - Business Requirement\(^2\)
3 - Horticulture Specialization Requirement\(^2\)
3 - Soils Requirement\(^2\)

122 Total Semester Hours

\(^1\)See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement.

\(^2\)See advisor. Select from department-approved list.

\(^3\)Internship must be completed in one or two semesters. Internship may be done fall, spring, or summer after completing HORT 212/213. Prior approval is required for internships, and a 2.0 grade-point ratio is required for registration.

Note: Turfgrass majors must make a C or better in all HORT-designated courses. Courses may be repeated as often as necessary to achieve the minimum grade.

WILDLIFE AND FISHERIES BIOLOGY

Bachelor of Science
Increased interest in conservation of natural resources and the environment and demand for seafood products have resulted in these areas becoming increasingly technical and requiring highly qualified wildlife and fisheries biologists. Greatest demands for graduates are in the areas of management, research, survey, and regulatory positions with state and federal agencies; industrial research and quality control laboratories; conservation, recreational, and other public service agencies; and private enterprises.

The Bachelor of Science degree program in Wildlife and Fisheries Biology provides a solid foundation for many careers in the sciences. The curriculum is strong in basic and applied sciences, communication skills, and the social sciences. In addition, three credit hours are available for field training with appropriate natural resource agencies. Students may satisfy coursework requirements for professional certification by the Wildlife Society and/or the American Fisheries Society.

Combined Bachelor of Science/Master of Science Degree Program
Under this plan, students may reduce the time necessary to earn both degrees by applying graduate credits to both undergraduate and graduate program requirements. Students are encouraged to obtain the specific requirements for the dual degree from the Department of Forestry and Natural Resources as early as possible in their undergraduate program as a number of required courses have prerequisites not normally taken by Wildlife and Fisheries Biology majors. Enrollment guidelines and procedures can be found under Academic Regulations in this catalog.

Freshman Year
First Semester
3 - BIOL 103 General Biology I
1 - BIOL 105 General Biology Lab. I
4 - CH 105 Chemistry in Context I\(^1\)
1 - E N R 101 Intro. to Env. and Natural Res. I
3 - MTHSC 102 Intro. to Mathematical Analysis
3 - Elective
15

Second Semester
3 - BIOL 104 General Biology II
1 - BIOL 106 General Biology Lab. II
4 - CH 106 Chemistry in Context II\(^1\) or
4 - PHYS 200 Introductory Physics\(^1\)
3 - CP SC 120 Intro. to Information Technology
3 - ENGL 103 Accelerated Composition
1 - F N R 102 FNR Freshman Portfolio
15

Sophomore Year
First Semester
4 - CSENV 202 Soils
2 - FOR 205 Dendrology
3 - FOR 221 Forest Biology
3 - W F B 300 Wildlife Biology Lab.
1 - W F B 301 Wildlife Biology Lab.
3 - Arts and Humanities (Literature) Requirement\(^2\)
16

Second Semester
3 - BIOSC 303 Vertebrate Biology
3 - COMM 250 Public Speaking
3 - W F B 350 Principles of Fish and Wildlife Biol.
3 - Arts and Humanities (Non-Lit.) Requirement\(^2\)
3 - Social Science Requirement\(^2\)
15

Junior Year
First Semester
3 - AP EC 257 Natural Resources, Environment, and Economics
4 - BIOSC 320 Field Botany
3 - ENGL 314 Technical Writing
3 - GEN 300 Fundamental Genetics
3 - W F B 462 Wetland Wildlife Biology
16

Second Semester
3 - E N R 302 Natural Resources Measurements
3 - EX ST 301 Introductory Statistics
3 - W F B (BIOSC) 313 Conservation Biology
3 - W F B 410 Wildlife Management Techniques
3 - Approved Requirement\(^3\)
15

Senior Year
First Semester
4 - AVS 301 Anat. and Phys. of Domestic Animals
3 - W F B 412 Wildlife Management
3 - Approved Requirement\(^3\)
3 - Ecology Requirement\(^4\)
3 - Policy and Law Requirement\(^1\)
16

Second Semester
1 - F N R 499 Natural Resources Seminar
3 - W F B 416 Fishery Biology
3 - W F B 440 Non-Game Wildlife Management
1 - W F B 498 Senior Portfolio
6 - Approved Requirement\(^7\)
14

122 Total Semester Hours

\(^1\)Students planning to take organic chemistry should substitute CH 101 and 102.

\(^2\)See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement; and, if CH 105 is not selected, three credits must also satisfy the Science and Technology in Society Requirement. (Note: Social Science Requirement must be in an area other than economics.)

\(^3\)Select from department-approved list.

\(^4\)BIOSC 441, 443, 446, or FOR 315
MINORS

Following are minors acceptable for students in the College of Agriculture, Forestry, and Life Sciences. Students cannot major and minor in the same field or acquire a minor that is not allowed by the degree program.

Accounting
Adult/Extension Education
Aerospace Studies
Agricultural Business Management
Agricultural Mechanization and Business
American Sign Language Studies
Animal and Veterinary Sciences
Anthropology
Athletic Leadership
Biochemistry
Bioengineering
Biological Sciences
Business Administration
Chemistry
Cluster
Communication Studies
Community Recreation Management
Computer Science
Crop and Soil Environmental Science
East Asian Studies
Economics
Education
English
Entomology
Entrepreneurship
Environmental Engineering
Environmental Science and Policy
Equine Business—*not open to Animal and Veterinary Sciences majors*
Film Studies
Financial Management
Food Science
Forest Products
Forest Resource Management
Genetics
Geography
Geology
Global Politics
Great Works
Health Science
History
Horticulture—*not open to Turfgrass majors*

Human Resource Management
Legal Studies
Management
Mathematical Sciences
Microbiology
Military Leadership
Modern Languages
Music
Natural Resource Economics
Nonprofit Leadership
Operations Management
Packaging Science
Pan African Studies
Park and Protected Area Management
Philosophy
Physics
Plant Pathology
Political Science
Psychology
Public Policy
Religion
Russian Area Studies
Science and Technology in Society
Screenwriting
Sociology
Spanish-American Area Studies
Sport Management
Textiles
Theatre
Therapeutic Recreation
Travel and Tourism
Turfgrass—*not open to Horticulture majors*
Urban Forestry
Wildlife and Fisheries Biology
Women’s Studies
Writing

See pages 35–38 for details.