Many aspects of science, engineering, business, and economics are represented in the agricultural sciences. Comprising nearly 25 percent of the nation's workforce, these broad fields of study extend throughout society and provide opportunities in the development, manufacture, and sale of agricultural machinery, equipment, and chemicals; processing and marketing of agricultural products; biological research; animal health; environmental research and regulation; corporate farm management; ornamental horticulture and nursery management; and consulting work for foreign governments.

The curricula in the College of Agricultural Sciences are planned to provide the student: (1) knowledge pertaining to a specific agricultural science, (2) fundamental training in other basic sciences, and (3) a broad, general educational experience. The curricula provide a flexible program of study designed to keep the student up to date on the rapid changes and improvements that are taking place in agriculture. Frequent consultation with a faculty adviser helps the student make steady progress toward achieving these educational goals.

Major programs are offered in food and agribusiness management, agricultural economics, agricultural education, agricultural engineering technology, animal science, engineering technology, natural resource management, entomology, environmental soil science, food science, entomology/plant pathology, plant science, and general agriculture. Concentrations are available in wildlife conservation, general entomology, ornamental horticulture, agronomy, pathology, general plant science, pre-veterinary medicine, agricultural biotechnology, applied animal science, general animal science, production and management, resource economics and rural development, and food marketing.

An attractive feature of the engineering technology program, as well as of the general agriculture program, is that students may complete their degree requirements on the Newark campus or through the Parallel Program at Dover or Georgetown.

DEAN'S SCHOLAR PROGRAM
Each year, the College of Agricultural Sciences invites a number of highly motivated students who have clearly defined educational goals and good academic records to pursue the Dean's Scholar Program. Students in the program are freed of most college requirements and develop individual programs of study under the supervision of their faculty adviser. The individual program must be put in writing and approved by the appropriate department chair and the associate dean of the college. Additional information is available from the Office of Academic Programs in the College.

AGRICULTURAL EDUCATION
This program qualifies the individual for certification by the State Department of Public Instruction as a comprehensive agricultural education instructor. Some students find it desirable to major in a particular area of agricultural sciences and include agricultural education courses in their bachelor's program, while others elect to double major.

A degree in agricultural education qualifies the graduate to serve as a teacher of agricultural education in public or private secondary schools, as an instructor of adult classes in agriculture, or as an educational leader with state or federal agencies or private businesses. Other opportunities are to be found in educational administrative positions, production agriculture, the Agricultural Extension Service, the Soil Conservation Service, and various leadership positions in agricultural organizations and agencies. Those who continue agricultural education studies through graduate school may go into college and university teaching, research, and state, regional, or federal supervisory positions.

Curricula in agricultural education are arranged individually with the liaison professor in agricultural education. Selected information in the section of this catalog on the College of Education may be helpful to the agricultural education major.

DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE
MAJOR: AGRICULTURAL EDUCATION

CURRICULUM

UNIVERSITY REQUIREMENTS
ENGL 110 Critical Reading and Writing (with minimum grade of C) 3
Three credits in an approved course or courses stressing multicultural, ethnic, and/or gender-related content (see p. 20) 3
COLLEGE REQUIREMENTS

Mathematics and Computer Science
Mathematics course 3
Computer Science course selected from CISC 108, EGTE 111, FREC 135, or equivalent 3

Agricultural and Biological Sciences 9-12
Minimum of one course outside the student’s major in three of the following areas: Food and Resource Economics, Food Science, Agricultural Engineering, Animal Science, Entomology and Applied Ecology, Plant and Soil Sciences, or Biology

Literature and Arts
Nine credits from English and/or Communication

Social Sciences and Humanities
Minimum of one course in three of the following areas: Anthropology, Black American Studies, Criminal Justice, Economics, Education, Geography, History, Philosophy, Political Science, Psychology, Sociology, or Women’s Studies

Physical Sciences 8
Minimum of eight credits selected from one of the following two-course sequences:
CHEM 101/102 or 103/104
PHYS 201/202 or 207/208
GEOL 105 and 106
SCEN 101 and 102

MAJOR REQUIREMENTS

External to the College
EDST 201 Education in a Multicultural Society 3
EDST 230 Introduction to Exceptional Children 3
EDST 304 Educational Psychology - Social Aspects 3
EDST 305 Educational Psychology - Cognitive Aspects 3
EDDV 400 Student Teaching 6

The Agricultural Education program requires a certain minimum G.P.A. for enrollment in EDDV 400, Student Teaching, a course required for the degree. The teacher education program adviser (see list on p. 127) should be consulted for other policies concerning qualifications for student teaching.

Within the College
A 2.75 index in at least thirty credits of technical agriculture 30

Within the Department
Professional Education
AGED 380 Agricultural Education Materials and Approaches I 3
AGED 381 Agricultural Education Materials and Approaches II 3

Electives 32-35
Electives may include Military Science, Music, or Physical Education. (Only four credits of activity-type Physical Education and/or four credits of performing Music organization credit may be counted toward the degree.)

In order to graduate with a major in Agricultural Education, students must have a minimum of 40 credit hours of General Education

CREDITS TO TOTAL A MINIMUM OF ........................................................................ 130

AGRICULTURAL ENGINEERING

The Agricultural Engineering Department offers majors in Agricultural Engineering and Engineering Technology. Both majors are accredited by the Accreditation Board for Engineering and Technology (ABET).

Agricultural engineering technology is the application of engineering techniques in such areas as production mechanization, energy, soil and water conservation, plant and animal environments, agricultural waste management, processing and storage, and building construction. This requires a knowledge of physical and natural sciences and technical skills to support engineering activities.

The agricultural engineering technology curriculum is designed to prepare students for engineering-related employment in agricultural industries. A scientific or business background may be obtained according to the student’s interest through the selection of electives in the College of Agricultural Sciences and other colleges of the University. To graduate with a major in agricultural engineering technology, students must attain a 2.0 average in agricultural engineering technology courses. This is in addition to the University requirement for graduation that a 2.0 average be attained in all course work at the University.

The computer is a heavily used tool throughout the agricultural engineering technology curriculum. Students are urged to purchase a personal computer. Please contact the department chair for further information on computer specifications or the academic program.

DEGREE: BACHELOR OF APPLIED SCIENCE

MAJOR: AGRICULTURAL ENGINEERING TECHNOLOGY

CURRICULUM

UNIVERSITY REQUIREMENTS
ENGL 110 Critical Reading and Writing (with minimum grade C) 3
Three credits in an approved course or courses stressing multicultural, ethnic, and/or gender-related content (see p. 20) 3

COLLEGE REQUIREMENTS

Communications
Six credits selected to provide training in oral and written communications to include:
EGTE 365 Junior Seminar 6

A second writing course selected from the following:
ENGL 301 Expository Writing 3
ENGL 302 Advanced Composition 3
ENGL 307 News Writing and Editing 3
ENGL 312 Written Communications in Business 3
ENGL 410 Technical Writing 3
An oral communications course selected from the following:
COMM 200 Introduction to Human Communication Systems 3
COMM 253 Fundamentals of Communication 3
COMM 312 Oral Communication in Business 3
COMM 350 Public Speaking 3
COMM 356 Small Group Communication 3

Social Sciences and Humanities
Fifteen credits selected to provide an appreciation and understanding of our cultural heritage, interpersonal relationships, interrelationships between technology and society and a value system for sound decision making.
Nine credits to be selected from a minimum of three of the following areas: Anthropology, Art, Art History, Black American Studies, Criminal Justice, Economics, Education, English, Foreign Language, Geography, History, Music, Philosophy, Political Science, Psychology, Sociology, Theatre, or Women’s Studies

Basic Sciences and Mathematics 31

Thirty-one credits selected to provide fundamental knowledge about nature and its phenomena and mathematics including calculus as follows:

Biology, Chemistry and Physics
Biology/Life Science course 4
CHEM 103 General Chemistry 4
CHEM 104 General Chemistry 4
PHYS 201 Introductory Physics I 4
or
PHYS 207 Fundamentals of Physics I 4
PHYS 202 Introductory Physics II 4
or
PHYS 208 Fundamentals of Physics II 4

Mathematics and Statistics
A minimum of 12 credits in mathematics and statistics. Specific requirements are:
MATH 221 Calculus I 3
or
MATH 241 Analytic Geometry and Calculus A 4
MATH 222 Calculus II 3
or
MATH 242 Analytic Geometry and Calculus B 4
STAT 201 Introduction to Statistics I 3
or
MATH 243 Analytic Geometry and Calculus C 4

Elective Mathematics or Statistics Course at the 200 level or above 3
MAJOR REQUIREMENTS

Technical Sciences .................................................. 18

Eighteen credits that deal with the application of engineering science subject matter to include one course in each of the following areas: Electricity, Fluid Mechanics, Statics, and Thermodynamics.

Specific requirements are:

EGTE 218 Fundamentals of Hydraulic Systems ........................................ 4
EGTE 244 Electricity for Engineering Technology ..................................... 4
EGTE 311 Fundamentals of Thermodynamics .......................................... 3
EGTE 354 Rural/Light Industrial Buildings .............................................. 4

In addition, a course must be selected from one of the following areas:

Dynamics, Electronics, Materials Technology, or Strength of Materials.

The course may be selected from the following:

EGTE 344 Electronics and Microprocessors ........................................... 3
EGTE 435 Machinery Design and Development ....................................... 3

Technical Skills ......................................................... 13

Thirteen credits selected to provide skills and knowledge of appropriate methods, procedures and techniques and may include computer use, graphics, problem solving, processes, construction techniques, instrumentation techniques, production methods, field operations, plant operations, safety and maintenance, to include:

Required:

EGTE 109 Technical Drafting .................................................................... 2
EGTE 111 Computer Applications in Engineering Technology .................. 3
EGTE 119 Land Surveying ........................................................................ 3
EGTE 209 Computer Aided Drafting ....................................................... 3

Elective:

EGTE 344 Electronics and Microprocessors ........................................... 3
or

EGTE 444 Instrumentation ....................................................................... 3
or

EGTE 444 Programmable Logic Control Systems .................................... 3

EGTE 444 may be used to fulfill either a Technical Skills Elective or a Technical Specialization Elective, but not both.

Technical Specialization ................................................................. 22

Twenty-two credits selected from courses that involve technical design and electives. At least one course that emphasizes use of the computer as a problem-solving tool will be required.

Specific requirements are:

EGTE 331 Mechanical Power Units ....................................................... 4
EGTE 431 Machine Systems for Agriculture ............................................ 4
EGTE 321 Storm Water Management ...................................................... 3
EGTE 445 Food Engineering Technology ................................................ 4

and two of the following:

EGTE 328 Agricultural Waste Management Systems ................................ 3
EGTE 421 Soil and Water Management Systems ..................................... 4
EGTE 440 Plant Layout and Materials Handling ...................................... 3
EGTE 443 Instrumentation .................................................................... 3
EGTE 444 Programmable Logic Control Systems .................................. 3
EGTE 456 Fundamentals of HVAC ......................................................... 3
AGEC 628 Land Application of Wastes .................................................. 3

Technical Support ............................................................................. 19

Nineteen credits selected to support the specialization and career interests of the student.

Specific requirement:

PCSC 204 Introduction to Soil Science .................................................... 4

Select one additional course in the college outside the department

The remaining fifteen credits may be satisfied in part or in total by additional course work in the Agricultural Engineering department or closely related subject matter, a double major within the College of Agricultural Sciences or relevant University-approved minor.

To graduate with a major in Agricultural Engineering Technology, students must attain a 2.0 index in Agricultural Engineering Technology courses.

ELECTIVES

Electives .................................................................................. 1-2

After required courses, sufficient elective credits must be taken to meet the minimum number of 130 credits. May include Military Science, Music, or Physical Education. (Only four credits of activity-type Physical Education and/or four credits of performing Music organization credit may be counted toward the degree.)

CREDITS TO TOTAL A MINIMUM OF ................................................. 130

ENGINEERING TECHNOLOGY

Engineering technology is part of the broad discipline of engineering, in which a knowledge of the mathematical and natural sciences is applied to utilize materials and forces for better living. Engineering technology requires the application of scientific and engineering knowledge combined with technical skills in support of engineering activities. The engineering technology curriculum prepares the engineering technologist to make independent judgments and to design and manage systems and components to achieve conceptual goals with consideration of their effectiveness, safety or cost. Close liaison is maintained between the educational programs and employers to give graduates the greatest opportunity for career development and to meet the needs of the industry.

Two concentrations are available within the major: technical applications and technical management. The technical applications concentration includes coursework in mechanization, energy management, hydraulics and hydrology, building environments, waste management, processing and construction. Students are prepared for engineering-related employment with a variety of companies, including industries, consulting firms, and construction companies, as well as with government agencies. The technical management concentration provides basic management concepts utilized in engineering and production-related activities. This concentration is often useful to the part-time student who already has an associate degree in engineering technology and desires to prepare for management opportunities, and for other individuals who need additional technical training.

Students who choose the engineering technology major may take all of the necessary courses at the University of Delaware (enter as freshman) or they may transfer previously completed appropriate course work at another accredited institution. Students wishing to have prior course work considered must contact an advisor in the department for a degree analysis.

Computer use for problem solving is important throughout the engineering technology curriculum. Students are urged to have their own computer with spreadsheet and word processing software, and should be able to connect to the University computer network.

DEGREE: BACHELOR OF APPLIED SCIENCE

MAJOR: ENGINEERING TECHNOLOGY

CORE CURRICULUM

UNIVERSITY REQUIREMENTS

ENGL 110 Critical Reading and Writing (with minimum grade of C-) ......... 3
Three credits in an approved course or courses stressing multicultural, ethnic, and/or gender-related content (see p. 20) ................................................................................................................................. 3

COLLEGE REQUIREMENTS

Communications .............................................................................. 6
Six credits selected to provide training in oral and written communications to include:

A second writing course selected from the following:

ENGL 301 Problems in Composition .................................................. 3
ENGL 302 Advanced Composition ....................................................... 3
ENGL 307 News Writing and Editing .................................................... 3
ENGL 312 Written Communications in Business .................................. 3
ENGL 410 Technical Writing ................................................................. 3
An oral communications course selected from the following:

COMM 200 Introduction to Human Communication Systems .......... 3
COMM 255 Fundamentals of Communication ..................................... 3
COMM 312 Oral Communication in Business ...................................... 3
COMM 350 Public Speaking ................................................................. 3
COMM 356 Small Group Communication .......................................... 3

Social Sciences and Humanities ....................................................... 15
Fifteen credits selected to provide an appreciation and understanding of our cultural heritage, interpersonal relationships, interrelationships between technology and society and a value system for sound decision making to include:

 multicultural, ethnic, and/or gender-related content (see p. 20)
ECON 151 Introduction to Microeconomics 3
ECON 152 Introduction to Macroeconomics 3
An additional nine credits to be selected from a minimum of three of the following areas: Anthropology, Art, Art History, Black American Studies, Criminal Justice, Economics, Education, English, Foreign Language, Geography, History, Music, Philosophy, Political Science, Psychology, Sociology, Theatre or Women's Studies

Basic Sciences and Mathematics 31
Thirty-one credits selected to provide fundamental knowledge about nature and its phenomena and mathematics including calculus as follows:

Biology, Chemistry and Physics
Biology/Life Science course 3
CHEM 103 General Chemistry 4
CHEM 104 General Chemistry 4
PHYS 201 Introductory Physics 4
or
PHYS 207 Fundamentals of Physics I 4
PHYS 202 Introductory Physics II 4
or
PHYS 208 Fundamentals of Physics II 4

Mathematics and Statistics
A minimum of 12 credits in mathematics and statistics. Specific requirements are:
MATH 221 Calculus I 3
or
MATH 241 Analytic Geometry and Calculus A 4
MATH 222 Calculus II 3
or
MATH 242 Analytic Geometry and Calculus B 4
STAT 201 Introduction to Statistics I 3
or
MATH 243 Analytic Geometry and Calculus C 4

Elective Mathematics or Statistics course at the 200-level or above 3

MAJOR REQUIREMENTS
To graduate with a major in engineering technology, a student must attain at least a 2.0 average in EGTE courses and must earn at least a C- in all prerequisite courses to qualify for admission to the next course. This requirement is in addition to the University requirement of a 2.0 grade-point average. A student must complete a minimum of 48 semester hours in course work assigned to technical science, technical skills and technical specialization categories.

Technical Sciences 18
Eighteen credits that deal with the application of engineering science subjects. Specific requirements are:
EGTE 218 Fundamentals of Hydraulic Systems 4
EGTE 244 Electricity for Engineering Technology 4
EGTE 311 Fundamentals for Thermodynamics 3
EGTE 456 Rural/Light Industrial Buildings 4
In addition, a course must be selected from one of the following areas: Dynamics, Electronics, Material Technology or Strength of Materials

In addition to completing the requirements of the core curriculum in Engineering Technology, students must complete the requirements for a concentration in Technical Applications or a concentration in Technical Management.

CONCENTRATION: TECHNICAL APPLICATIONS
Students must complete all the requirements for the core curriculum in Engineering Technology, in addition to the concentration requirements below.

Technical Skills 12-30
A minimum of fourteen credits selected to provide skills and knowledge of appropriate methods, procedures and techniques and may include computer use, graphics, problem solving, processes, construction techniques, instrumentation techniques, production methods, field operations, plant operations, safety and maintenance to include:
EGTE 109 Technical Drafting 2
EGTE 111 Computer Application in Engineering Technology 3
EGTE 209 Computer Aided Drafting 3
Microcomputer course (EGTE 112 Personal Computers and Technology preferred). 3
Instrumentation or microprocessor course 3

A maximum of thirty semester credits will be permitted in this category. The selection of courses in the technical skills category must be consistent with the specialization. A minimum of six hours of drafting and one course in computer-aided drafting can be applied towards degree requirements. Also a maximum of six hours of surveying and topographic mapping and a maximum of six hours of instrumentation can be applied towards degree requirements. For transfer students, after matriculation in the program, course work will normally be limited to instrumentation and computer use.

Technical Specialization 9-16
A minimum of nine credits selected from courses that involve technical design and electives. At least one course (this requirement cannot be satisfied by transfer credit) that emphasizes use of the computer as a problem solving tool will be required and will be selected from:
EGTE 321 Storm Water Management 4
EGTE 323 Mechanical Power Unit 4
EGTE 435 Machinery Design and Development 3
EGTE 456 Fundamentals of HVAC 3

Technical Management 15
A minimum of fifteen credits selected to enhance the ability to understand the operation and management of companies and/or their production units to include:
ANIMAL AND FOOD SCIENCES

The Department of Animal and Food Sciences offers undergraduate major and minor programs in Animal Science and in Food Science.

The Animal Science major encompasses a wide range of disciplines in which the principles of biology, chemistry and biochemistry are applied to animal agriculture. Instruction is offered in animal nutrition, physiology, genetics, and reproduction; in animal health and molecular biology; and in dairy, livestock and poultry management. The department offers four areas of concentration within the major: preveterinary medicine, agricultural biotechnology, applied animal science, and general animal science. Animal health, management, nutrition, molecular biology and physiology constitute areas in which the animal science student may wish to specialize. Students interested in pursuing graduate studies in the animal sciences are well prepared by available course work and laboratory experiences. Students interested in veterinary medicine have the opportunity to obtain preveterinary training required for admission to veterinary school. Students are encouraged to participate in a broad realm of animal science research projects in the department through independent study/special problems courses.

The Food Science major is designed to provide students with a broad understanding and professional preparation in areas of food production, processing, evaluation, and distribution. These include positions within the food and allied industries, the government, and independent research institutions. The role of the food scientist in such positions may involve production and process development, engineering, quality control, technical service and sales, and regulatory service, education, or basic research. The food science research program has opportunities for students in three areas: (1) packaging, product interaction, and food chemistry; (2) biotechnology, fermentation, and food microbiology; and (3) process engineering technology. Educational and research opportunities in biotechnology are fostered by the department's Biotechnology Group. The program includes course work in life and chemical sciences, mathematics and engineering, plus independent research work on applied science problems. Students may join as members of the Institute of Food Technologists.

Department faculty foster student involvement in the University Honors Programs through sponsorship of Science and Engineering Scholars and candidates for the Degree with Distinction. The teaching philosophy of the department faculty is to emphasize basic knowledge pertaining to animal and food sciences.

A curriculum for each major/concentration follows; the minors in Animal Science and in Food Science are also described. The preveterinary concentration is designed to meet not only the department, college, and University requirements for the B.S. degree, but also the admission requirements of most veterinary schools to which students apply.

ANIMAL AND FOOD SCIENCES

<table>
<thead>
<tr>
<th>DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAJOR: ANIMAL SCIENCE</td>
</tr>
<tr>
<td>CONCENTRATION: GENERAL ANIMAL SCIENCE</td>
</tr>
</tbody>
</table>

**CURRICULUM**

<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Courses</th>
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<tbody>
<tr>
<td>130</td>
<td></td>
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**UNIVERSITY REQUIREMENTS**

<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Course</th>
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<tbody>
<tr>
<td>3</td>
<td>ENGL 110 Critical Reading and Writing (with minimum grade of C)</td>
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<tr>
<td>3</td>
<td>Three credits in an approved course or courses stressing multicultural,</td>
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<td></td>
<td>ethnic, and/or gender-related content (see p. 20)</td>
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<tr>
<td>9 or 12</td>
<td>College requirement for degree.</td>
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**MAJOR REQUIREMENTS**

<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>4</td>
<td>BISC 208 Introduction Biology I</td>
</tr>
<tr>
<td>4</td>
<td>CHEM 103 General Chemistry</td>
</tr>
<tr>
<td>4</td>
<td>CHEM 104 General Chemistry</td>
</tr>
<tr>
<td>4</td>
<td>CHEM 105 General Chemistry</td>
</tr>
<tr>
<td>1</td>
<td>ANSC 401 Dairy Production</td>
</tr>
<tr>
<td>3</td>
<td>ANSC 417 Beef Cattle and Sheep Production</td>
</tr>
<tr>
<td>4</td>
<td>ANSC 418 Swine Production</td>
</tr>
<tr>
<td>4</td>
<td>ANSC 421 Poultry Production</td>
</tr>
<tr>
<td>5</td>
<td>Animal Science courses</td>
</tr>
<tr>
<td>6</td>
<td>No more than five credits of ANSC 266, 356, 466 or 666 Special</td>
</tr>
<tr>
<td></td>
<td>Problem/Independent Study may be used for the major</td>
</tr>
</tbody>
</table>

**ELECTIVES**

<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Electives</th>
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<tbody>
<tr>
<td>58-61</td>
<td></td>
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</tbody>
</table>

**Recommended Electives**

<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Course</th>
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<tbody>
<tr>
<td>3</td>
<td>ANSC 270 Biotechnology: Science and Socioeconomic Issues</td>
</tr>
<tr>
<td>3</td>
<td>ANSC 420 Equine Management</td>
</tr>
<tr>
<td>3</td>
<td>BISC 371 Introduction to Microbiology</td>
</tr>
<tr>
<td>3</td>
<td>COMM 350 Public Speaking</td>
</tr>
<tr>
<td>3</td>
<td>ENGL 312 Written Communications in Business</td>
</tr>
</tbody>
</table>

**CREDITS TO TOTAL A MINIMUM OF** 130

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ANIMAL AND FOOD SCIENCES

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A curriculum for each major/concentration follows; the minors in Animal Science and in Food Science are also described. The preveterinary concentration is designed to meet not only the department, college, and University requirements for the B.S. degree, but also the admission requirements of most veterinary schools to which students apply.
DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE
MAJOR: ANIMAL SCIENCE
CONCENTRATION: PREVETERINARY MEDICINE

All requirements for the General Animal Science program must be met. The following courses are also required for the concentration:

Within the Concentration

- ANSC 310 Animal Genetics Laboratory 1
- BISC 371 Introduction to Microbiology 4
- CHEM 321 Organic Chemistry 4
- CHEM 322 Organic Chemistry 4
- CHEM 527 Introductory Biochemistry 3
- or
- CHEM 641/642 Biochemistry 6
- MATH 221 Calculus 3
- PHYS 201 Introductory Physics I 4
- PHYS 202 Introductory Physics II 4

ELECTIVES

- Electives 30-33
  May include Military Science, Music, or Physical Education. (Only four credits of activity-type Physical Education and/or four credits of performing Music organization credit may be counted toward the degree.)

  Recommended Electives

- FREC 201 Records and Accounts 3
- ANSC 270 Biotechnology: Science and Socioeconomic Issues 3
- ANSC 431 Infection and Immunity in Animal Diseases 4
- ANSC 446 Environmental Physiology of Domestic Animals 4
- ANSC 452 Advanced Comparative Animal Nutrition 4
- ANSC 635 Introduction to Virology 3
- COMM 312 Oral Communication in Business 3
- ENGL 312 Written Communications in Business 3
- FREC 405 Research Methods 3

CREDITS TO TOTAL A MINIMUM OF 130

DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE
MAJOR: ANIMAL SCIENCE
CONCENTRATION: AGRICULTURAL BIOTECHNOLOGY

All requirements for the General Animal Science program must be met. The following courses are also required for the concentration:

Within the Concentration

- ANSC 310 Animal Genetics Laboratory 1
- ANSC 319 Biotechnology: Science and Socioeconomic Issues 3
- ANSC 431 Infection and Immunity in Animal Diseases 4
- ANSC 446 Environmental Physiology of Domestic Animals 4
- ANSC 432 Advanced Comparative Animal Nutrition 4
- ANSC 635 Introduction to Virology 3
- or
- CHEM 214/216 Elementary Biochemistry 4
- or
- CHEM 641/642 Biochemistry 6
- MATH 221 Calculus I 3
- PHYS 201 Introductory Physics I 4
- PHYS 202 Introductory Physics II 4
- Select one 600-level course from ANSC or Biology (see recommended electives) 3-4

ELECTIVES

- Electives 27
  May include Military Science, Music, or Physical Education. (Only four credits of activity-type Physical Education and/or four credits of performing Music organization credit may be counted toward the degree.)

  Recommended Electives

- ANSC 431 Infection and Immunity in Animal Diseases 4
- ANSC 624 Monogastric Nutrition 3
- ANSC 633 Poultry Pathology 3
- ANSC 652 Molecular Endocrinology 4
- ANSC 654 Avian Physiology 4
- ANSC 655 Ruminant Nutrition 3
- BISC 401 Immunology 3
- BISC 602 Molecular Biology of the Cell 3
- BISC 650 Bacterial Physiology 3
- BISC 653 Recent Advances in Molecular Biology 3
- BISC 654 Biochemical Genetics 3
- BISC 658 Developmental Genetics 3
- BISC 671 Immunobiology 3
- BISC 677 Virology 3
- BISC 693 Human Genetics 3
- CHEM 220 Quantitative Analysis 3
- CHEM 418 Introductory Physical Chemistry 3
- COMA 350 Public Speaking 3
- ENGL 312 Written Communications in Business 3
- FOSC 439/639 Food Microbiology 4
- FOSC 449/469 Fermentation Technology 4

CREDITS TO TOTAL A MINIMUM OF 130

DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE
MAJOR: ANIMAL SCIENCE
CONCENTRATION: PREVETERINARY MEDICINE

All requirements for the General Animal Science program must be met. The following courses are also required for the concentration:

Within the Concentration

- ANSC 201 Behavior of Domestic Animals 3
- ANSC 441 Reproductive Physiology 3
- CHEM 213 Elementary Organic Chemistry 4
- CHEM 214 Elementary Biochemistry 3
- CHEM 216 Elementary Biochemistry Laboratory 1
- ENTO 205 Elements of Entomology 3
- FOSC 401 Agronomic Crop Science 3
- FREC 350 Farm Management 3
- PLSC 401 Agronomic Crop Science 3

Select a minimum of two courses from the following:

- ANSC 404 Dairy Production 3
- ANSC 407 Beef Cattle and Sheep Production 4
- ANSC 418 Swine Production 4
- ANSC 421 Poultry Production 4

ELECTIVES

- Electives 21-24
  May include Military Science, Music, or Physical Education. (Only four credits of activity-type Physical Education and/or four credits of performing Music organization credit may be counted toward the degree.)

  Recommended Electives

- ANSC 270 Biotechnology: Science and Socioeconomic Issues 3
- ANSC 420 Equine Management 4
- ANSC 431 Infection and Immunity in Animal Diseases 4
- BISC 371 Introduction to Microbiology 4
- COMA 312 Oral Communication in Business 3
- ENGL 312 Written Communications in Business 3
- EGTE 329 Agricultural Waste Management Systems 3
- FOSC 401 Agronomic Crop Science 3
- FOSC 439/639 Food Microbiology 4
- FOSC 449/469 Fermentation Technology 4

CREDITS TO TOTAL A MINIMUM OF 130

REQUIREMENTS FOR A MINOR IN ANIMAL SCIENCE

The minor in animal science requires 16-18 credits in animal science including the following: ANSC 101; 111; 251; and one course from ANSC 201, 431, 441, or 446; and one course from ANSC 404, 417, 418, 420, and 421.

DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE
MAJOR: FOOD SCIENCE
CURRICULUM

COLLEGE OF AGRICULTURAL SCIENCES • ANIMAL AND FOOD SCIENCES
Agricultural and Biological Sciences 9-12
Minimum of one course outside the student’s major in three of the following areas: Food and Resource Economics, Agricultural Engineering, Animal Science, Entomology and Applied Ecology, Plant and Soil Sciences, or Biology.

Literature and Arts 6
Six credits selected from the general areas of English, Art, Art History, Communication, Music, Theatre, or Foreign Language

Social Sciences and Humanities 9
Minimum of one course in three of the following areas: Anthropology, Black American Studies, Criminal Justice, Economics, Education, Geography, History, Philosophy, Political Science, Psychology, Sociology, or Women’s Studies

Physical Sciences 8
Minimum of eight credits selected from one of the following areas: Chemistry, Physics, Geology, or Physical Science.

MAJOR REQUIREMENTS
A course may be applied toward both the major requirement and a college requirement, but credits are counted only once toward the total credits for graduation.

External to the College
CHEM 103 General Chemistry 4
CHEM 104 General Chemistry 4
CHEM 214 Elementary Biochemistry 3
CHEM 220 Quantitative Analysis I 4
CHEM 221 Quantitative Analysis Laboratory 1
PHYS 201 Introductory Physics I 4
PHYS 202 Introductory Physics II 4
BISC 207 Introductory Biology I 3
BISC 208 Introductory Biology II 4
BISC 371 Introduction to Microbiology 4
CHEM 321 Organic Chemistry 4
CHEM 322 Organic Chemistry 4
CHEM 418 Introductory Physical Chemistry 3
CHEM 419 Introductory Physical Chemistry 3
or
CHEM 527 Introductory Biochemistry 3
CHEM 445 Physical Chemistry Laboratory 3
NDT 200 Nutrition Concepts 3
ECON 151 Introduction to Microeconomics: Prices and Markets 3
PSYC 201 General Psychology 3
MATH 221 Calculus I 4
MATH 222 Calculus II 4
MATH 241 Analytic Geometry and Calculus A 4
MATH 242 Analytic Geometry and Calculus B 4

Within the College
FREC 135 Introduction to Data Analysis 3
FREC 408 Research Methods 3

Within the Department
A minimum grade of C must be achieved for credits to count toward the fulfillment of 36 credits in FS, a minimum grade of 2.00 in 200-level courses must be achieved to proceed to upper-level courses, only 300-level courses and a maximum of four credits of Special Problems/Independent Study (FOSC 466) may count toward the fulfillment of this requirement.

FOSC 265 Seminar: Food Science 2
FOSC 359 Topics in Food Science 1
FOSC 365 Seminar: Food Science 1
FOSC 409 Food Processing I 4
FOSC 410 Food Processing II 4
FOSC 428 Food Chemistry 4
FOSC 429 Food Analysis 4
FOSC 439 Food Microbiology 4
FOSC 445 Food Engineering Technology 4
FOSC 446 Food Processing Engineering Technology 4
FOSC 449 Food Biotechnology 4

ELECTIVES

Electives 2-4
May include Military Science, Music, or Physical Education. (Only two credits of activity-type Physical Education and four credits of Music organization credits and four credits of 100- and 200-level courses in Military Science/Air Force may be counted toward the degree.)

CREDITS TO TOTAL A MINIMUM OF 132

MINOR IN FOOD SCIENCE
The following minor in food science requires application and admission to the program and successful completion of 15 food science credits. The minor in Food Science provides students in other degree programs with an opportunity to acquaint themselves with food science. Completion of the minor will provide the student with a basic understanding of this complex technology which includes sciences as diverse as microbiology and engineering. Since Food Science is a multidisciplinary applied science, any student in any curriculum may minör in food science; however, the exact course requirements will be determined by the FSC minor adviser. Course selection would depend on completion of prerequisites and other science and math preparation.

Student Eligibility Requirements
1. The minor is awarded only to students who have applied and been admitted to the program.
2. A C grade or 2.00 or higher is required in all FOSC courses for the minor in Food Science. The minor in Food Science requires a minimum of 15 food science credits. Required FOSC 305/306 (3), and any 3 other FOSC courses.
3. Successful completion of mathematics courses are required prior to taking food science courses for the minor.

MATH 221 Calculus I (3) and
MATH 222 Calculus II (3)

Number of credits required: 15
FOSC 305/306 Food Science & Laboratory 3

Select any 3 courses (12 credits) from:
FOSC 409 Food Processing I 4
FOSC 410 Food Processing II 4
FOSC 428 Food Chemistry 4
FOSC 429 Food Analysis 4
FOSC 439 Food Microbiology 4
FOSC 445 Food Engineering Technology 4
FOSC 446 Food Processing Engineering Technology 4
FOSC 449 Food Biotechnology 4

Prerequisites may be waived. Permission of instructor to register is based on individual student academic record and major. See a food science faculty member for advisement on readiness for specific FOSC courses and course selection for the minor.

CREDITS TO TOTAL A MINIMUM OF 15

ENTOMOLOGY AND APPLIED ECOLOGY

Entomology emphasizes the structure, physiology, behavior, development, ecology, classification, and management of insects. Applied ecology uses practical methods to manage interrelationships of organisms with each other and their nonliving environment. Pest management and wildlife conservation are examples of applied ecology. Wildlife conservation is the effort to perpetuate free-living, breeding populations of non-domestic species.

The Department offers two concentrations in the major. Students can focus their biological interest in insects in the General Entomology Concentration. This program requires basic sciences as well as specialty courses on insects. Some flexibility in insect, plant science, and biology courses permits students to emphasize pest management or insect biology. The Wildlife Conservation Concentration is for students with interests in the biological aspects of environmental science, e.g., conservation, wildlife biology, or ecology. It requires basic sciences, specialty courses in vertebrates, insects, plants, and conservation and other supporting courses. The curriculum’s flexibility accommodates career goals ranging from research to nature education, conservation advocacy and wildlife management. The department also co-offers Natural Resource Management and Entomology/Plant Pathology, as interdisciplinary majors.

The faculty advisor and student jointly plan the course program according to the student’s career objective. Course selection should be made in consultation with the academic advisor during the preregistration period of each term.
### DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE
#### MAJOR: ENTOMOLOGY
##### CONCENTRATION: GENERAL ENTOMOLOGY

<table>
<thead>
<tr>
<th>CURRICULUM</th>
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<tbody>
<tr>
<td><strong>UNIVERSITY REQUIREMENTS</strong></td>
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<tr>
<td>ENGL 110 Critical Reading and Writing (with minimum grade of C)</td>
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</tr>
<tr>
<td>Three credits in an approved course or courses stressing multicultural, ethnic, and/or gender-related content (see p. 20)</td>
<td>3</td>
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<tr>
<td><strong>COLLEGE REQUIREMENTS</strong></td>
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<tr>
<td>Mathematics and Computer Science</td>
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<td>Mathematics course (MATH 115, 171 or higher level)</td>
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</tr>
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<td>Computer Science course selected from CISC 105, EGTE 111, FREC 135, or equivalent</td>
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<td><strong>Agricultural and Biological Sciences</strong></td>
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<tr>
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<tr>
<td>AGRI 211 Literature of Agricultural and Life Sciences</td>
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<tr>
<td>BISC 207 Introductory Biology I</td>
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<td>ENTO 205 Elements of Entomology</td>
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<tr>
<td>ENTO 305 Entomology Laboratory</td>
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<td>ENTO 405 Insect Identification—Taxonomy</td>
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<td>ENTO 300 Principles of Animal and Plant Genetics</td>
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**CREDITS TO TOTAL A MINIMUM OF** 124

### DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE
#### MAJOR: ENTOMOLOGY
##### CONCENTRATION: WILDLIFE CONSERVATION

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**CREDITS TO TOTAL A MINIMUM OF** 124


**ENTOMOLOGY AND APPLIED ECOLOGY • COLLEGE OF AGRICULTURAL SCIENCES**

**BISC 494** Experimental Ecology .................................................. 3
**BISC 495** Evolution ........................................................................ 3
**BISC 680** Vertebrate Natural History .................................................. 4
**ENTO 300** Principles of Animal and Plant Genetics ............................ 3
**ENTO 310** Animal and Plant Genetics Laboratory ............................... 1
*(same as PLSC 300, 310; may not count for both Group II and III)*

**GROUP III** — 6 credits from the following:

- **PLSC 101** Botany I ........................................................................ 4
- **PLSC 201** Botany II ...................................................................... 4
- **PLSC 300** Principles of Animal and Plant Genetics ....................... 3
- **PLSC 310** Animal and Plant Genetics Lab ..................................... 1
*(same as ENTO 300, 310; may not count for both Group II and III)*
- **PLSC 402** Plant Taxonomy ............................................................. 3
- **PLSC 410** Introduction to Plant Physiology .................................... 3

**GROUP IV** — 6 credits from the following:

Only 3 credits may count toward the College literature and Arts Group Requirement

**COMM 255** Fundamentals of Communication .................................... 3
**COMM 312** Oral Communication in Business ...................................... 3
**COMM 350** Public Speaking ............................................................... 3
**ENGL 301** Expository Writing .......................................................... 3
**ENGL 305** News Writing and Editing ................................................ 3
**ENGL 309** Feature and Magazine Writing ......................................... 3
**ENGL 312** Written Communications in Business ............................. 3
**ENGL 410** Technical Writing ............................................................. 3
**THEA 102** Introduction to Performance ............................................ 3
**THEA 204** Introduction to Voice and Speech ..................................... 3
**THEA 220** Movement and Non-Verbal Communication I .................... 3

**GROUP V** — 6 credits from the following:

- **EGTE 111** Computer Applications in Engineering Technology ........ 3
- **CISC 105** General Computer Science ............................................. 3
- **GEOG 250** Computer Methods in Geography ................................ 4
- **FREC 408** Research Methods ........................................................ 3
**MATH 203** Calculus I ...................................................................... 3
**MATH 222** Calculus II .................................................................... 3
**MATH 230** Finite Mathematics with Applications ............................. 3
**STAT 201** Introduction to Statistics I ................................................. 3
**STAT 202** Introduction to Statistics II ............................................... 3

**GROUP VI** — 6 credits from the following:

- **ECIS 151** Introduction to Microeconomics: Prices and Markets ........ 3
- **FREC 150** Economics of Agriculture and Natural Resources ........... 3
*(Either of two previous courses is prerequisite to FREC 242, 444)*
- **FREC 423** Resource Economics: Theory and Policy ....................... 3
- **FREC 444** Economic Environmental Management .......................... 3
- **GEOG 234** Earth Resources and Ecology ....................................... 3
- **GEOG 421** Environmental and Applied Geology ........................... 3
- **GEOG 253** Conservation: Global Issues ......................................... 3
- **POS 105** The American Political System ........................................ 3
- **POS 220** Introduction to Public Policy ............................................ 3
**SOC 350** Politics and the Environment ............................................. 3
**SOC 210** Population Problems ......................................................... 3

**ELECTIVES**

**Electives** ......................................................................................... 12

Number of elective credits depends on number of courses chosen for concentration groups that also satisfy college requirements. May include: Military Science, Music, or Physical Education. (Only four credits of activity-type, Physical Education and/or four credits of performing Music organization credit may be counted toward the degree.)

**CREDITS TO TOTAL A MINIMUM OF ................................................... 124**

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**REQUIREMENTS FOR A MINOR IN ENTOMOLOGY**

The minor in entomology requires 15 credits of courses with an ENTO prefix, including: ENTO 205, 305, and 406. A student may emphasize general entomology or wildlife conservation by proper choice of ENTO courses for the remaining 7 credits. A minimum grade of C is required in all courses counting toward the major. Credits for Special Problem, Independent Study, Research, and Field Experience do not count toward the minor.

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**ENTOMOLOGY/PLANT PATHOLOGY**

Because of mutual interests and problems in the field of plant protection, the Department of Entomology and Applied Ecology and the Department of Plant and Soil Sciences offer a joint major, entomology/plant pathology (EPP). In a world of expanding population and increasing pressure on supplies of food and fiber, both plant pathology and entomology offer the challenge and satisfaction of a career that contributes to human welfare. This combined major allows students to study both insects and plant diseases. It includes courses emphasizing recognition of pests and their symptoms and strategies for pest management compatible with the agricultural system and the environment.

Students majoring in EPP are neither entomology nor plant science majors and therefore are not subject to any special requirements of either department.

**DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE**

**MAJOR: ENTOMOLOGY/PLANT PATHOLOGY**

**CURRICULUM**

**CREDITS**

**UNIVERSITY REQUIREMENTS**

<table>
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<th>Course</th>
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<td>ENGL 110</td>
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<tr>
<td>English and/or other language requirement</td>
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</table>

**COLLEGE REQUIREMENTS**

- Mathematics and Computer Science
  - Mathematics course (MATH 115 or higher level) .................................. 3
  - Computer Science course selected from CISC 105, EGTE 111, FREC 135, or equivalent .................................................. 3

- Agricultural and Biological Sciences
  - Minimum of one course outside the student's major in three of the following areas: Food and Resource Economics, except FREC 135, Food Science, Agricultural Engineering, Animal Science, Entomology, and Applied Ecology, Plant and Soil Sciences, or Biology

- Literature and Arts
  - Six credits selected from the general areas of English, Art, History, Communication, Music, Theatre, or Foreign Language

- Social Sciences and Humanities
  - Minimum of one course in the following areas: Anthropology, Black American Studies, Criminal Justice, Economics, Education, Geography, History, Philosophy, Political Science, Psychology, Sociology, or Women's Studies

- Physical Sciences
  - Eight credits selected from one of the following areas: Chemistry, Physics, Geology, or Physical Science

**MAJOR REQUIREMENTS**

- External to the College
  - BISC 207 Introductory Biology I ................................................ 4
  - BISC 208 Introductory Biology II ................................................. 4
  - CHEM 101/102 General Chemistry ................................................. 8
  - CHEM 103/104 General Chemistry ................................................. 8

- Within the College
  - AGRI 211 Literature of the Agricultural and Life Sciences ............ 1

- Within the Departments
  - ENTO 205 Elements of Entomology ............................................. 3
  - ENTO 305 Entomology Laboratory .................................................. 2
  - ENTO 406 Insect Identification-Taxonomy ..................................... 3
  - ENTO 408 Field Taxonomy ............................................................. 2
  - ENTO 411 Economic Entomology .................................................. 3
  - ENTO 465 Seminar ....................................................................... 1
  - PLSC 101 Botany I ........................................................................ 4
  - PLSC 201 Botany II ........................................................................ 4
  - PLSC 303 Introductory Plant Pathology .......................................... 4
  - PLSC 411 Diagnostic Plant Pathology ............................................. 3

Sixteen credits from Entomology and Applied Ecology and/or Plant Science (may include 3 credits maximum of Independent Study, Research and Field Experience) 16
ELECTIVES

**Electives**

Courses in Agriculture, Biology, and the Physical Sciences are recommended. Only two credits of activity-type Physical Education and/or two credits of performing Music organization credit may be counted toward the degree.

**CREDITS TO TOTAL A MINIMUM OF** .................................................. 124

The choice of department in which to complete the remaining credits provides the student with the opportunity to emphasize either applied entomology or plant pathology in his or her program. Students should complete their programs with electives that will provide an education best suited to their goals. Course election should be made in consultation with the academic advisor during the preregistration period of each term. This program should include other courses in agriculture, biology, and physical sciences.

### FOOD AND RESOURCE ECONOMICS

The study of food and resource economics is concerned with agribusiness management, food marketing, and the economics of resource management and production in the agribusiness complex. Courses and curricula are designed to provide a thorough background in the principles of organization and management of agribusiness firms serving agriculture and food processing businesses. Food and resource economics also includes study of financing agricultural business firms, marketing and international trade of agricultural products, price analyses, economics of land utilization, and agricultural and environmental policies.

Two major programs are offered: (a) food and agribusiness management and (b) agricultural economics. The curricula differ in the amount of emphasis given to agricultural production, business and economics. Both curricula qualify the student for graduate work. The department also co-offers Natural Resource Management, an interdisciplinary major.

The curriculum in food and agribusiness management is offered cooperatively with the College of Business and Economics. This curriculum prepares the student for a career in agribusiness sales and marketing, food wholesaling and retailing, international trade, resource management, market analysis, finance and banking, and commodity marketing (futures and options). A concentration in food marketing is offered as part of the food and agribusiness management major.

The curriculum in agricultural economics emphasizes resource and environmental economics, production economics and agricultural marketing, and provides a solid foundation in economics and business. It prepares the student to work in the fields of agriculture, government, teaching, extension and research. Two concentrations are offered as part of the agricultural economics major: production and management, and resource economics and rural development.

---

**DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE**

**MAJOR: FOOD AND AND AGRIBUSINESS MANAGEMENT**

**CURRICULUM**

**UNIVERSITY REQUIREMENTS**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110</td>
<td>Critical Reading and Writing (minimum grade C)</td>
<td>3</td>
</tr>
<tr>
<td>Three credits in an approved course or courses stressing multicultural, ethnic, and/or gender-related content (see p. 20)</td>
<td>3</td>
<td></td>
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**COLLEGE REQUIREMENTS**

<table>
<thead>
<tr>
<th>Mathematics and Computer Science</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics course (MATH 115 or higher level, MATH 221, MATH 230, and STAT 201 are strongly recommended)</td>
<td>3</td>
</tr>
<tr>
<td>Computer Science course (FREC 135 or equivalent)</td>
<td>3</td>
</tr>
<tr>
<td>AGR 165</td>
<td>1</td>
</tr>
<tr>
<td>Agricultural and Biological Sciences</td>
<td>9-12</td>
</tr>
</tbody>
</table>

Minimum of one course outside the student's major in three of the following areas: Food and Resource Economics, Agricultural Engineering, Animal Science, Food Science, Entomology and Applied Ecology, Plant and Soil Sciences, or Biology.

**Literature and Arts**

<table>
<thead>
<tr>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Six credits selected from the general areas of English, Art, Art History, Communication, Music, Theatre, or Foreign Language</td>
</tr>
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</table>

**Social Sciences and Humanities**

<table>
<thead>
<tr>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum of one course in three of the following areas: Anthropology, Black American Studies, Criminal Justice, Economics, Education, Geography, History, Philosophy, Political Science, Psychology, Sociology, or Women's Studies</td>
</tr>
</tbody>
</table>

**Physical Sciences**

<table>
<thead>
<tr>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum of eight credits, selected from one of the following two-course sequences: SCEN 101 and 102, GEOL 105 and 106, CHEM 101/102 or 103/104</td>
</tr>
</tbody>
</table>

**ELECTIVES**

<table>
<thead>
<tr>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>26-29</td>
</tr>
</tbody>
</table>

**FREE ELECTIVES**

May include Military Science, Music, or Physical Education. Only four credits of activity-type Physical Education and/or four credits of performing Music organization credit may be counted toward the degree.

Included in the free electives are suggested Food and Resource Economics courses from the following areas:

**Suggested Food and Agribusiness Management Electives:**

FREC 312 Food Retailing and Product Management
FREC 335 Advanced Data Management
FREC 427 Agribusiness Financial Management
FREC 471 Futures and Options Markets
FREC 464 Agribusiness Management

**Suggested Resource Management Electives:**

FREC 406 Agriculture and Natural Resource Policy
FREC 424 Resource Economics
FREC 429 Community Economic Development
FREC 444 Economics of Environmental Management
FREC 480 Geographic Information Systems in Natural Resource Management

**Suggested Communications and Writing Electives:**

ENGL 301 Expository Writing
ENGL 410 Technical Writing

**CREDITS TO TOTAL A MINIMUM OF** .................................................. 128
DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE
MAJOR: FOOD AND AGRIBUSINESS MANAGEMENT
CONCENTRATION: FOOD MARKETING

The requirements for the major of Food and Agribusiness Management must be met. The following department courses are required for the concentration and may also be used as electives in the Food and Agribusiness Management major:

FREC 312 Food Retailing and Product Management ........................................... 3
FREC 335 Advanced Data Management .............................................................. 3
FREC 427 Agribusiness Financial Management .................................................... 3
FREC 471 Futures and Options Markets .............................................................. 4

Two Business Administration Courses at the 400-level in marketing related areas. These are in addition to BUAD 301-Introduction to Marketing and two additional Business and Economics courses at the 300 and 400 level required by the Food and Agribusiness Management major.

CREDITS TO TOTAL A MINIMUM OF ......................................................... 128

REQUIREMENTS FOR A MINOR IN FOOD AND AGRIBUSINESS MANAGEMENT

The minor in Food and Agribusiness Management requires 18 credits of courses with the FREC prefix including FREC 150 - Economics of Agriculture and Natural Resources. Students must also take five of the eight FREC courses listed below with a minimum of two courses in each area:

Marketing/Management Area:
FREC 345 Strategic Selling and Buyer Communication ..................................... 3
FREC 404 Food and Fiber Marketing .................................................................. 3
FREC 405 Management and Leadership Development ........................................ 3
FREC 471 Futures and Options Markets .............................................................. 4

Decision Analysis/International Trade Area:
FREC 408 Research Methods I .......................................................................... 3
FREC 409 Research Methods II ........................................................................... 3
FREC 410 International Agricultural Trade and Marketing ................................. 3
FREC 427 Agribusiness Financial Management .................................................... 3

A minimum grade of C is required in all courses counting toward the minor.

DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE
MAJOR: AGRICULTURAL ECONOMICS

CURRICULUM

CREDITS

UNIVERSITY REQUIREMENTS
ENGL 110 Critical Reading and Writing (with a minimum grade of C).............. 3
Three credits in an approved course or courses stressing multicultural, ethnic, and/or gender-related content (see p. 20) .................................................. 3

COLLEGE REQUIREMENTS
Mathematics and Computer Science
Mathematics course (MATH 155 or higher level; MATH 221, MATH 230, and
STAT 201 are strongly recommended) ............................................................. 3
Computer Science course (FREC 315 or equivalent) ......................................... 3
Agricultural and Biological Sciences ..................................................................... 9

Minimum of one course outside the student's major in three of the following areas: Food and Resource Economics, Food Science, Agricultural Engineering, Animal Science, Entomology and Applied Ecology, Plant and Soil Sciences, or Biology

Literature and Arts
Six credits selected from the general areas of English, Art, Art History, Communication, Music, Theatre, or Foreign Language ................................................. 6

Social Sciences and Humanities
Minimum of one course in three of the following areas: Anthropology, Black American Studies, Criminal Justice, Economics, Education, Geography, History, Philosophy, Political Science, Psychology, Sociology, or Women's Studies ......................................................... 9

Physical Sciences
Minimum of eight credits selected from one of the following two-course sequences:
SCEN 101 and 102
CHEM 101A and 102B or 105/106
PHYS 201 or 202 or 207/208

ELECTIVES

130

DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE
MAJOR: AGRICULTURAL ECONOMICS
CONCENTRATION: PRODUCTION AND MANAGEMENT

The requirements for the major in Agricultural Economics must be met. In addition, the following courses must be taken:
FREC 350 Economics of Agriculture and Natural Resources ............................... 3
FREC 435 Introduction to Agribusiness Management .......................................... 3
FREC 436 Management and Leadership Development ........................................ 3
FREC 444 Economics of Environmental Management ......................................... 3
FREC 445 Agribusiness Financial Management .................................................... 3
FREC 465, FREC 630, and Independent Study may not be counted in the seven courses.

A maximum of three credits of Independent Study in Food and Resource Economics and a maximum of six credits of Independent Study in all areas, including Food and Resource Economics, may be counted toward a degree.

CREDITS TO TOTAL A MINIMUM OF ......................................................... 130
DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE
MAJOR: AGRICULTURAL ECONOMICS
CONCENTRATION: RESOURCE ECONOMICS AND RURAL DEVELOPMENT

The requirements for the major in Agricultural Economics must be met.
In addition, the following courses must be taken:
FREC 424 Resource Economics—Theory and Policy 3
FREC 429 Rural Economics Development—Theory and Policy 3
FREC 445 Economics of Environmental Management 3

Agricultural Economics (FREC) courses required for the Agricultural Economics major may be used to satisfy requirements for the Resource Economics and Rural Development concentration.

One course in Geography 3

In addition to the Business and Economics courses required for the Agricultural Economics major, four of the following courses, with at least one in each area, must be taken:

1. Political Economy
   - ECON 306 Economic Theory of Politics 3
   - ECON 311 Economics of Developing Countries 3
   - ECON 408 Economics of Law 3
   - ECON 411 Economics of Growth and Development 3

2. Quantitative Methods
   - ECON 415 Econometric Methods 3
   - ECON 422 Econometric Methods and Models I 3
   - ECON 423 Econometric Methods and Models II 3
   - ECON 426 Mathematical Economic Analysis 3

3. Applications
   - ECON 433 Economics of the Public Sector 3
   - ECON 475 Economics of Natural Resources 3
   - ECON 477 Benefit Cost Analysis 3

CREDITS TO TOTAL MINIMUM OF 130

PLANT AND SOIL SCIENCES

Plant and Soil Sciences includes disciplines of study that apply chemical, biological, and physical principles toward insuring adequate food supplies in a safe and aesthetic environment. Faculty in the department have active teaching and research programs in plant molecular biology, botany, anatomy, physiology, taxonomy, genetics, plant breeding, cell and tissue culture, pathology, ornamental horticulture, landscape design, crop and vegetable science, soil chemistry, soil management, soil physics, and soil microbiology. Undergraduate students often are involved in some aspect of these research programs, which strengthens and broadens their understanding of science.

Students pursue a program of study leading to the degree Bachelor of Science in Agriculture. They can major in Plant Science and select one of four areas of concentration: general plant science, ornamental horticulture, agronomy, or pathology, or they can major in Environmental Soil Science. The department also co-offers Natural Resource Management, an interdisciplinary major.

Each candidate for a degree must earn a minimum of 124 credits; achieve a minimum cumulative grade point average of 2.00 on all work undertaken at the University of Delaware, and fulfill the course requirements of the degree program.

DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE
MAJOR: PLANT SCIENCE
CONCENTRATION: GENERAL PLANT SCIENCE

CREDITS TO TOTAL A MINIMUM OF 124

DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE
MAJOR: PLANT SCIENCE
CONCENTRATION: ORNAMENTAL HORTICULTURE

The requirements for the degree in General Plant Science must be met. In addition, the following courses must be taken:

Within the Concentration

Group One: Required courses

PLSC 101 Botany I 4
PLSC 201 Botany II 4
PLSC 204 Introduction to Soil Science 4
PLSC 301 Principles of Animal and Plant Genetics 4
PLSC 303 Introductory Plant Pathology 4
PLSC 305 Environmental Soil Management 4
PLSC 410 Introduction to Plant Physiology 3

Within the Department

CHEM 101 General Chemistry 4
CHEM 102 General Chemistry 4
CHEM 103 General Chemistry 4
CHEM 213 Elementary Organic Chemistry 4

One of the following three courses:

PHYS 101 Introduction to Physics 4
GEOG 105 General Geology 3
CHEM 214 Elementary Biochemistry 3

ELECTIVES

46–50

May include Military Science, Music, or Physical Education. Only two credits of activity-type Physical Education and/or two credits of performing Music organization credit may be counted toward the degree. Elective credits will be reduced for students choosing one of the following three optional concentrations:

CREDITS TO TOTAL A MINIMUM OF 124
### ELECTIVES

**Electives**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110</td>
<td>Critical Reading and Writing (minimum grade C)</td>
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<td>Three credits in an approved course or courses stressing multicultural, ethnic, and/or gender-related content (see p. 20.</td>
</tr>
</tbody>
</table>

**Credits to Total a Minimum of**: 124

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### DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE MAJOR: PLANT SCIENCE

#### CONCENTRATION: AGRONOMY

The requirements for the degree in General Plant Science must be met. In addition, the following courses must be taken:

**Within the Concentration**

**Group one: Required courses**

- PLSC 151 Introduction to Crop Science: 3 credits
- PLSC 401 Agronomic Crop Science: 3 credits
- PLSC 411 Diagnostic Plant Pathology: 3 credits
- CHEM 214 Elementary Biochemistry: 3 credits
- CHEM 216 Elementary Biochemistry Laboratory: 1 credit
- ENTO 205 Entomology Laboratory: 3 credits
- ENTO 305 Entomology Laboratory: 2 credits

**Group two: Select a minimum of 12 credits from the following courses:**

- PLSC 607 Plant Pathology: 3 credits
- PLSC 608 Plant Breeding: 3 credits
- PLSC 622 Plant and Soil Water Relations: 3 credits
- PLSC 623 Plant Microbiology: 3 credits
- ENTO 465 Seminar: 1 credit

**Credits to Total a Minimum of**: 124

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### DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE MAJOR: PLANT SCIENCE

#### CONCENTRATION: PATHOLOGY

The requirements for the degree in General Plant Science must be met. In addition, the following courses must be taken:

**Within the Concentration**

**Group one: Required courses**

- BISC 207 Introductory Biology I: 4 credits
- BISC 208 Introductory Biology II: 4 credits
- BISC 371 Introductory Microbiology: 4 credits
- ENTO 305 Entomology Laboratory: 2 credits

**Group two: Select a minimum of 12 credits from the following courses:**

- PLSC 401 Agronomic Crop Science: 3 credits
- PLSC 411 Diagnostic Plant Pathology: 3 credits
- PLSC 413 Principles of Plant Disease Control: 3 credits
- PLSC 429 Introductory Mycology: 4 credits
- PLSC 430 Environmental and Applied Geology: 3 credits
- PLSC 431 Environmental and Applied Geology Laboratory: 1 credit
- ENTO 305 Entomology Laboratory: 2 credits
- ENTO 305 Entomology Laboratory: 2 credits
- BISC 321 Environmental Biology: 3 credits

**Credits to Total a Minimum of**: 124

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### COLLEGE REQUIREMENTS

#### Mathematics and Computer Science

- **Mathematics course**: 3 credits
- **Computer Science course selected from CISC 105, EGTE 111, or FREC 135, or equivalent**: 3 credits

#### Agricultural and Biological Sciences

Minimum of one course outside the student's major in three of the following areas: Food and Resource Economics, Food Science, Agricultural Engineering, Animal Science, Entomology and Applied Ecology, or Biology

#### Literature and Arts

Six credits selected from the general areas of English, Art, Art History, Communication, Music, Theatre, or Foreign Language.

#### Social Sciences and Humanities

Minimum of one course in three of the following areas: Anthropology, Black American Studies, Criminal Justice, Economics, Education, Geography, History, Philosophy, Political Science, Psychology, Sociology, or Women's Studies

#### Physical Sciences

Minimum of eight credits selected from one of the following areas: Chemistry, Physics, Geology, or Physical Science.

#### MAJOR REQUIREMENTS

A course may be applied toward both the major requirements and a college requirement, but credits will be counted only once toward graduation.

**External to the College**

- CHEM 101 General Chemistry: 4 credits
- CHEM 102 General Chemistry: 4 credits
- CHEM 213 Organic Chemistry: 4 credits
- CHEM 220 Quantitative Analysis: 4 credits
- CHEM 221 Quantitative Analysis Laboratory: 1 credit
- ENGL 413 Technical Writing: 4 credits
- GEOG 220 Meteorology: 3 credits
- GEOL 107 General Geology I: 4 credits
- MATH 221 Calculus I: 3 credits
- PHYS 201 Introductory Physics I: 4 credits

**Within the College**

- EGTE 103 Land and Water Management: 2 credits
- EGTE 113 Land Surveying: 2 credits
- EGTE 328 Agricultural Waste Management: 3 credits
- FREC 160 Economics of Agriculture and Natural Resources: 3 credits

**Within the Department**

- PLSC 101 Botany I: 4 credits
- PLSC 151 Introduction to Crop Science: 3 credits
- PLSC 204 Introduction to Soil Science: 4 credits
- PLSC 303 Introductory Plant Pathology: 4 credits
- PLSC 305 Environmental Soil Management: 4 credits
- PLSC 401 Agronomic Crop Science: 3 credits
- PLSC 407 Soil Management: 3 credits
- PLSC 619 Soil Microbiology: 3 credits

#### ELECTIVES

- **Electives**: 14-17 credits
- **Electives**: 20-24 credits
- **Electives**: 18-20 credits

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### NATURAL RESOURCE MANAGEMENT

Natural Resource Management is an interdepartmental major administered by the Departments of Entomology and Applied Ecology, Food and Resource Economics, and Plant and Soil Sciences. The
purpose of the major is to teach an understanding of the social, physical, economic, legal, and political problems of managing the use and perpetuation of natural resources in the 21st century, together with the skills and capabilities to address those problems in the public or private forums. It combines education in the basic and applied biological and physical sciences with the fundamentals of public policy formulation.

The curriculum includes courses to help students understand the natural sciences, mathematics and statistics, economics and public policy; appreciate the world's biodiversity; communicate effectively; use computers to manage information; and solve "real world" problems. Students will also have a broad interdisciplinary education in the arts, humanities, social sciences and environmental ethics.

The major is offered jointly by three Departments within the College of Agricultural Sciences: Entomology and Applied Ecology, Food and Resource Economics and Plant and Soil Sciences. Students will be advised by faculty in those departments.

Interested students should contact Dr. Steven Hastings, 229 Townsend Hall (302-831-1318).

**DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE**

**MAJOR: NATURAL RESOURCE MANAGEMENT**

**CURRICULUM**

**CREDITS**

**UNIVERSITY REQUIREMENTS**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
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<td>ENGL 110</td>
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<td>Three credits in an approved course or courses stressing multicultural, ethnic, and/or gender-related content (see p. 20)</td>
<td>3</td>
</tr>
</tbody>
</table>

**COLLEGE REQUIREMENTS**

| Mathematics and Computer Science | 9 |
| Computer Science Course | 3 |
| Agricultural and Biological Sciences | 9-12 |
| Minimum of one course in the following areas: Food and Resource Economics, Agricultural Engineering, Animal and Food Science, Entomology and Applied Ecology, Plant and Soil Sciences, or Biology | 6 |
| Literature and Arts | 6 |
| Six credits selected from the general areas of English, Art, Art History, Communication, Music, Theatre, or Foreign Language | 6 |
| Social Sciences and Humanities | 9 |
| Minimum of one course in the following areas: Anthropology, Black American Studies, Criminal Justice, Economics, Education, Geography, History, Philosophy, Political Science, Psychology, Sociology, or Women's Studies | 9 |
| Physical Sciences | 8 |
| Minimum of eight credits selected from the following areas: Chemistry, Physics, Geology or Physical Science | 8 |

**MAJOR REQUIREMENTS**

Courses taken to satisfy Major Requirements may be used to satisfy University and College Requirements.

**External to and within the College**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>AGRI 165</td>
<td>Mastering the Freshman Year</td>
<td>1</td>
</tr>
<tr>
<td>or any equivalent Department freshman seminar</td>
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<td></td>
</tr>
<tr>
<td>BISC 207</td>
<td>Introductory Biology I</td>
<td>4</td>
</tr>
<tr>
<td>BISC 208</td>
<td>Introductory Biology II</td>
<td>4</td>
</tr>
<tr>
<td>or PLSC 101</td>
<td>Botany I</td>
<td>4</td>
</tr>
<tr>
<td>or CHEM 101</td>
<td>General Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>or CHEM 103</td>
<td>General Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>or CHEM 104</td>
<td>General Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>ECON 151</td>
<td>Introduction to Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 152</td>
<td>Introduction to Microeconomics</td>
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</tr>
<tr>
<td>MATH 221</td>
<td>Calculus I</td>
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<tr>
<td>MATH 222</td>
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<tr>
<td>FREC 135</td>
<td>Introduction to Data Analysis</td>
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<tr>
<td>FREC 150</td>
<td>Economics of Agriculture and Natural Resources</td>
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<tr>
<td>FREC 424</td>
<td>Resource Economics: Theory and Policy</td>
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<tr>
<td>FREC 444</td>
<td>Economics of Environmental Management</td>
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<tr>
<td>FREC 480</td>
<td>Geographic Information Systems in Natural Resource Management</td>
<td>4</td>
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<tr>
<td>PLSC 201</td>
<td>Botany II</td>
<td>4</td>
</tr>
<tr>
<td>PLSC 204</td>
<td>Introduction to Soil Science</td>
<td>4</td>
</tr>
<tr>
<td>PLSC 305</td>
<td>Environmental Soil Management</td>
<td>4</td>
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<tr>
<td>PLSC 308</td>
<td>Environmental Law and Policy</td>
<td>3</td>
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<tr>
<td>PLSC 328</td>
<td>Waste Management Systems</td>
<td>3</td>
</tr>
<tr>
<td>PLSC 408</td>
<td>Research Methods</td>
<td>3</td>
</tr>
<tr>
<td>or FREC 345</td>
<td>Strategic Selling and Buyer Communication</td>
<td>3</td>
</tr>
<tr>
<td>or ENGL 410-Writing in the Professions</td>
<td>3</td>
<td></td>
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<tr>
<td>or ENGL 415-Writing in the Professions</td>
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**Group I**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>CHEM 101</td>
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<td>CHEM 102</td>
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<tr>
<td>CHEM 103</td>
<td>Organic Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 101</td>
<td>Introductory Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 202</td>
<td>Introductory Physics II</td>
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</table>

**Group II**

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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 200</td>
<td>General Biology</td>
<td>3</td>
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<tr>
<td>ENTO 325</td>
<td>Wildlife Management</td>
<td>3</td>
</tr>
<tr>
<td>ENTO/PLSC 440</td>
<td>Integrated Disease and Pest Management</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 235</td>
<td>Conservation of Natural Resources</td>
<td>3</td>
</tr>
<tr>
<td>or GEOG 236</td>
<td>Conservation: Global Issues</td>
<td>3</td>
</tr>
<tr>
<td>or GEOG 239</td>
<td>Humans and Earth Ecosystem</td>
<td>3</td>
</tr>
<tr>
<td>or PLSC 305</td>
<td>Environmental Soil Management</td>
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</tr>
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</table>

**Group III**

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<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGL 301</td>
<td>Expository Writing</td>
<td>3</td>
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<tr>
<td>ENGL 312</td>
<td>Written Communications in Business</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 410</td>
<td>Written Communications in Business</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 415</td>
<td>Writing in the Professions</td>
<td>3</td>
</tr>
<tr>
<td>AGRI 212</td>
<td>Oral Communication in Agriculture and Natural Resources</td>
<td>3</td>
</tr>
<tr>
<td>FREC 345</td>
<td>Strategic Selling and Buyer Communication</td>
<td>3</td>
</tr>
<tr>
<td>or UNIV 401</td>
<td>Senior Thesis</td>
<td>3</td>
</tr>
</tbody>
</table>

**Group IV**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>BISC 302</td>
<td>General Ecology</td>
<td>3</td>
</tr>
<tr>
<td>ENTO 325</td>
<td>Wildlife Management</td>
<td>3</td>
</tr>
<tr>
<td>ENTO/PLSC 440</td>
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<td>GEOG 235</td>
<td>Conservation of Natural Resources</td>
<td>3</td>
</tr>
<tr>
<td>or GEOG 236</td>
<td>Conservation: Global Issues</td>
<td>3</td>
</tr>
<tr>
<td>or GEOG 239</td>
<td>Humans and Earth Ecosystem</td>
<td>3</td>
</tr>
<tr>
<td>or PLSC 305</td>
<td>Environmental Soil Management</td>
<td>4</td>
</tr>
</tbody>
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**Group V**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ENTO 205</td>
<td>Elements of Entomology</td>
<td>3</td>
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<tr>
<td>ENTO 305</td>
<td>Entomology Laboratory</td>
<td>2</td>
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<tr>
<td>ENTO 403</td>
<td>Insect Identification - Taxonomy</td>
<td>3</td>
</tr>
<tr>
<td>ENTO 318</td>
<td>Taxonomy of Birds</td>
<td>2</td>
</tr>
<tr>
<td>ENTO 418</td>
<td>Avian Biology</td>
<td>2</td>
</tr>
<tr>
<td>ENTO 425</td>
<td>Mammalogy</td>
<td>3</td>
</tr>
<tr>
<td>ENTO 426</td>
<td>Aquatic Insects</td>
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</tr>
<tr>
<td>PLSC 212</td>
<td>Aquatic Insects</td>
<td>4</td>
</tr>
<tr>
<td>PLSC 303</td>
<td>Introductory Plant Pathology</td>
<td>4</td>
</tr>
<tr>
<td>PLSC 402</td>
<td>Plant Taxonomy</td>
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**Group VI**

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<tr>
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<tbody>
<tr>
<td>BISC 371</td>
<td>Introduction to Microbiology</td>
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<tr>
<td>ENTO 205</td>
<td>Elements of Entomology</td>
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<tr>
<td>ENTO 305</td>
<td>Entomology Laboratory</td>
<td>2</td>
</tr>
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<tr>
<td>PLSC 402</td>
<td>Plant Taxonomy</td>
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**Group VII**

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<thead>
<tr>
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<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ECON 103</td>
<td>Land and Water Management</td>
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<tr>
<td>EGTE 113</td>
<td>Land Surveying</td>
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</tr>
<tr>
<td>EGTE 328</td>
<td>Waste Management Systems</td>
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<tr>
<td>GEOL 107</td>
<td>General Geology</td>
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<tr>
<td>GEOL 108</td>
<td>Physical Geology</td>
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<tr>
<td>GEOL 206</td>
<td>Physical Geography: Topography-Soils</td>
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<tr>
<td>GEOL 220</td>
<td>Meteorology</td>
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<td>GEOL 302</td>
<td>Water and Society</td>
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**Group VIII**

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<thead>
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<tbody>
<tr>
<td>ECON 306</td>
<td>Public Choice</td>
<td>3</td>
</tr>
<tr>
<td>ECON 332</td>
<td>Public Finance and Fiscal Policy</td>
<td>3</td>
</tr>
<tr>
<td>ECON 360</td>
<td>Government and Business</td>
<td>3</td>
</tr>
<tr>
<td>EGTE 416</td>
<td>Project Economics Analysis</td>
<td>3</td>
</tr>
<tr>
<td>FREC 405</td>
<td>Agriculture and Natural Resource Policy</td>
<td>3</td>
</tr>
<tr>
<td>FREC 429</td>
<td>Community Economic Development</td>
<td>3</td>
</tr>
<tr>
<td>FREC 450</td>
<td>Environmental Law and Policy</td>
<td>3</td>
</tr>
<tr>
<td>POSC 220</td>
<td>Introduction to Public Policy</td>
<td>3</td>
</tr>
<tr>
<td>POSC 350</td>
<td>Politics and the Environment</td>
<td>3</td>
</tr>
</tbody>
</table>
Within the college

Thirty additional credits from any of the following departments:

COMM 350 Public Speaking 3
COMM 200 Introduction to Human Communication Systems 3

A minimum of one course in oral communications chosen from the following:

COMM 255 Fundamentals of Communication 3

A minimum of one course in written communications chosen from the following:

ENGL 410 Technical Writing 3

Electives

After required courses are completed, sufficient elective credits must be taken to meet the minimum credit requirement for the degree. Elective credits may include Military Science, Music or Physical Education (only four credits of activity-type Physical Education and/or four credits of performing Music organization credit may be counted toward the degree).

CREDITS TO TOTAL A MINIMUM OF: 130

GENERAL AGRICULTURE

For the student who does not wish to specialize in one field, the major in general agriculture is offered

DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE

MAJOR: GENERAL AGRICULTURE

CREDITS

UNIVERSITY REQUIREMENTS

ENGL 110 Critical Reading and Writing (Minimum grade C) 3
Three credits in an approved course or courses stressing multicultural, ethnic, and/or gender-related content (see p. 20).

COLLEGE REQUIREMENTS

Mathematics and Computer Science

Mathematics course 3
Computer Science course selected from CISC 105, EGTE 111, 3
FREC 135, or equivalent

Agricultural and Biological Sciences

Minimum of one course outside the student's major in three of the following areas: Food and Resource Economics, Food Science, Agricultural Engineering, Animal Science, Entomology and Applied Ecology, Plant and Soil Sciences, or Biology 9

Literature and Arts

Six credits selected from the general areas of English, Art, Art History, Communication, Music, Theatre, or Foreign Language 6

Social Sciences and Humanities

Minimum of one course in three of the following areas: Anthropology, Black American Studies, Criminal Justice, Economics, Education, Geography, History, Philosophy, Political Science, Psychology, Sociology, or Women's Studies 9

Physical Sciences

Minimum of eight credits selected from one of the following two-course sequences: CHEM 101/102 or 103/104 8
PHYS 201/202 or 207/208
GEOL 105 and 106

External to the college

A minimum of one course in written communications chosen from the following:

ENGL 301 Problems in Composition 3
ENGL 302 Advanced Composition 3
ENGL 312 Written Communications in Business 3
ENGL 410 Technical Writing 3

A minimum of one course in oral communications chosen from the following:

COMM 200 Introduction to Human Communication Systems 3
COMM 255 Fundamentals of Communication 3
COMM 312 Oral Communication in Business 3
COMM 350 Public Speaking 3
COMM 356 Small Group Communication 3

Within the college

Thirty additional credits from any of the following departments: 30

Food and Resource Economics, Agricultural Engineering, Agriculture, Animal Science and Agricultural Biochemistry, Entomology and Applied Ecology, or Plant and Soil Sciences. (Fifteen of the 30 credits must be in agriculture courses specifically required by other majors in the college.)

A maximum of twelve credits of Special Problem/Independent Study credits in all areas may be counted toward the degree, with a maximum of six credits in any one department.

Electives

56-59

May include Military Science, Music, or Physical Education (Only four credits of activity-type Physical Education and/or four credits of performing Music organization credit may be counted toward the degree).

CREDITS TO TOTAL A MINIMUM OF: 130

PREVETERINARY INSTRUCTION

Students in the College of Agricultural Sciences who desire to prepare for entrance to a veterinary school should consult with the Chair of the Department of Animal and Food Sciences. See curriculum in department listing.

THE ASSOCIATE IN SCIENCE DEGREE

A two-year Associate in Science (A.S.) degree is offered by the College of Agricultural Sciences. This degree is ideal for students interested in agriculture who desire to spend only two years working toward a degree or who are unsure of their plans for higher education. Admission requirements for the associate degree are the same as those for the baccalaureate degree.

The Associate in Science as offered by the College of Agricultural Sciences provides a student the opportunity to follow an extremely flexible curriculum. The basic requirements are that the student must complete a minimum of 62 credit hours, with at least 30 of the credits earned within at least four of the six departments in the college. A minimum of 32 credits for the degree must be earned at the University of Delaware. In addition, to obtain the degree the recipient must spend at least four of the six academic terms in which all requirements for the degree are to be completed and must, at the time of application, be enrolled in the college. Later application requires the approval of the student’s dean.

Although not necessarily recommended, a student could take all 62 credits in agricultural courses. A better approach would be for the student to take some course work in the areas of physical science, social science, English, and mathematics, along with his or her courses in agriculture. This approach would allow 30 credits to more easily complete a B.S. degree program at a later date if desired.

The flexibility of the curriculum allows students to select only those courses that they and their academic advisor deem most important to their career objectives and to complete a program in two years. For example, it would allow students with an interest in horticulture careers to enroll in predominantly plant science and/or horticulture courses to build a program geared to their specific needs. Animal science, agribusiness, entomology, and agricultural engineering technology are all potential areas in addition to plant science.

For those students in Kent and Sussex Counties, the first year could be taken in Dover or Georgetown in the University Parallel Program at the Delaware Technical & Community College. This option would require careful planning, since 30 credits of agricultural courses would be needed in the second year at the College of Agricultural Sciences in Newark.

There is no special application form for the associate degree program. Students would make application as if they were planning to work toward a B.S. degree in General Agriculture. Then, upon arriving on campus they would inform the college advisor that they plan to work toward an associate degree.

OTHER COLLEGE RESOURCES

Cooperative Extension System. The Delaware Cooperative Extension System is part of a nationwide system whose mission is to enable people to improve their lives and communities by developing
learning partnerships that put knowledge to work. It serves as an educational resource to the people of Delaware for extending research results and advances in technology.

A major thrust of the Cooperative Extension system is to target programs to address critical national issues. The accelerating expansion of technology, the deteriorating economic situation in portions of the agricultural sector, and the dynamic social conditions faced by many Americans, rural and metropolitan, require the Extension to reassess priorities and continuously adapt programs and activities to meet human needs.

Undergraduate students find opportunities to work with Extension specialists to gain practical experience in dealing with the public and in providing information to the public on a wide variety of agriculturally related topics.

Agricultural Experiment Station. The Experiment Station serves as the college's research arm, conducting research, fundamental and applied, in all phases of agriculture and rural life. By performing this function, it not only contributes to increased and efficient production and to improved marketing of agricultural products, but it serves to stabilize production by developing practices and techniques designed to protect crops and livestock against diseases, pests, and certain physical forces of nature. A majority of the professors in the College of Agricultural Sciences have appointments in the Experiment Station.

Students find many opportunities to work with these professors in independent study projects that introduce them to biological, economic, and engineering technology research in the agricultural disciplines. Advanced undergraduates often gain valuable experience working for a professor in a laboratory or in the field on Experiment Station-sponsored research.