The mission of the College of Agriculture, Forestry and Life Sciences is to provide teaching, research, and service in agriculture, forestry, and life sciences that will benefit the citizens of South Carolina and the nation. The College of Agriculture, Forestry and Life Sciences serves more than 2,900 graduate and undergraduate students.

The ability to understand and manipulate the molecular structure of biological systems while at the same time understanding their practical management offers immense potential to improve our world, whether it is to improve foods, building products, the environment, or our health. The College of Agriculture, Forestry and Life Sciences is using the same expertise to produce more food on a shrinking globe; package environmentally sound products; grow better foods to fight breast cancer, prevent heart disease, and increase dairy production; increase timber production and provide new fuels; and develop businesses and promote a “green” society.

To assist students in achieving these goals, the William B. Bookholt Jr. Student Services Center provides academic advising and developmental services to promote success for students in the related degree programs. These services involve recruitment and retention, academic advising, multicultural affairs, study abroad, career development, and placement.

The College of Agriculture, Forestry and Life Sciences is impacting the world one graduate at a time—from cell research to food production to packaged materials to the globe—developing partnerships for the future to make the world greener, healthier, tastier, and wealthier.

### 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 62).

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.

In consultation with the departmental advisor, students choose one of the following emphasis areas: Communications, Leadership, or Teaching.

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>COMMUNICATIONS EMPHASIS AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Semester</strong></td>
<td><strong>Junior Year</strong></td>
</tr>
<tr>
<td>3 - AG ED 200 Agricultural Applications of Educational Technology¹ or ³</td>
<td>3 - AG M 221 Surveying</td>
</tr>
<tr>
<td>3 - Arts and Humanities (Non-Lit.) Requirement³</td>
<td>4 - COMM 201 Intro. to Communication Studies</td>
</tr>
<tr>
<td>3 - AVS 150 Introduction to Animal Science</td>
<td>4 - CSENV 202 Soils</td>
</tr>
<tr>
<td>1 - AVS 151 Introduction to Animal Science Lab.</td>
<td>3 - FOR 305 Woodland Management or ³</td>
</tr>
<tr>
<td>3 - BIOL 103 General Biology I</td>
<td>3 - W F B 412 Wildlife Management</td>
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<tr>
<td>1 - BIOL 105 General Biology Lab. I</td>
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<tr>
<td>3 - Mathematics Requirement²</td>
<td><strong>Second Semester</strong></td>
</tr>
<tr>
<td></td>
<td>3 - ED F 302 Educational Psychology</td>
</tr>
<tr>
<td></td>
<td>3 - HORT 305 Plant Propagation</td>
</tr>
<tr>
<td><strong>Second Semester</strong></td>
<td>1 - HORT 306 Plant Propagation Techniques Lab.</td>
</tr>
<tr>
<td>1 - AG ED 100 Orientation and Field Experience</td>
<td>3 - Advanced Writing Requirement³</td>
</tr>
<tr>
<td>3 - AG M 205 Principles of Fabrication</td>
<td>3 - Arts and Humanities (Non-Lit.) Requirement³</td>
</tr>
<tr>
<td>3 - AP EC 202 Agricultural Economics</td>
<td>3 - Departmental Communication Requirement¹</td>
</tr>
<tr>
<td>3 - BIOL 104 General Biology II</td>
<td>3 - Oral Communication Requirement³</td>
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<tr>
<td>1 - BIOL 106 General Biology Lab. II</td>
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<tr>
<td>3 - ENGL 103 Accelerated Composition</td>
<td><strong>Senior Year</strong></td>
</tr>
<tr>
<td>3 - Social Science Requirement²</td>
<td><strong>First Semester</strong></td>
</tr>
<tr>
<td></td>
<td>3 - ENGL 231 Introduction to Journalism</td>
</tr>
<tr>
<td></td>
<td>3 - HORT 303 Landscape Plants</td>
</tr>
<tr>
<td></td>
<td>6 - Departmental Communication Requirement¹</td>
</tr>
<tr>
<td></td>
<td>3 - Technical Requirement³</td>
</tr>
<tr>
<td></td>
<td>15</td>
</tr>
<tr>
<td></td>
<td><strong>Second Semester</strong></td>
</tr>
<tr>
<td></td>
<td>12 - AG ED 407 Internship in Extension and Leadership Education³</td>
</tr>
<tr>
<td></td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>129 Total Semester Hours</td>
</tr>
</tbody>
</table>

¹See General Education Requirements. COMM 150 or 250 is recommended.
²See General Education Requirements.
³See advisor.
⁴Students in the Communications and Leadership Emphasis Areas must take AG ED 200. Students in the Teaching Emphasis Area must take a course to satisfy the Arts and Humanities (Non-Literature) Requirement. See General Education Requirements.
⁵See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement. Note: ANTH 201, GEOG 103 or HIST 193 is recommended to satisfy the Social Science Requirement.
⁶Required of students in Communications Emphasis Area only.
⁷See advisor.

**LEADERSHIP EMPHASIS AREA**

<table>
<thead>
<tr>
<th>Junior Year</th>
<th><strong>First Semester</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>3 - AG M 221 Surveying</td>
<td>3 - HORT 305 Plant Propagation</td>
</tr>
<tr>
<td>4 - CSENV 202 Soils</td>
<td>1 - HORT 306 Plant Propagation Techniques Lab.</td>
</tr>
<tr>
<td>3 - FOR 305 Woodland Management or ³</td>
<td>3 - Advanced Writing Requirement³</td>
</tr>
<tr>
<td>3 - W F B 412 Wildlife Management</td>
<td>3 - Oral Communication Requirement³</td>
</tr>
<tr>
<td>3 - HORT 303 Landscape Plants</td>
<td>3 - Technical Requirement³</td>
</tr>
<tr>
<td>3 - Arts and Humanities (Non-Lit.) Requirement³</td>
<td>19</td>
</tr>
<tr>
<td><strong>Second Semester</strong></td>
<td><strong>Second Semester</strong></td>
</tr>
<tr>
<td>3 - ED F 302 Educational Psychology</td>
<td>3 - ED F 302 Educational Psychology</td>
</tr>
<tr>
<td>3 - HORT 305 Plant Propagation</td>
<td>3 - HORT 305 Plant Propagation Techniques Lab.</td>
</tr>
<tr>
<td>1 - HORT 306 Plant Propagation Techniques Lab.</td>
<td>3 - Advanced Writing Requirement³</td>
</tr>
<tr>
<td>3 - Oral Communication Requirement³</td>
<td>3 - Technical Requirement³</td>
</tr>
<tr>
<td><strong>Senior Year</strong></td>
<td>16</td>
</tr>
<tr>
<td>1 - HORT 306 Plant Propagation Techniques Lab.</td>
<td><strong>Senior Year</strong></td>
</tr>
<tr>
<td>3 - Arts and Humanities (Non-Lit.) Requirement³</td>
<td><strong>First Semester</strong></td>
</tr>
<tr>
<td></td>
<td>3 - ENGL 231 Introduction to Journalism</td>
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<tr>
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<td>3 - HORT 303 Landscape Plants</td>
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<td>6 - Departmental Communication Requirement¹</td>
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<td></td>
<td>3 - Technical Requirement³</td>
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<td>15</td>
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<tr>
<td></td>
<td><strong>Second Semester</strong></td>
</tr>
<tr>
<td></td>
<td>12 - AG ED 407 Internship in Extension and Leadership Education³</td>
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<tr>
<td></td>
<td>12</td>
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<td>129 Total Semester Hours</td>
</tr>
</tbody>
</table>

¹See General Education Requirements.
²See General Education Requirements. COMM 150 or 250 is recommended.
³See advisor.
⁴Students in the Communications and Leadership Emphasis Areas must take AG ED 200. Students in the Teaching Emphasis Area must take a course to satisfy the Arts and Humanities (Non-Literature) Requirement. See General Education Requirements.
⁵See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement. Note: ANTH 201, GEOG 103 or HIST 193 is recommended to satisfy the Social Science Requirement.
⁶Required of students in Communications Emphasis Area only.
⁷See advisor.
Senior Year
First Semester
3 - AG ED 415 Leadership of Volunteers
3 - AG ED 416 Ethics and Issues in Agriculture and the Food and Fiber System
3 - MGT 201 Principles of Management
3 - Technical Requirement
15

Second Semester
12 - AG ED 407 Internship in Extension and Leadership Education
12
127 Total Semester Hours

Sophomore Year
First Semester
3 - AP EC 202 Agricultural Economics
4 - CH 105 Chemistry in Context I
4 - PHYS 200 Introductory Physics or
3 - PHYS 207 General Physics I and
1 - PHYS 209 General Physics I Lab.
3 - Arts and Humanities (Non-Lit.) Requirement
14

Second Semester
3 - AG M 206 Machinery Management
3 - AG M 303 Calculations for Mechanized Agric.
4 - CH 106 Chemistry in Context II
4 - CSENV 202 Soils
2 - EG 209 Intro. to Engr./Comp. Graphics
16

Junior Year
First Semester
3 - AG M 221 Surveying
3 - AG M 301 Soil and Water Conservation
3 - AG M 460 Electrical Systems
3 - Arts and Humanities (Literature) Requirement
1 - Agribusiness Requirement
3 - Minor Requirement
1 - Elective
15

Second Semester
3 - AG M 406 Mechanical and Hydraulic Systems
3 - COMM 250 Public Speaking
3 - Agribusiness Requirement
3 - Minor Requirement
3 - Elective
15

Senior Year
First Semester
3 - AG M 410 Precision Agriculture Technology
3 - AG M 452 Mobile Power
3 - AG M 472 Capstone
3 - Agribusiness Requirement
3 - Plant/Crop Science Requirement
3 - Social Science Requirement
15

Second Semester
3 - AG M 402 Landscape Drainage and Irrigation
3 - AG M 405 Agricultural Structures and Environmental Control
3 - Minor Requirement
3 - Plant/Crop Science Requirement or
3 - Soil Science Requirement
15

123 Total Semester Hours

3ED F 315 may be substituted. In this case, ED F 425 must be taken in the semester immediately prior to directed teaching.
1ENG 304 or 314 is recommended.
2See General Education Requirements. COMM 150 or 250 is recommended.
3See advisor.

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 http://www.clemson.edu/cafls/departments/biosystemseng/agmec/index.html.

Freshman Year
First Semester
3 - AG ED 200 Agricultural Applications of Educational Technology or
1 - ED F 315 Technology Skills for Learning
3 - AG ED 303 Mech. Technology for Ag. Ed.
3 - AG M 221 Surveying
4 - CSENV 202 Soils
3 - FOR 305 Woodland Management or
3 - W F B 412 Wildlife Management
3 - HORT 303 Landscape Plants
17 or 19

Second Semester
3 - ED F 302 Educational Psychology
3 - HORT 305 Plant Propagation
1 - HORT 306 Plant Propagation Techniques Lab.
3 - Advanced Writing Requirement
3 - Oral Communication Requirement
3 - Technical Requirement
16

Second Semester
3 - ACCT 201 Financial Accounting Concepts
3 - BIOL 104 General Biology II
1 - BIOL 105 General Biology Lab. I
3 - MTHSC 102 Intro. to Mathematical Analysis

3See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement.
1AP EC 302, 308, 309, 319, 351, 402, 409, 452, 456, or 460. This course may also be used to satisfy minor requirement.
2See Agricultural Business Management minor or select other approved minor. If requirements for an approved minor have already been satisfied, this course must be any 300-level (or higher) course from an approved program.
3CSENV 405, 407, 417, 421, 422, 423, (AP EC) 426, HORT 212, 305, (CSENV) 453, 455, 456, PL PA 310, (ENT) 406, 411, or 459. This course may also be used to satisfy minor requirement.
4CSENV 403, 446, 452, (ENTUX, GEOL) 485, or 490. This course may also be used to satisfy minor requirement.
ANIMAL AND VETERINARY SCIENCES

Bachelor of Science
The Animal and Veterinary Sciences curriculum provides students with both a basic and applied understanding of the scientific principles needed for successful careers in the scientific, technical, and business phases of livestock and poultry production, processing, and marketing. Strengths of this program include extensive hands-on instruction at Clemson’s five animal farms, personalized advising, and the opportunity for valued-added experiences, including involvement in research, teaching, extension, international travel, and internships. Students choose from three concentrations.

The Animal Agriculture Concentration prepares students for careers in the many facets of the animal industries, including production, sales and marketing, business management, advertising, and extension. The Equine Business Concentration prepares students for such professions as trainers, managers, riding instructors, sales or media representatives, breed association representatives or for equine entrepreneurial careers such as owners of tack shops, boarding facilities, or riding schools. The Pre-veterinary and Science Concentration prepares students to meet the requirements for most veterinary schools, graduate schools, and medical and dental schools. Students with South Carolina residency may compete for contract seats at Mississippi State, Tuskegee, and University of Georgia Colleges of Veterinary Medicine. Experienced preprofessional advising is provided for all students pursuing advanced degrees.

ANIMAL AGRIBUSINESS CONCENTRATION

Freshman Year
First Semester
1 - AVS 100 Orientation to Animal and Vet. Sci.
3 - AVS 150 Introduction to Animal Science
1 - AVS 151 Introduction to Animal Science Lab.
5 - 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.) Requirement 1
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 101 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 Requirement 2
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 - ECON 212 Principles of Macroeconomics
3 - Elective
16
Second Semester
3 - AVS 375 Applied Animal Nutrition
3 - AVS 413 Animal Products
3 - AVS 453 Animal Reproduction
3 - LAW 322 Legal Environment of Business
3 - Elective
15
Senior Year
First Semester
3 - AVS 310 Animal Health
3 - AVS 415 Contemporary Issues in Animal Sci.
3 - MKT 301 Principles of Marketing
3 - AVS Experience-Based Activity 4
2 - AVS Techniques Requirement 2
14
Second Semester
2 - AVS 406 Seminars and Related Topics
3 - AVS 410 Domestic Animal Behavior
2 - AVS 417 Animal Agribusiness Development
4 - AVS 450 Sustainable Livestock Production Sys.
3 - AVS Experience-Based Activity 4
2 - Elective
16
123–126 Total Semester Hours

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

1 - AVS 200, 201, 203, 204, 206, 209 or 455
3 - AVS 302, 309, or 311
4 - AVS 360, 441, 442, 443, or 491

16-18

EQUINE BUSINESS CONCENTRATION

Freshman Year
First Semester
1 - AVS 100 Orientation to Animal and Vet. Sci.
3 - AVS 150 Introduction to Animal Science
1 - AVS 151 Introduction 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.) Requirement 1
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 101 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 Requirement 2
16-18
Sophomore Year
First Semester
3 - AVS 301 Anat. and Phys. of Domestic Animals
3 - AVS 370 Principles of Animal Nutrition
3 - AVS 470 Animal Genetics
3 - ECON 212 Principles of Macroeconomics
3 - Elective
15
Second Semester
2 - AVS 204 Horse Care Techniques
3 - ACCT 201 Financial Accounting Concepts
3 - EX ST 301 Introductory Statistics
3 - MKT 301 Principles of Marketing
3 - AVS Experience-Based Activity 4
2 - AVS Techniques Requirement 2
14
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 - ECON 212 Principles of Macroeconomics
3 - Elective
16
Second Semester
3 - AVS 375 Applied Animal Nutrition
3 - AVS 413 Animal Products
3 - AVS 453 Animal Reproduction
3 - LAW 322 Legal Environment of Business
3 - Elective
15
Senior Year
First Semester
3 - AVS 310 Animal Health
3 - AVS 415 Contemporary Issues in Animal Sci.
3 - MKT 301 Principles of Marketing
3 - AVS Experience-Based Activity 4
2 - AVS Techniques Requirement 2
14
Second Semester
2 - AVS 406 Seminars and Related Topics
3 - AVS 410 Domestic Animal Behavior
2 - AVS 417 Animal Agribusiness Development
4 - AVS 450 Sustainable Livestock Production Sys.
3 - AVS Experience-Based Activity 4
2 - Elective
16
123–126 Total Semester Hours

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

1 - AVS 200, 201, 203, 204, 206, 209 or 455
3 - AVS 302, 309, or 311
4 - AVS 360, 441, 442, 443, or 491

16-18
**Senior Year**

**First Semester**
- 3 - AVS 110 Animal Health
- 2 - AVS 406 Seminars and Related Topics
- 3 - AVS 415 Contemporary Issues in Animal Sci.
- 4 - AVS 416 Equine Exercise Physiology
- 2 - AVS Experience-Based Activity

**Second Semester**
- 3 - AVS 410 Domestic Animal Behavior
- 4 - AVS 412 Advanced Equine Management
- 2 - AVS 417 Animal Agribusiness Development
- 6 - Elective
- 15

121–124 Total Semester Hours

**Junior Year**

**First Semester**
- 4 - AVS 301 Anat. and Phys. of Domestic Animals
- 3 - AVS 310 Animal Health
- 3 - AVS 370 Principles of Animal Nutrition
- 3 - BIOCH 301 Molecular Biochemistry or
- 3 - BIOCH 305 Essential Elements of Bioch. or
- 3 - BIOCH 406 Physiological Chemistry
- 3 - Departmental Requirement

**Second Semester**
- 3 - AVS 375 Applied Animal Nutrition
- 3 - AVS 453 Animal Reproduction
- 1 - GEN 300 Fundamental Genetics
- 1 - GEN 301 Fundamental Genetics Lab.
- 4 - MICRO 305 General Microbiology

**Senior Year**

**First Semester**
- 2 - AVS 406 Seminars and Related Topics
- 3 - AVS 415 Contemporary Issues in Animal Sci.
- 2 - AVS Techniques Requirement
- 3 - Departmental Requirement
- 3 - Elective

**Second Semester**
- 3 - AVS 410 Domestic Animal Behavior
- 3 - AVS 413 Animal Products
- 3 - AVS Experience-Based Activity
- 3 - Departmental Requirement
- 3 - Social Science Requirement

121–125 Total Semester Hours

**Sophomore Year**

**First Semester**
- 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) Requirement
- 2 - AVS Techniques Requirement
- 3 - Social Science Requirement

**Second Semester**
- 3 - CH 224 Organic Chemistry
- 1 - CH 228 Organic Chemistry Lab.
- 3 - EX ST 301 Introductory Statistics or
- 3 - MTHSC 203 Elem. Statistical Inference
- 3 - PHYS 208 General Physics II
- 1 - PHYS 210 General Physics II Lab.
- 2 - AVS Evaluation Requirement or
- 3 - Oral Communication Requirement
- 2 - AVS Techniques Requirement

15-16

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

**PREVETERINARY AND SCIENCE CONCENTRATION**

**Freshman Year**

**First Semester**
- 1 - AVS 100 Orientation to Animal and Vet. Sci.
- 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.) Requirement

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 102 Intro. to Math. Analysis or
- 4 - MTHSC 106 Calculus of One Variable I
- 2 - AVS Techniques Requirement

16-18

**Second Semester**
- 3 - ACS 111 Analytical Chemistry
- 3 - BIOSC 203 Biochemistry I
- 3 - CH 209 Organic Chemistry Lab.
- 3 - ENGL 107 Composition II
- 3 - MTHSC 102 Intro. to Math. Analysis or
- 4 - MTHSC 106 Calculus of One Variable I
- 2 - AVS Techniques Requirement

16

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

**Second Semester**
- 3 - ACS 111 Analytical Chemistry
- 3 - BIOSC 203 Biochemistry I
- 3 - CH 209 Organic Chemistry Lab.
- 3 - ENGL 107 Composition II
- 3 - MTHSC 102 Intro. to Math. Analysis or
- 4 - MTHSC 106 Calculus of One Variable I
- 2 - AVS Techniques Requirement

16

**Sophomore Year**

**First Semester**
- 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) Requirement
- 2 - AVS Techniques Requirement
- 3 - Social Science Requirement

**Second Semester**
- 3 - CH 224 Organic Chemistry
- 1 - CH 228 Organic Chemistry Lab.
- 3 - EX ST 301 Introductory Statistics or
- 3 - MTHSC 203 Elem. Statistical Inference
- 3 - PHYS 208 General Physics II
- 1 - PHYS 210 General Physics II Lab.
- 2 - AVS Evaluation Requirement or
- 3 - Oral Communication Requirement
- 2 - AVS Techniques Requirement

15-16

**Junior Year**

**First Semester**
- 4 - AVS 301 Anat. and Phys. of Domestic Animals
- 3 - AVS 310 Animal Health
- 3 - AVS 370 Principles of Animal Nutrition
- 3 - BIOCH 301 Molecular Biochemistry or
- 3 - BIOCH 305 Essential Elements of Bioch. or
- 3 - BIOCH 406 Physiological Chemistry
- 3 - Departmental Requirement

**Second Semester**
- 3 - AVS 375 Applied Animal Nutrition
- 3 - AVS 453 Animal Reproduction
- 1 - GEN 300 Fundamental Genetics
- 1 - GEN 301 Fundamental Genetics Lab.
- 4 - MICRO 305 General Microbiology

14

**Senior Year**

**First Semester**
- 2 - AVS 406 Seminars and Related Topics
- 3 - AVS 415 Contemporary Issues in Animal Sci.
- 2 - AVS Techniques Requirement
- 3 - Departmental Requirement
- 3 - Elective

13

**Second Semester**
- 3 - AVS 410 Domestic Animal Behavior
- 3 - AVS 413 Animal Products
- 3 - AVS Experience-Based Activity
- 3 - Departmental Requirement
- 3 - Social Science Requirement

15

121–125 Total Semester Hours

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

*AVS 200, 201, 203, 206, 209 or 455
*AVS 360, 441, 442, 443, or 491

**APPLIED ECONOMICS AND STATISTICS**

**Bachelor of Science**

The Applied Economics and Statistics curriculum helps the student build a strong understanding of economic principles as applied in agribusiness, community and economic development, and other fields. Courses in applied statistics and quantitative methods help build decision-making and problem-solving skills and acquaint the student with tools for data analysis.

In the Agribusiness Emphasis Area, core courses focus on agribusiness management, leadership, marketing and sales, finance, accounting, and other business skill development. Employment opportunities for Agribusiness graduates are many and diverse. Private sector opportunities include agribusiness management, banking, finance, sales, marketing, and public relations. Public sector opportunities include positions in organizations that promote food, agriculture, and natural resource interests; government agencies; and educational institutions.

The Economic and Statistical Analysis Emphasis Area contains most of the same courses as the Agribusiness Emphasis Area with increased requirements in calculus, matrix algebra, and probability theory. This more rigorous mathematics preparation provides a stronger foundation for graduate study or career skill development in quantitative economics or probability and statistics.

In the Community and Economic Development Concentration, core courses focus on community development methods, regional economic development, leadership, experiential learning, communication skills, and behavioral science principles. Employment opportunities for Community and Economic Development graduates include positions in social science administration, management, and research. Other careers include community development and economic development specialist positions with local, county, and state governments. Additional opportunities exist in a variety of agencies, research and consulting firms, foundations and councils, financial institutions, public and private utilities, and organizations looking for entrepreneurial skills.

In all three plans of study, there is an increasing emphasis on globalization and information technology. Students are encouraged to participate on a creative inquiry student research team and to take advantage of an internship and/or study abroad opportunity. All three study options provide an excellent background for professional or graduate study in several disciplines.

For students interested in economics and natural resources, the Department of Applied Economics and Statistics also administers the Natural Resource and Economic Policy Concentration within the Environmental and Natural Resources degree program. See page 51 for program details.
AGRICULTURE EMPHASIS AREA

Freshman Year
First Semester
3 - AP EC 205 Agriculture and Society
2 - C U 101 University Success Skills
4 - MTHSC 102 Intro. to Mathematical Analysis
3 - Oral Communication Requirement
3 - Elective
15
Second Semester
3 - AP EC 202 Agricultural Economics
3 - ENGL 103 Accelerated Composition
3 - EX ST 222 Statistics in Everyday Life
3 - Arts and Humanities (Literature) Requirement
3 - Elective
15
Sophomore Year
First Semester
3 - ACCT 201 Financial Accounting Concepts
3 - EX ST 301 Introductory Statistics
3 - MGT 201 Principles of Management
3 - Arts and Humanities (Literature) Requirement
3 - Elective
15
Second Semester
3 - ACCT 202 Managerial Accounting Concepts
3 - AP EC 302 Economics of Farm Management
3 - AP EC 308 Quantitative Applied Economics
3 - ECON 212 Principles of Macroeconomics
3 - Social Science Requirement
15
Junior Year
First Semester
3 - AP EC 309 Econ. of Agricultural Marketing or
3 - MKT 301 Principles of Marketing
3 - AP EC 402 Production Economics
3 - ECON (MGT) 306 Managerial Economics or
3 - ECON 314 Intermediate Microeconomics
3 - ENGL 314 Technical Writing
3 - Agribusiness Requirement
15
Second Semester
3 - AP EC 319 Agribusiness Management
3 - AP EC 421 Globalization or
3 - ECON 310 International Economy
3 - C R D 335 Leadership in Organizations and Communities
3 - EX ST 462 Statistics Applied to Economics
3 - MTHSC 400 Theory of Probability
15
Senior Year
First Semester
3 - AP EC 319 Agribusiness Management
3 - AP EC 421 Globalization or
3 - ECON 310 International Economy
3 - C R D 335 Leadership in Organizations and Communities
3 - EX ST 462 Statistics Applied to Economics
3 - MTHSC 400 Theory of Probability
15
See advisor.

ECONOMICS AND STATISTICAL ANALYSIS EMPHASIS AREA

Freshman Year
First Semester
3 - AP EC 205 Agriculture and Society
2 - C U 101 University Success Skills
4 - MTHSC 106 Calculus of One Variable I
4 - Natural Science Requirement
3 - Oral Communication Requirement
16
Second Semester
3 - AP EC 202 Agricultural Economics
3 - ENGL 103 Accelerated Composition
3 - EX ST 222 Statistics in Everyday Life
3 - Arts and Humanities (Non-Lit.) Requirement
4 - MTHSC 108 Calculus of One Variable II
16
Sophomore Year
First Semester
3 - EX ST 301 Introductory Statistics
3 - MGT 201 Principles of Management
4 - MTHSC 206 Calculus of Several Variables
3 - Arts and Humanities (Literature) Requirement
3 - Elective
16
Second Semester
3 - ACCT 202 Managerial Accounting Concepts
3 - AP EC 302 Economics of Farm Management
3 - AP EC 308 Quantitative Applied Economics
3 - ECON 212 Principles of Macroeconomics
3 - Social Science Requirement
15
Junior Year
First Semester
3 - AP EC 309 Econ. of Agricultural Marketing or
3 - MKT 301 Principles of Marketing
3 - AP EC 402 Production Economics
3 - ECON (MGT) 306 Managerial Economics or
3 - ECON 314 Intermediate Microeconomics
3 - ENGL 314 Technical Writing
3 - Agribusiness Requirement
15
Second Semester
3 - AP EC 319 Agribusiness Management
3 - AP EC 421 Globalization or
3 - ECON 310 International Economy
3 - C R D 335 Leadership in Organizations and Communities
3 - EX ST 462 Statistics Applied to Economics
3 - MTHSC 300 Theory of Probability
15
Second Semester
3 - AP EC 319 Agribusiness Management
3 - AP EC 421 Globalization or
3 - ECON 310 International Economy
3 - C R D 335 Leadership in Organizations and Communities
3 - EX ST 462 Statistics Applied to Economics
3 - MTHSC 400 Theory of Probability
15
See advisor.

COMMUNITY AND ECONOMIC DEVELOPMENT CONCENTRATION

Freshman Year
First Semester
3 - CP SC 120 Intro. to Information Technology
3 - MTHSC 102 Intro. to Mathematical Analysis
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Science and Tech. in Society Requirement
3 - Social Science Requirement
15
Second Semester
3 - ACCT 201 Financial Accounting Concepts
3 - ENGL 103 Accelerated Composition
4 - Natural Science Requirement
5 - Elective
15
Junior Year
First Semester
3 - AP EC 309 Econ. of Agricultural Marketing or
3 - MKT 301 Principles of Marketing
3 - AP EC 402 Production Economics
3 - ECON (MGT) 306 Managerial Economics or
3 - ECON 314 Intermediate Microeconomics
3 - ENGL 314 Business Writing or
3 - ENGL 314 Technical Writing
3 - MTHSC 210 Applied Matrix Algebra
15
Second Semester
3 - AP EC 409 Commodity Futures Markets
3 - AP EC 460 Agricultural Finance
3 - ECON 302 Money and Banking or
3 - ECON 315 Intermediate Macroeconomics
12
120 Total Semester Hours
See General Education Requirements.
See advisor.

Second Semester
3 - AP EC 409 Commodity Futures Markets
3 - AP EC 460 Agricultural Finance
3 - ECON 302 Money and Banking or
3 - ECON 315 Intermediate Macroeconomics
12
See advisor.
Junior Year
First Semester
3 - C R D 335 Leadership in Organizations and Communities
3 - ECON (MGT) 306 Managerial Economics or 3 - ECON 314 Intermediate Microeconomics
3 - Behavioral Science Requirement
3 - Emphasis Area Requirement
3 - Marketing Requirement
15

Second Semester
3 - AP EC 352 Public Finance
3 - C R D 336 Community Development Methods
3 - Behavioral Science Requirement
3 - Emphasis Area Requirement
3 - Planning Requirement
15

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

Second Semester
3 - C R D (AP EC) 412 Regional Economic Development Theory and Policy
3 - Behavioral Science Requirement
3 - Comm. and Econ. Dev. Practice/Applications
6 - Emphasis Area Requirement
15

120 Total Semester Hours

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

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 - BIOC 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
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 - GEN 302 Molecular and General Genetics
2 - GEN 303 Molecular and Gen. Genetics Lab.
3 - PHYS 122 Physics with Calculus I
1 - PHYS 124 Physics Lab. I
3 - Advanced Mathematics Requirement
16 - 17
Second Semester
3 - BIOC 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
17

Junior Year
First Semester
3 - BIOC 431 Physical Approach to Biochem.
2 - BIOC 433 General Biochemistry Lab. I
3 - CH 330 Introduction to Physical Chemistry
3 - Science Requirement
5 - Elective
16
Second Semester
3 - BIOC 432 Biochemistry of Metabolism
2 - BIOC 434 General Biochemistry Lab. II
3 - BIOC 436 Molecular Biol.: Genes to Proteins
3 - PHIL 326 Science and Values
3 - Science Requirement
14

Senior Year
First Semester
3 - BIOC 461 Cell Biology
3 - GEN (BIOC) 440 Bioinformatics
3 - Social Science Requirement
4 - Elective
13
Second Semester
2 - BIOC 493 Senior Seminar
3 - Science Requirement
3 - Social Science Requirement
6 - Elective
14

120–121 Total Semester Hours

Notes:
3EX ST 301, MTHSC 206, 301, or 302
3See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement.
3CH 331 may be substituted.
3BIOCSC 222, 223, or any courses at 300 level or above in BIOC, BIO E, BIOC, CH, EX ST, GEN, MICRO, MTHSC, PHYS, PL PA, and PL PH. Other courses must be approved by advisor.
3A two-semester sequence of a foreign language is strongly recommended.

BIOLICAL SCIENCES
Bachelor of Science
Biochemistry 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 wellbeing 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
1 - BIOSC 101 Frontiers in Biology I
4 - CH 101 General Chemistry
3 - COMM 150 Intro. to Human Communication or
3 - COMM 250 Public Speaking
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 111 Calculus II for Biologists

Sophomore Year

First Semester
3 - CH 223 Organic Chemistry and
1 - CH 227 Organic Chemistry Lab. or
4 - CH 201 Survey of Organic Chemistry
4 - Animal or Plant Diversity Requirement
3 - Arts and Humanities (Literature) Requirement
3 - Biochemistry or Genetics Requirement

Second Semester
3 - CH 224 Organic Chemistry and
1 - CH 228 Organic Chemistry Laboratory or
4 - Major Requirement
4 - Animal or Plant Diversity Requirement
3 - Biochemistry or Genetics Requirement
5 - Major Requirement

Junior Year

First Semester
3 - BIOSC 335 Evolutionary Biology
3 - BIOSC 461 Cell Biology
2 - BIOSC 462 Cell Biology Lab.
3 - ENGL 315 Scientific Writing and Comm.
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

Second 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 (Non-Lit.) Requirement
5 - Major Requirement
3 - Social Science Requirement

Senior Year

First Semester
2 - BIOSC 493 Senior Seminar
13 - Major Requirement

Second Semester
12 - Major Requirement
3 - Social Science Requirement

124 Total Semester Hours

Senior Year

First Semester
3 - BIOSC 461 Cell Biology
2 - BIOSC 462 Cell Biology Lab.
2 - BIOSC 493 Senior Seminar
4 - Entomology Requirement
4 - Major Requirement

Second Semester
3 - Entomology Requirement
6 - Major Requirement
3 - Social Science Requirement

124 Total Semester Hours

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

Sophomore Year

First Semester
3 - CH 223 Organic Chemistry and
1 - CH 227 Organic Chemistry Lab. or
4 - CH 201 Survey of Organic Chemistry
4 - Animal or Plant Diversity Requirement
3 - Arts and Humanities (Literature) Requirement
3 - Biochemistry or Genetics Requirement

Second Semester
3 - CH 224 Organic Chemistry and
1 - CH 228 Organic Chemistry Laboratory or
4 - Major Requirement
4 - Animal or Plant Diversity Requirement
3 - Biochemistry or Genetics Requirement
5 - Major Requirement

Junior Year

First Semester
3 - BIOSC 335 Evolutionary Biology
3 - BIOSC 461 Cell Biology
2 - BIOSC 462 Cell Biology Lab.
3 - ENGL 315 Scientific Writing and Comm.
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

Second 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 (Non-Lit.) Requirement
3 - Entomology Requirement
3 - Entomology Requirement
3 - Major Requirement
3 - Social Science Requirement

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PREPHARMACY EMPHASIS AREA

Freshman Year

First Semester
3 - BIOL 103 General Biology I
1 - BIOL 105 General Biology Lab.
1 - BIOSC 101 Frontiers in Biology I
4 - CH 101 General Chemistry
3 - COMM 150 Intro. to Human Communication or
3 - COMM 250 Public Speaking
4 - MTHSC 106 Calculus of One Variable I

Second Semester
3 - BIOL 104 General Biology II
1 - BIOL 106 General Biology Lab. II
1 - BIOSC 102 Frontiers in Biology II
4 - CH 102 General Chemistry
3 - ENGL 103 Accelerated Composition
4 - MTHSC 111 Calculus II for Biologists

Sophomore Year

First Semester
3 - CH 223 Organic Chemistry
1 - CH 227 Organic Chemistry Lab. or
4 - Animal or Plant Diversity Requirement
3 - Arts and Humanities (Literature) Requirement
3 - Biochemistry or Genetics Requirement
3 - Social Science Requirement

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Second Semester
3 - CH 224 Organic Chemistry
1 - CH 228 Organic Chemistry Lab.
4 - MICRO 305 General Microbiology
4 - Animal or Plant Diversity Requirement
d - Biochemistry or Genetics Requirement
d 15

Junior Year
First Semester
4 - BIOSC 315 Functional Human Anatomy
3 - BIOSC 335 Evolutionary Biology
3 - ENGL 315 Scientific Writing and Comm.
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
________________________
14
Second 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 - PSYCH 201 Introduction to Psychology
4 - Animal Physiology Requirement
3 - Economics Requirement
d 5 - Major Requirement
d 17

Senior Year
First Semester
3 - BIOSC 461 Cell Biology
2 - BIOSC 462 Cell Biology Lab.
2 - BIOSC 493 Senior Seminar
8 - Major Requirement
d 15
Second Semester
3 - Arts and Humanities (Non-Lit.) Requirement
d 11 - Major Requirement
d 14
124 Total Semester Hours

1Pharmacy programs require BIOL 103/105 and 104/106 or
equivalents; however, BIOL 110 and 111 may substitute.
The additional 1–2 credit hours will be subtracted from Major
Requirement credits.
2At least one lecture and associated laboratory must be com-
pleted for both animal diversity (BIOSC 302/306 or BIOSC
303/307, or other approved coursework) and for plant diversity
(BIOSC 304/308, BIOSC 320, or BIOSC 406/407, or other
approved coursework).
3See General Education Requirements. Six of these credit hours
must also satisfy the Cross-Cultural Awareness and Science and
Technology in Society Requirements.
4At least one lecture course must be completed for biochemistry
(BIOCH 301 or 305, or other approved coursework) and for
genetics (GEN 300 or 302, or other approved coursework).
5BIOSC 316, 459/460, or 475/476
6ECON 200, 211, or 212
7See advisor. Select one lecture/lab combination in ecology
(BIOSC 441/445, 443/444, 446/447, 470/471). The remain-
ing courses may be selected from EX ST 301, MTHSC 301, or
other approved statistics courses, or any BIOCH, BIOSC, BOT,
GEN or MICRO courses at the 300 level or higher. Students
planning to apply to medical, dental or graduate school should
select a statistics course.

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

Sophomore Year
First Semester
3 - CH 223 Organic Chemistry and
1 - CH 227 Organic Chemistry Lab. or
4 - CH 201 Survey of Organic Chemistry
4 - Animal or Plant Diversity Requirement
3 - Biochemistry or Genetics Requirement
d - Partial Differential Equations Requirement
d 14
Second Semester
3 - CH 224 Organic Chemistry and
1 - CH 228 Organic Chemistry Laboratory or
4 - Major Requirement
d 3 - EX ST 301 Introductory Statistics I
4 - Animal or Plant Diversity Requirement
3 - Biochemistry or Genetics Requirement
d 3 - Major Requirement
d 17

Junior Year
First Semester
3 - BIOSC 335 Evolutionary Biology
3 - ENGL 315 Scientific Writing and Comm.
3 - EX ST 311 Introductory Statistics II
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
3 - Major Requirement
d 16
Second Semester
4 - BIOSC 428 Quantitative Biology
3 - BIOSC 461 Cell Biology
2 - BIOSC 462 Cell Biology Lab.
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 - Social Science Requirement
d 16

Senior Year
First Semester
2 - BIOSC 493 Senior Seminar
3 - GEN 440 Bioinformatics
3 - Arts and Humanities (Literature) Requirement
8 - Major Requirement
d 16
Second Semester
1 - BIOSC 491 Undergraduate Research
3 - Arts and Humanities (Non-Lit.) Requirement
5 - Major Requirement
d 3 - Social Science Requirement
d 12
125 Total Semester Hours

1At least one lecture and associated laboratory must be completed
for both animal diversity (BIOSC 302/306 or BIOSC 303/307,
or other approved coursework) and for plant diversity (BIOSC
304/308, BIOSC 305/309, BIOSC 320, or BIOSC 406/407,
or other approved coursework).
2At least one lecture course must be completed for both
biochemistry (BIOCH 301 or 305, or other approved course-
work) and for genetics (GEN 300 or 302, or other approved
coursework).
3See advisor.
4BIOSC 434 may be substituted for CH 228.
5See advisor. Select one lecture/lab combination from each of
the following fields:
Physiology—BIOSC 316, 403/407, 459/460, 475/476
The remaining courses may be selected from any BIOCH,
BIOSC, BOT, GEN, or MICRO courses at the 300 level or
higher.
6See General Education Requirements. Six of these credits must
also satisfy the Cross-Cultural Awareness and the Science and
Technology in Society Requirements.

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

Sophomore Year
First Semester
3 - BIOSC 210 Introduction to Toxicology
3 - CH 223 Organic Chemistry and
1 - CH 227 Organic Chemistry Lab. or
4 - CH 201 Survey of Organic Chemistry
4 - Animal or Plant Diversity Requirement
3 - Biochemistry or Genetics Requirement
d 14
Second Semester
3 - CH 224 Organic Chemistry and
1 - CH 228 Organic Chemistry Laboratory or
4 - Major Requirement
d 3 - CH 201 Survey of Organic Chemistry
4 - Animal or Plant Diversity Requirement
3 - Biochemistry or Genetics Requirement
d 5 - Major Requirement
d 16

Junior Year
First Semester
3 - BIOSC 335 Evolutionary Biology
3 - ENGL 315 Scientific Writing and Comm.
3 - ENTOX 430 Toxicology
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
3 - Social Science Requirement
d 16
Second 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
5 - Major Requirement
d 16

148
Senior Year
First Semester
3 - BIOSC 461 Cell Biology
2 - BIOSC 462 Cell Biology Lab.
2 - BIOSC 493 Senior Seminar
3 - CH 313 Quantitative Analysis
1 - CH 317 Quantitative Analysis Lab.
3 - Major Requirement
48
Second Semester
3 - CH 413 Chemistry of Aqueous Systems or
3 - ENTOX 421 Chemical Sources and Fate in Environmental Systems
3 - Arts and Humanities (Non-Lit.) Requirement
4 - Major Requirement
3 - Social Science Requirement
3 - Toxicology Requirement
16
124 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.

Double Major in Biological Sciences/Science Teaching—Biological Sciences
The Bachelor of Arts Degree in Biological Sciences and Science Teaching—Biological Sciences prepares students for teaching biology on the secondary school level and for graduate studies in any of the life science areas. See page 111 for the curriculum.

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 or
3 - COMM 250 Public Speaking
4 - MTHSC 106 Calculus of One Variable I
17
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
3 - Mathematical Sciences Requirement
16
16
Sophomore Year
First Semester
4 - CH 201 Survey of Organic Chemistry
4 - Animal or Plant Diversity Requirement
3 - Biochemistry or Genetics Requirement
4 - Foreign Language Requirement
15
Second Semester
4 - Animal or Plant Diversity Requirement
3 - Biochemistry or Genetics Requirement
4 - Foreign Language Requirement
4 - Major Requirement
15
Junior Year
First Semester
3 - BIOSC 335 Evolutionary Biology
3 - BIOSC 461 Cell Biology
2 - BIOSC 462 Cell Biology Laboratory
3 - ENGL 315 Scientific Writing and Comm.
3 - Foreign Language Requirement
3 - Minor Requirement
17
Second Semester
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Foreign Language Requirement
3 - Major Requirement
6 - Minor Requirement
15
Senior Year
First Semester
2 - BIOSC 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
15
Second Semester
3 - PHYS 208 General Physics II
1 - PHYS 210 General Physics II Lab.
3 - Arts and Humanities (Literature) Requirement
2 - Major Requirement
3 - Minor Requirement
3 - Social Science Requirement
15

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PREREHABILITATION SCIENCES
EMPHASIS AREA
Freshman Year
First Semester
3 - BIOL 103 General Biology I
1 - BIOL 105 General Biology Lab. I
1 - BIOSC 101 Frontiers in Biology I
4 - CH 101 General Chemistry
3 - COMM 150 Intro. to Human Communication or
3 - COMM 250 Public Speaking
4 - MTHSC 106 Calculus of One Variable I
16
Second Semester
3 - BIOL 103 General Biology II
1 - BIOL 106 General Biology Lab. II
1 - BIOSC 102 Frontiers in Biology II
4 - CH 102 General Chemistry
3 - ENGL 103 Accelerated Composition
3 - Statistics Requirement
15
Sophomore Year
First Semester
4 - CH 201 Survey of Organic Chemistry
4 - Animal or Plant Diversity Requirement
3 - Biochemistry or Genetics Requirement
4 - Foreign Language Requirement
15
Second Semester
3 - PSYCH 201 Introduction to Psychology
4 - Animal or Plant Diversity Requirement1
3 - Biochemistry or Genetics Requirement4
4 - Foreign Language Requirement7
3 - Social Science Requirement6

Junior Year
First Semester
4 - BIOSC 315 Functional Human Anatomy
3 - BIOSC 335 Evolutionary Biology
3 - BIOSC 461 Cell Biology
2 - BIOSC 462 Cell Biology Laboratory
3 - Foreign Language Requirement7
15

Second Semester
4 - BIOSC 316 Human Physiology
3 - Arts and Humanities (Non-Lit.) Requirement6
3 - Foreign Language Requirement7
6 - Minor Requirement7
16

Senior Year
First Semester
2 - BIOSC 493 Senior Seminar
3 - ENGL 315 Scientific Writing and Comm.
3 - PHYS 207 General Physics I
1 - PHYS 209 General Physics I Lab.
3 - Minor Requirement7
3 - Social Science Requirement6
15

Second Semester
3 - PHYS 208 General Physics II
1 - PHYS 210 General Physics II Lab.
3 - Arts and Humanities (Literature) Requirement6
3 - Major Requirement4
6 - Minor Requirement7
16

125 Total Semester Hours

1See advisor. Conservation Biology Concentration students or students planning to take organic chemistry must take CH 101 and CH 102 and must satisfy the General Education Science and Technology in Society Requirement through another course.
2See General Education Requirements.

BIOSYSTEMS ENGINEERING

Bachelor of Science
The Biosystems Engineering program is administered jointly with the College of Engineering and Science. See page 90 for the curriculum.

ENVIRONMENTAL AND NATUREAL 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 Resources Management Concentration emphasizes both resource management and negotiation skills. These two concentrations are administered by the Department of Forestry and Natural Resources. The Natural Resource and Economic Policy Concentration provides more in-depth study in economics and policy applications and is administered by the Department of Applied Economics and Statistics.

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
3 - BIOL 103 General Biology I
1 - BIOL 105 General Biology Lab. I
4 - CH 101 General Chemistry1 or
4 - CH 105 Chemistry in Context I1
1 - E N R 101 Intro. to Enw. and Natural Res. I
3 - MTHSC 102 Intro. to Mathematical Analysis
3 - Oral Communications Requirement2
15

Second Semester
3 - BIOL 104 General Biology II
1 - BIOL 106 General Biology Lab. II
4 - CH 102 General Chemistry1 or
4 - CH 106 Chemistry in Context II1
3 - ENGL 103 Accelerated Composition
3 - EX ST 301 Introductory Statistics
1 - F N R 102 FNR Freshman Portfolio
15

Sophomore Year
First Semester
3 - AP EC 257 Natural Resources, Environment, and Economics
4 - BIOSC 320 Field Botany and
1 - Elective or
2 - FOR 205 Dendrology and
3 - FOR 221 Forest Biology
3 - CH 223 Organic Chemistry
4 - F N R 204 Soil Information Systems or
4 - CSENV 202 Soils
15

Second Semester
3 - GEN 300 Fundamental Genetics
3 - W F B (BIOSC) 313 Conservation Biology
3 - Arts and Humanities (Literature) Requirement6
3 - Physical Environment Requirement7
3 - Taxonomy/Habitat Requirement7
15

Junior Year
First Semester
3 - BIOSC 335 Evolutionary Biology
3 - Arts and Humanities (Non-Lit.) Requirement7
3 - Ecology Requirement6
3 - Physiology Requirement6
3 - Taxonomy/Habitat Requirement7
15

Second Semester
3 - ENGL 314 Technical Writing
3 - E N R 302 Natural Resources Measurements
3 - Ecology Requirement6
3 - Physiology Requirement6
3 - Taxonomy/Habitat Requirement7
15

Senior Year
First Semester
3 - FOR (E N R) 434 GIS for Landscape Planning
3 - Conservation Policy/Law Requirement7
3 - Internship, Creative Inquiry or Directed Research Requirement6
3 - Social Science Requirement7
3 - Taxonomy/Habitat Requirement7
15

Second Semester
3 - E N R (BIOSC) 413 Restoration Ecology
3 - E N R 450 Conservation Issues
1 - FOR 498 Senior Portfolio or
1 - W F B 498 Senior Portfolio
6 - Taxonomy/Habitat Requirement7
2 - Elective
15

120 Total Semester Hours
Second Semester
3 - E N R 450 Conservation Issues
6 - Applied Economics Requirement
3 - Community Development Requirement
3 - Elective or
3 - Minor Requirement
15
120 Total Semester Hours

GEOL 101, 103, or 106
Select from any BIOSC, CSENV, E N R, EE&S, EN SP, ENTOX, FOR, GEOL or W F B courses numbered 300 or higher.

Second Semester
3 - C R D (AP EC) 357 Natural Res. Economics
3 - ECON 212 Principles of Macroeconomics
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Arts and Humanities (Literature) Requirement
3 - Elective
15

Junior Year
First Semester
3 - AP EC 257 Natural Resources, Environment, and Economics
3 - ECON 212 Principles of Macroeconomics
3 - Arts and Humanities (Literature) Requirement
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Elective
15

Second Semester
3 - AP EC 475 Wildlife Economics
3 - EN SP 401 Studies in Environmental Science
3 - ECON 319 Environmental Economics
3 - Applied Economics Requirement
3 - Natural Science Requirement
3 - Minor Requirement
15

Senior Year
First Semester
3 - AP EC 457 Nat. Res. Use, Technology and Policy
3 - ECON 319 Environmental Economics
3 - Applied Economics Requirement
3 - Applied Economics Requirement
3 - Internship, Creative Inquiry or Directed Research Requirement
15

Second Semester
3 - CR D (AP EC) 357 Natural Res. Economics
3 - GEOL 101 Physical Geology
3 - GEOL 103 Physical Geology Lab.
3 - W F B (BIOSC) 313 Conservation Biology
6 - Minor Requirement
16

Senior Year
First Semester
3 - FOR (E N R) 416 Forest Policy and Admin.
3 - FOR (E N R) 434 GIS for Landscape Planning
3 - Internship, Creative Inquiry or Directed Research Requirement
3 - Minor Requirement
3 - Elective
15

Second Semester
3 - E N R 450 Conservation Issues
3 - ENOL 314 Technical Writing
2 - FOR 406 Forested Watershed Management
1 - FOR 498 Senior Portfolio
1 - W F B 498 Senior Portfolio
3 - W F B 462 Wetland Wildlife Biology
3 - Minor Requirement
15
122 Total Semester Hours

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

A minor is required and must be selected from the following: Biochemistry; Biological Sciences; Chemistry; Crop and Soil Environmental Science; Environmental Science and Policy; Forest Resource Management; Geology; Horticulture; Legal Studies; Microbiology; Natural Resource Economics; Nonprofit Leadership; Park and Protected Area Management; Therapeutic Recreation; Travel and Tourism; Urban Forestry; Wildlife and Fisheries Biology.

Internship (F N R 490); Creative Inquiry (F N R 470); Directed Research (W F B 463); or Senior Honors Thesis (F N R H491).

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 Culinology), 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 initially accredited 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 all of these fields, and graduates are also well prepared to pursue graduate study in many areas.
The Department of Food, Nutrition and Packaging Sciences also offers an accelerated five-year combined bachelor’s/master’s program that allows students to count up to twelve hours of graduate credit toward both the BS degree in Food Science and the MS degree in Food, Nutrition and Culinary Sciences. Details are available from the Department of Food, Nutrition and Packaging Sciences or at www.clemson.edu/fnp.

### FOOD SCIENCE AND TECHNOLOGY CONCENTRATION

#### 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
- 1 - FD SC 102 Perspectives in Food and Nutrition Sciences
- 1 - FD SC 450 Creative Inquiry
- 3 - PSYCH 201 Introduction to Psychology

**Sophomore Year**

**First Semester**
- 4 - CH 201 Survey of Organic Chemistry or
- 3 - CH 223 Organic Chemistry and
- 1 - CH 227 Organic Chemistry Lab.
- 1 - FD SC 450 Creative Inquiry
- 3 - PHYS 102 Physics with Calculus I and
- 1 - PHYS 105 General Physics Lab. I or
- 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) Requirement

**Second Semester**
- 4 - 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.
- 1 - NUTR 216 Current Issues in Nutrition
- 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 I Lab.
- 3 - Arts and Humanities (Non-Lit.) Requirement

**Junior 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
- 1 - FD SC 102 Perspectives in Food and Nutrition Sciences
- 1 - FD SC 450 Creative Inquiry
- 3 - PSYCH 201 Introduction to Psychology

**Senior 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
- 1 - FD SC 102 Perspectives in Food and Nutrition Sciences
- 3 - PSYCH 201 Introduction to Psychology

**NUTRITION AND DIETETICS CONCENTRATION**

#### 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
- 1 - FD SC 102 Perspectives in Food and Nutrition Sciences
- 3 - PSYCH 201 Introduction to Psychology

**Sophomore 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
- 1 - FD SC 102 Perspectives in Food and Nutrition Sciences
- 3 - PSYCH 201 Introduction to Psychology

**Junior 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
- 1 - FD SC 102 Perspectives in Food and Nutrition Sciences
- 3 - PSYCH 201 Introduction to Psychology

**Senior 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
- 1 - FD SC 102 Perspectives in Food and Nutrition Sciences
- 3 - PSYCH 201 Introduction to Psychology

52
Second Semester
3 - FD SC 402 Food Chemistry II
3 - FD SC (PKGSC) 409 Total Quality Mgt. for the Food and Packaging Industries
1 - FD SC 450 Creative Inquiry
4 - NUTR 425 Medical Nutrition Therapy II
3 - NUTR 426 Community Nutrition

124–127 Total Semester Hours

FOREST RESOURCE MANAGEMENT

Bachelor of Science
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, usable 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 62). The curriculum also provides the necessary prerequisites for graduate study.

For students interested in conservation biology, water, and natural resources, the Department of Forestry and Natural Resources also administers the Conservation Biology Concentration and the Natural Resources Management Concentration within the Environmental and Natural Resources degree program. See pages 50-51 for program details.

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 - E N R 101 Intro. to Environ. and Natural Res. I
3 - MTHSC 102 Intro. to Mathematical Analysis
3 - Oral Communication Requirement

Second Semester
3 - BIOL 104 General Biology II
1 - BIOL 106 General Biology Lab. II
3 - ENGL 103 Accelerated Composition
3 - EX ST 301 Introductory Statistics
1 - F N R 102 FNR Freshman Portfolio
4 - Departmental Science Requirement

Sophomore Year
First Semester
4 - F N R 204 Soil Information Systems
2 - FOR 205 Dendrology
3 - FOR 221 Forest Biology
3 - Arts and Humanities (Literature) Requirement
3 - Economics Requirement

Second Semester
3 - ENGL 314 Technical Writing
3 - FOR 206 Forestry Ecology
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Social Science Requirement
3 - Minor Requirement

Forestry Summer Camp
2 - FOR 251 Forest Communities
1 - FOR 252 Forest Operations
4 - FOR 253 Forest Mensuration
1 - FOR 254 Forest Products

Junior Year
First Semester
2 - FOR 302 Forest Biometrics
3 - FOR 304 Forest Resource Economics
3 - FOR 341 Wood Procurement Practices in the Forest Industry
4 - FOR 413 Integrated Forest Pest Management
3 - FOR (E N R) 434 GIS for Landscape Planning
1 - Internship, Creative Inquiry or Directed Research Requirement

Second Semester
2 - FOR 308 Remote Sensing in Forestry
3 - FOR 408 Wood and Paper Products
3 - FOR 418 Forest Resource Valuation
4 - FOR 465 Silviculture
3 - Minor Requirement
1 - Internship, Creative Inquiry or Directed Research Requirement

Senior Year
First Semester
4 - FOR 410 Harvesting Processes
3 - FOR (E N R) 416 Forest Policy and Admin.
3 - FOR 417 Forest Resource Mgt. and Regulation
2 - FOR 431 Recreation Resource Planning in Forest Management
3 - Minor Requirement
1 - Internship, Creative Inquiry or Directed Research Requirement

Second Semester
4 - F N R 499 Natural Resources Seminar
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

LAND SURVEYING EMPHASIS AREA

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 - E N R 101 Intro. to Environ. and Natural Res. I
3 - MTHSC 102 Intro. to Mathematical Analysis
3 - Oral Communication Requirement

Second Semester
3 - BIOL 104 General Biology II
1 - BIOL 106 General Biology Lab. II
3 - ENGL 103 Accelerated Composition
3 - EX ST 301 Introductory Statistics
1 - F N R 102 FNR Freshman Portfolio
4 - Departmental Science Requirement

Sophomore Year
First Semester
4 - F N R 204 Soil Information Systems
2 - FOR 205 Dendrology
3 - FOR 221 Forest Biology
3 - Arts and Humanities (Literature) Requirement
3 - Economics Requirement

Second Semester
2 - FOR 254 Forest Products
3 - FOR 253 Forest Mensuration
1 - FOR 254 Forest Products

Junior Year
First Semester
2 - FOR 302 Forest Biometrics
3 - FOR 304 Forest Resource Economics
3 - FOR 341 Wood Procurement Practices in the Forest Industry
4 - FOR 413 Integrated Forest Pest Management
3 - FOR (E N R) 434 GIS for Landscape Planning
1 - Internship, Creative Inquiry or Directed Research Requirement

Second Semester
2 - FOR 308 Remote Sensing in Forestry
3 - FOR 408 Wood and Paper Products
3 - FOR 418 Forest Resource Valuation
4 - FOR 465 Silviculture
3 - Minor Requirement
1 - Internship, Creative Inquiry or Directed Research Requirement

Senior Year
First Semester
4 - FOR 410 Harvesting Processes
3 - FOR (E N R) 416 Forest Policy and Admin.
3 - FOR 417 Forest Resource Mgt. and Regulation
2 - FOR 431 Recreation Resource Planning in Forest Management
3 - Minor Requirement
1 - Internship, Creative Inquiry or Directed Research Requirement

Second Semester
2 - E G 210 Engineering Graphics for Civil Engr.
3 - ENGL 314 Technical Writing
3 - FOR 206 Forestry Ecology
3 - Arts and Humanities (Non-Lit.) Requirement
3 - Social Science Requirement

Forestry Summer Camp
2 - FOR 251 Forest Communities
1 - FOR 252 Forest Operations
4 - FOR 253 Forest Mensuration
1 - FOR 254 Forest Products
A degree in Genetics is a strong preparation for many careers. The degree provides an excellent foundation for medical, veterinary, or pharmacy school, as well as graduate research in any discipline related to biology, including bioinformatics, forensic technology, and genetic counseling. Because of the increasing emphasis on genetics in everyday life, a Bachelor of Science in Genetics can also be a direct path to a career in the emerging biotechnology industries (pharmaceuticals, agricultural technologies, biomimetic minerals) in research, sales, or business operations. Combined with a law degree, a genetics bachelor of science is a good background for a career as a patent attorney.

Senior Year
First Semester
2 - FOR 302 Forest Biometrics
3 - FOR 304 Forest Resource Economics
3 - FOR 341 Wood Procurement Practices in the Forest Industry
4 - FOR 413 Integrated Forest Pest Management
3 - FOR (E N R) 434 GIS for Landscape Planning
15
Second Semester
3 - AG M 221 Surveying: Earthwork and Area Measurements
2 - FOR 308 Remote Sensing in Forestry
3 - FOR 408 Wood and Paper Products
3 - FOR 418 Forest Resource Valuation
4 - FOR 465 Silviculture
15
Summer
3 - F N R 490 Field Training in Natural Resources

Senior Year
First Semester
4 - FOR 410 Harvesting Processes
3 - FOR (E N R) 416 Forest Policy and Admin.
3 - FOR 417 Forest Resource Mgmt. and Regulation
3 - FOR 433 GPS Applications
15
Second Semester
3 - B E 322 Small Watershed Hydrology and Sedimentology
1 - F N R 499 Natural Resources Seminar
2 - FOR 406 Forested Watershed Management
3 - FOR 415 Forest Wildlife Management
2 - FOR 425 Forest Resource Management Plans
1 - FOR 498 Senior Portfolio
3 - LAW 333 Real Estate Law
15
130 Total Semester Hours

GENETICS
Bachelor of Science
Genetics is the study of heredity. Genetics research takes many forms, from the study of heredity at the level of individual molecules to study at the level of cells and chromosomes, individuals, or populations. To comprehend current genetic information and to make future contributions to our molecular understanding of life processes, students must obtain a broad background in biology and a firm foundation in chemistry and mathematics. This is the basis of the genetics curriculum.
Freshman Year
First Semester
3 - BIOL 103 General Biology I
1 - BIOL 105 General Biology Lab. I
4 - CH 101 General Chemistry1 or
4 - CH 105 Chemistry in Context1
3 - HORT 101 Horticulture
4 - Spanish Language Requirement2

Second Semester
4 - CH 102 General Chemistry1 or
4 - CH 106 Chemistry in Context1
3 - ENGL 103 Accelerated Composition
1 - HORT 102 Experience Horticulture
3 - MTHSC 102 Intro. to Mathematical Analysis
4 - Related Science Requirement2

Sophomore Year
First Semester
3 - HORT 303 Landscape Plants
3 - MTHSC 101 Essential Math. for Informed Soc.
3 - Arts and Humanities (Non-Lit.) Requirement3
3 - Business Requirement2
4 - Plant Biology Requirement2

Second Semester
3 - HORT 305 Plant Propagation
1 - HORT 306 Plant Propagation Techniques Lab.
3 - Arts and Humanities (Literature) Requirement1
3 - Horticulture Specialization Requirement2
3 - Social Science Requirement

Summer
3 - HORT 271 Internship4 or
3 - HORT 471 Advanced Internship4

Junior Year
First Semester
4 - CSENV 202 Soils
3 - Horticulture Specialization Requirement2
3 - Oral Communication Requirement6
3 - Social Science Requirement
3 - Elective

Second Semester
3 - BIOSC 401 Plant Physiology
1 - BIOSC 402 Plant Physiology Lab.
1 - HORT 409 Seminar
3 - Business Requirement2
3 - Horticulture Specialization Requirement2
3 - Related Science Requirement2

Senior Year
First Semester
3 - Business Requirement2
6 - Horticulture Specialization Requirement2
6 - Related Science Requirement2

Second Semester
6 - Horticulture Specialization Requirement2
6 - Related Science Requirement2
1 - Elective
120 Total Semester Hours

Sophomore Year
First Semester
3 - CH 223 Organic Chemistry
1 - CH 227 Organic Chemistry Lab.
3 - Arts and Humanities (Literature) Requirement3
4 - General Microbiology Requirement6
3 - Social Science Requirement3
3 - Elective

Second Semester
2 - BIOSC 434 Biol. Chemistry Lab. Techniques
3 - CH 224 Organic Chemistry
1 - CH 228 Organic Chemistry Lab.
3 - Arts and Humanities (Non-Lit.) Requirement3
3 - Biochemistry Requirement6
3 - Microbiology Requirement6

Junior Year
First Semester
3 - BIOSC 461 Cell Biology
4 - MICRO 401 Microbial Diversity and Ecology
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
3 - Microbiology Requirement6

Second Semester
3 - ENGL 315 Scientific Writing and Comm.
4 - MICRO 412 Bacterial Physiology
3 - Microbiology Requirement1
3 - Virology Requirement6
4 - Elective5,6

Senior Year
First Semester
4 - MICRO 415 Microbial Genetics
4 - Microbiology Requirement6
3 - Social Science Requirement3
3 - Elective

Second Semester
2 - MICRO 493 Senior Seminar
4 - Microbiology Requirement6
9 - Elective
124–125 Total Semester Hours

1BIOL 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 200 level or higher. See advisor.
2MTHSC 111, 301, or EX ST 301, or other approved coursework. See advisor. Medical and dental schools have different mathematics requirements.
## BIOMEDICINE

### CONCENTRATION

#### Freshman Year

**First Semester**
- 5 - BIOL 110 Principles of Biology I
- 4 - CH 101 General Chemistry
- 3 - COMM 150 Intro. to Human Communication or COMM 250 Public Speaking
- 1 - MICRO 103 Microbes and Human Affairs
- 4 - MTHSC 106 Calculus of One Variable I

#### Second Semester

- 5 - BIOL 111 Principles of Biology II or CH 102 General Chemistry
- 3 - ENGL 103 Accelerated Composition
- 3 - Mathematics Requirement
- 15-16

#### Sophomore Year

**First Semester**
- 3 - CH 223 Organic Chemistry
- 1 - CH 227 Organic Chemistry Lab.
- 3 - Arts and Humanities (Literature) Requirement
- 4 - General Microbiology Requirement
- 4 - Elective

**Second Semester**
- 3 - CH 224 Organic Chemistry
- 1 - CH 228 Organic Chemistry Lab.
- 3 - Arts and Humanities (Non-Lit.) Requirement
- 3 - Biochemistry Requirement
- 3 - Biomedicine Requirement
- 3 - Social Science Requirement

#### Junior Year

**First Semester**
- 4 - MICRO 401 Microbial Diversity and Ecology
- 4 - MICRO (AVS, BIOSC) 414 Basic Immunology
- 3 - PHYS 207 General Physics I and
- 1 - PHYS 209 General Physics I Lab. or
- 3 - PHYS 212 Physics with Calculus I and
- 1 - PHYS 214 Physics Lab. I
- 3 - Genetics Requirement

**Second Semester**
- 3 - ENGL 315 Scientific Writing and Comm.
- 4 - MICRO 412 Bacterial Physiology
- 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
- 4 - Elective

### Senior Year

**First Semester**
- 3 - BIO 461 Cell Biology
- 2 - BIO 462 Cell Biology Lab.
- 4 - MICRO 415 Microbial Genetics
- 3 - MICRO 416 Introductory Virology
- 3 - Social Science Requirement

#### Second Semester

- 3 - MICRO 411 Pathogenic Bacteriology
- 3 - MICRO 417 Molecular Mechanisms of Carcinogenesis and Aging
- 1 - MICRO 421 Pathogenic Bacteriology Lab.
- 1 - MICRO 493 Senior Seminar
- 3 - Biomedicine Requirement
- 3 - Elective

**123–124 Total Semester Hours**

- 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 higher. See advisor.
- MTHSC 111, 301, or EX ST 301, or other approved coursework. See advisor. Medical and dental schools have different mathematics requirements.
- See General Education Requirements. Six of these credit hours must also satisfy the Cross-Cultural Awareness and Science and Technology in Society Requirements.
- MICRO 305 or other approved coursework.
- BIOL 301 or 305, or other approved coursework.
- BIO 423, 432, BIOSC 420, (PL PA) 425, 844, 457, 147, 467, 484, 489, HLTH 380, MICRO 400 or 491.
- GEN 300 or 302, or other approved coursework.

## 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, package design and graphics, materials, international packaging, marketing/finance, 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.

### Combined Bachelor of Science/Master of Science Degree Program

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

#### 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 - BIOL 104 General Biology II
- 1 - BIOL 106 General Biology Lab. II
- 4 - CH 102 General Chemistry
- 3 - ENGL 103 Accelerated Composition
- 2 - PKGSC 102 Intro. to Packaging Science
- 1 - PKGSC 103 Packaging Science ePortfolio

#### Sophomore Year

**First Semester**
- 3 - PKGSC 103 Packaging Science ePortfolio
- 3 - PKGSC 102 Intro. to Packaging Science
- 4 - MTHSC 106 Calculus of One Variable I
- 1 - PKGSC 101 Packaging Orientation
- 3 - Social Science Requirement

**Second Semester**
- 3 - BIOL 105 General Biology I
- 1 - BIOL 105 General Biology Lab. I
- 4 - CH 101 General Chemistry
- 4 - CH 102 General Chemistry
- 3 - ENGL 103 Accelerated Composition
- 4 - MTHSC 106 Calculus of One Variable I
- 1 - PKGSC 101 Packaging Orientation
- 3 - Social Science Requirement

**Sophomore Year**

**First Semester**
- 3 - PKGSC 103 Packaging Science ePortfolio
- 3 - PKGSC 102 Intro. to Packaging Science
- 4 - MTHSC 106 Calculus of One Variable I
- 1 - PKGSC 101 Packaging Orientation
- 3 - Social Science Requirement

**Second Semester**
- 3 - PKGSC 202 Packaging Materials and Manuf.
- 2 - PKGSC 203 Packaging Research Fundamentals

## Packaging Sciences

### 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, package design and graphics, materials, international packaging, marketing/finance, 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.

### Combined Bachelor of Science/Master of Science Degree Program

The Department of Food, Nutrition and Packaging Sciences also offers an accelerated five-year combined bachelor’s/master’s program that allows students to count up to twelve hours of graduate credit toward both the BS degree in Packaging Science and the MS degree in Packaging Science. Details are available from the Department of Food, Nutrition and Packaging Sciences or at www.clemson.edu/fnps.
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 students are 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 studies 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 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 Studies. 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
1 - 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.) Requirement
18

Second Semester
1 - 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 Introductory Composition
3 - EX ST 301 Introductory Statistics
1 - Elective
18

Second Year

First Semester
4 - BIOSC 222 Human Anatomy and Phys. I
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) Requirement
3 - History or Philosophy Requirement
18

Second Semester
4 - BIOSC 223 Human Anatomy and Phys. II
3 - CH 224 Organic Chemistry
1 - CH 228 Organic Chemistry Lab.
3 - COMM 150 Intro. to Human Comm.
3 - COMM 250 Public Speaking
3 - PHYS 208 General Physics II
1 - PHYS 210 General Physics II Lab.
3 - Science and Tech. in Society Requirement
18

Third Year

72–90 Total Semester Hours

A A H 210 or MUSIC 210
Select any ENGL course from General Education Arts and Humanities (Literature) Requirement.
See advisor.
See General Education Requirements.
Students planning to receive the Bachelor of Science degree upon completion of the program are required to complete a minimum of 18 additional credit hours which must include MICRO 305. See advisor for requirements.
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
1. BIOL 103 General Biology I
2. BIOL 105 General Biology Lab. I
3. CH 101 General Chemistry
4. PSYCH 201 Introduction to Psychology
5. Arts and Humanities (Non-Lit) Requirement

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

Second Year
First Semester
1. BIOSC 222 Human Anatomy and Phys. I
2. PHYS 207 General Physics I
3. PHYS 209 General Physics I Lab.
4. PSYCH 340 Lifespan Developmental Psych.
5. Arts and Humanities (Literature) Requirement
6. Arts and Humanities Requirement

Second Semester
1. BIOSC 223 Human Anatomy and Phys. II
2. COMM 150 Intro. to Human Comm. or COMM 250 Public Speaking
3. CP SC 120 Intro. to Information Technology
4. PHYS 208 General Physics II
5. PHYS 210 General Physics II Lab.

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 and Georgia College of Veterinary Medicine. Students planning to receive the Bachelor of Science degree upon completion of the program are required to complete an additional 24 credit hours. See advisor for requirements.

Third Year

90 Total Semester Hours

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 biosystem interactions and responds to the educational void between the rapid adoption 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 such as 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 agricultural; 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.

**Freshman Year**

**First Semester**
- 5 - BIOL 110 Principles of Biology I 1
- 4 - CH 101 General Chemistry
- 3 - MTHSC 102 Intro. to Math. Analysis 2 or
- 4 - MTHSC 106 Calculus of One Variable I 1
- 1 - SSCS 101 Survey of Soils and Sustainable Crop Systems
- 3 - Arts and Humanities (Non-Lit.) Requirement 1

**Second Semester**
- 5 - BIOL 111 Principles of Biology II 1
- 4 - CH 102 General Chemistry
- 3 - ENGL 103 Accelerated Composition
- 3 - EX ST 301 Introductory Statistics
- 4 - MTHSC 108 Calculus of One Variable II or
- 4 - MTHSC 207 Multivariable Calculus
- 1 - SSCS 102 Academic and Professional Dev. I

**16-17**

**Sophomore Year**

**CONCENTRATION**

**AGRICULTURAL BIOTECHNOLOGY CONCENTRATION**

**First Semester**
- 3 - CH 223 Organic Chemistry
- 1 - CH 227 Organic Chemistry Lab.
- 3 - COMM 250 Public Speaking
- 3 - ECON 200 Economic Concepts 1 or
- 3 - ECON 211 Principles of Microeconomics
- 3 - SSCS 333 Agricultural Genetics
- 3 - Arts and Humanities (Literature) Requirement

**Second Semester**
- 3 - AP EC 205 Agriculture and Society
- 3 - BIOSC 335 Evolutionary Biology
- 3 - CH 224 Organic Chemistry
- 1 - CH 228 Organic Chemistry Lab.
- 3 - GEN 300 Fundamental Genetics
- 1 - GEN 301 Fundamental Genetics Lab.

**14**

**Junior Year**

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

**Second Semester**
- 1 - CSENV (SSCS) 350 Practicum
- 3 - ENGL 315 Scientific Writing and Comm.
- 3 - PL PA 310 Plant Diseases and People
- 3 - PL PH (BIOCS) 340 Plant Med. and Magic
- 1 - SSCS 401 Academic and Professional Dev. II
- 4 - Emphasis Area Requirement

**Senior Year**

**First Semester**
- 1 - GEN 301 Fundamental Genetics Lab.
- 3 - GEN 300 Fundamental Genetics
- 3 - CH 224 Organic Chemistry
- 3 - AP EC 205 Agriculture and Society

**Second Semester**
- 3 - Arts and Humanities (Literature) Requirement
- 3 - SSCS 333 Agricultural Genetics
- 3 - COMM 250 Public Speaking
- 3 - CH 223 Organic Chemistry

**3 - Arts and Humanities (Non-Lit.) Requirement**

**Crop Systems**

- 3 - ECON 211 Principles of Microeconomics
- 3 - PHYS 221 Physics with Calculus II
- 1 - PHYS 210 General Physics II Lab.
- 3 - PHYS 223 Physics Lab. II
- 3 - Arts and Humanities (Literature) Requirement
- 3 - Cross-Cultural Awareness Requirement
- 4 - Emphasis Area Requirement

**SOIL AND WATER ENVIRONMENTAL SCIENCE CONCENTRATION**

**Sophomore Year**

**First Semester**
- 3 - CH 223 Organic Chemistry
- 1 - CH 227 Organic Chemistry Lab.
- 4 - CH 201 Survey of Organic Chemistry
- 4 - CSENV 202 Soils
- 3 - GEOL 101 Physical Geology
- 1 - GEOL 103 Physical Geology Lab.
- 3 - PHYS 207 General Physics I and
- 1 - PHYS 209 General Physics I Lab.
- 3 - PHYS 122 Physics with Calculus I and
- 1 - PHYS 124 Physics Lab. I

**Second Semester**
- 3 - PHYS 208 General Physics II and
- 1 - PHYS 210 General Physics II Lab.
- 3 - PHYS 221 Physics with Calculus II and
- 1 - PHYS 223 Physics Lab. II
- 3 - Arts and Humanities (Literature) Requirement
- 3 - Cross-Cultural Awareness Requirement
- 4 - Emphasis Area Requirement

**Junior Year**

**First Semester**
- 3 - COMM 250 Public Speaking
- 4 - MICRO 305 General Microbiology
- 5 - Emphasis Area Requirement
- 3 - Plant Science Requirement

**Second Semester**
- 3 - CSENV 475 Soil Physics and Chemistry
- 3 - CSENV 490 Beneficial Soil Organisms in Plant Growth
- 3 - ENGL 315 Scientific Writing and Comm.
- 1 - SSCS 401 Academic and Professional Dev. II
- 3 - Emphasis Area Requirement
- 3 - Social Science Requirement

**Senior Year**

**First Semester**
- 1 - CSENV (SSCS) 350 Practicum
- 2 - CSENV 403 Soil Genesis and Classification
- 1 - CSENV 455 Seminar
- 3 - Applied Spatial Technology Requirement
- 3 - Field Scale Environmental Mgt. Requirement

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

**15**

**124–126 Total Semester Hours**

**See General Education Requirements.**

**AGRICULTURAL BIOTECHNOLOGY CONCENTRATION**

**First Semester**
- 3 - GEN 402 Plant Physiology
- 1 - BIOSC 401 Plant Physiology
- 3 - CSENV (SSCS) 350 Practicum
- 4 - ENT (BIOCS) 301 Insect Biology and Diversity
- 1 - SSCS 445 Regulatory Issues and Policies
- 1 - SSCS 450 Agric. Biosystems and Risk Assess.
- 3 - Emphasis Area Requirement

**Second Semester**
- 2 - CSENV (SSCS) 350 Practicum
- 3 - CSENV 409 Biology of Invasive Plants
- 1 - SSCS 451 Agric. Biotech. and Global Society
- 2 - Emphasis Area Requirement

**Senior Year**

**First Semester**
- 1 - SSCS 401 Academic and Professional Dev. II
- 3 - GEN 403 Soil Genesis and Classification
- 1 - CSENV (SSCS) 350 Practicum
- 1 - PL PH (BIOSC) 340 Plant Med. and Magic
- 3 - ENGL 315 Scientific Writing and Comm.

**Second Semester**
- 3 - Emphasis Area Requirement
- 3 - Cross-Cultural Awareness Requirement
- 3 - Social Science Requirement

**16**

**124–126 Total Semester Hours**

**See General Education Requirements.**

**SUSTAINABLE CROP PRODUCTION CONCENTRATION**

**Sophomore Year**

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

**Second Semester**
- 3 - AP EC 205 Agriculture and Society
- 3 - CH 224 Organic Chemistry
- 1 - CH 228 Organic Chemistry Lab.
- 4 - CSENV 202 Soils
Students work closely with faculty in creative inquiry groups to investigate and implement solutions to real problems. Student interns experience a wide range of turf facilities, businesses, and public institutions to develop skills and experience needed for successful careers. In addition, the University’s golf course (Walker Golf Course) and athletic fields offer great employment and learning opportunities.

**Turfgrass**

**Bachelor of Science**

Turfgrass is a major part of our built environment and daily life, including home lawns, sports fields, and golf courses. Grasped areas are aesthetically attractive and provide many environmental benefits, including the prevention of soil erosion, noise reduction, improved water quality, and reduced injuries from sports.

Graduates pursue careers in management of professional golf courses and sports fields and in lawn care; production and sale of seed, sod, supplies, and equipment; or as technicians for businesses or government agencies. The curriculum provides a strong foundation in science, advanced business, and environmental and leadership skills that are needed for success in today’s competitive environment. Courses in horticulture also provide a background for turfgrass managers who may have responsibilities for landscaped areas.

**Sophomore Year**

**First Semester**

- HORT 211 Introduction to Turfgrass Culture
- HORT 212 Turfgrass Culture Lab.
- HORT 303 Landscape Plants
- MTHSC 101 Intro. to Mathematical Analysis
- 4 - Related Science Requirement

**Second Semester**

- CH 106 Chemistry in Context
- ENGL 101 Horticulture
- MTHSC 102 Intro. to Mathematical Analysis
- 3 - Related Science Requirement

**Junior Year**

**First Semester**

- HORT 302 Plant Physiology
- HORT 411 Advanced Turfgrass Management
- 4 - Plant Biology Requirement

**Second Semester**

- CH 102 General Chemistry
- CH 106 Chemistry in Context
- ENGL 101 Horticulture
- MTHSC 102 Intro. to Mathematical Analysis
- 3 - Related Science Requirement

**Senior Year**

**First Semester**

- CSENV 490 Beneficial Soil Organisms in Plant Growth
- 5 - Emphasis Area Requirement

**Second Semester**

- CSENV 490 Beneficial Soil Organisms in Plant Growth
- ENT 407 Applied Agricultural Entomology
- 6 - Emphasis Area Requirement

- Freshman Year**

**First Semester**

- BIOL 101 General Biology I
- BIOL 101 General Biology Lab. I
- CH 101 General Chemistry
- CH 101 General Chemistry Lab.
- CSENV 405 Plant Breeding
- CSENV 490 Beneficial Soil Organisms in Plant Growth
- 6 - Emphasis Area Requirement

**Second Semester**

- CH 201 and BIOCH 305/306 may be substituted.
- CH 201 and BIOCH 305/306 may be substituted.
- CSENV 422, 423, HORT 310, 455, 456, or other course approved by advisor
- Select from department-approved list. Emphasis Areas include Crop Production; and Integrated Pest Management.
- See General Education Requirements.

**Summer**

- PL PA (ENT) 408 Diseases and Insects of Turfgrasses Laboratory

**Senior Year**

**First Semester**

- HORT 412 Advanced Turfgrass Management
- Business Requirement
- Horticulture Specialization Requirement
- Related Science Requirement
- Soils Requirement

**Second Semester**

- HORT (CSENV) 433 Landscape and Turf Weed Management
- Horticulture Specialization Requirement
- Related Science Requirement
- Soils Requirement

- 120 Total Semester Hours

3Students not taking the CH 105/106 sequence must satisfy the General Education Science and Technology in Society Requirement by selecting a qualifying course from the Related Science Requirement.
4See advisor. Select from department-approved list.
5See General Education Requirements. Three of these credit hours must also satisfy the Cross-Cultural Awareness Requirement.
6Internship 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.
7Note: 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 has 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, recreation, 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.

For students interested in conservation biology, water, and natural resources, the Department of Forestry and Natural Resources also administers the Conservation Biology and Natural Resources Management Concentrations within the Environmental and Natural Resources degree program. See pages 50-51 for program details.
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 - E N R 101 Intro. to Env. and Natural Res. I
3 - MTHSC 102 Intro. to Mathematical Analysis
3 - Oral Communication Requirement
15

Second Semester
3 - BIOL 104 General Biology II
1 - BIOL 106 General Biology Lab. II
4 - CH 106 Chemistry in Context II or PHYS 200 Introductory Physics
3 - ENGL 103 Accelerated Composition
3 - EX ST 301 Introductory Statistics
1 - F N R 102 FNR Freshman Portfolio
15

Sophomore Year

First Semester
4 - F N R 204 Soil Information Systems
2 - FOR 205 Dendrology
3 - FOR 221 Forest Biology
3 - W F B 300 Wildlife Biology
1 - W F B 301 Wildlife Biology Lab.
3 - Arts and Humanities (Non-Lit.) Requirement
16

Second Semester
3 - FOR 206 Forestry Ecology
3 - W F B (BIOSC) 313 Conservation Biology
3 - W F B 350 Principles of Fish and Wildlife Biol.
3 - Arts and Humanities (Literature) Requirement
3 - Social Science Requirement
15

Junior Year

First Semester
3 - BIOSC 303 Vertebrate Biology
4 - BIOSC 320 Field Botany
3 - ENGL 314 Technical Writing
3 - GEN 300 Fundamental Genetics
3 - W F B 410 Wildlife Management Techniques
16

Second Semester
3 - W F B 412 Wildlife Management
3 - W F B 416 Fishery Biology
3 - W F B 440 Non-Game Wildlife Management
3 - W F B 462 Wetland Wildlife Biology
3 - Approved Requirement
15

Senior Year

First Semester
3 - AP EC 257 Natural Resources, Environment, and Economics
4 - AVS 301 Anat. and Phys. of Domestic Animals
3 - FOR (E N R) 434 GIS for Landscape Planning
1 - W F B 498 Senior Portfolio
4 - Approved Requirement
15

Second Semester
1 - F N R 499 Natural Resources Seminar
3 - W F B 430 Wildlife Conservation Policy
8 - Approved Requirement
3 - Policy and Law Requirement
15

122 Total Semester Hours

Students planning to take organic chemistry should substitute CH 101 and 102.

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 or applied economics.) Select from department-approved list.

122 Total Semester Hours
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
Architecture
Art
Athletic Leadership
Biochemistry
Biological Sciences
Business Administration
Chemistry
Cluster
Communication Studies
Computer Science
Crop and Soil Environmental Science
Digital Production Arts
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
History
Horticulture—not open to Turfgrass majors
International Engineering and Science
Legal Studies
Management
Management Information Systems
Mathematical Sciences
Microbiology
Military Leadership
Modern Languages
Music
Natural Resource Economics
Nonprofit Leadership
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
Theatre
Therapeutic Recreation
Travel and Tourism
Turfgrass—not open to Horticulture majors
Urban Forestry
Wildlife and Fisheries Biology
Women’s Studies
Writing
See pages 37–40 for details.