The agricultural sciences blend business, science and technology to solve problems related to environmental protection; food and fiber production; and animal and plant health. Comprising nearly 25% of the nation’s workforce, the agricultural sciences provide career opportunities in research, industry, education and government.

The curricula in the College of Agricultural Sciences 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 in agriculture. Frequent consultation with a faculty adviser helps the student make steady progress toward achieving these educational goals.

Majors are offered in food and agribusiness management, agricultural economics, agricultural education, bioresources engineering technology, animal science, engineering technology, natural resource management, entomology, environmental soil science, food science, entomology/plant pathology, plant science, landscape horticulture, plant biology, and general agriculture. Concentrations are available in wildlife conservation, general entomology, preveterinary medicine, agricultural biotechnology, applied animal science, general animal science, production and management, resource economics and rural development, and food marketing. Students interested in engineering technology or general agriculture may complete their degree requirements on the Newark campus or through the Parallel Program at Dover or Georgetown.

College faculty foster student involvement in the University Honors Program through sponsorship of Science and Engineering Scholars and candidates for the Degree with Distinction. The teaching philosophy of the faculty is to emphasize basic knowledge pertaining to agricultural sciences.

DEAN’S SCHOLAR PROGRAM

Each year, the College of Agricultural Sciences allows 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 can be found in educational administrative positions, production agriculture, the Cooperative Extension Service, the Natural Resources Conservation Service, and various leadership positions in agricultural organizations and agencies. Those who continue agricultural education studies through graduate school may go into college teaching, research, or government.

The curriculum in agricultural education is arranged individually with the liaison professor in agricultural education. Selected information in the section of this catalog on the College of Human Resources, Education and Public Policy may be helpful to the agricultural education major.

DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE

MAJOR: AGRICULTURAL EDUCATION

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 (with minimum grade of C)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>multicultural, ethnic, and/or gender-related content (see p 20)</td>
<td>3</td>
</tr>
</tbody>
</table>
COLLEGE REQUIREMENTS

Mathematics and Computer Science
Mathematics course ........................................ 3
Computer Science course (REC 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: Animal & Food Sciences, Bioreresources Engineering, Food and Resource Economics, 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
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 2.5 minimum overall 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. 155) 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 from at least three departments in the college.

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

ELECTIVES
Electives
32-35

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

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 nutrition 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: pre-veterinary 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 pre-veterinary training required for admission to veterinary school.

The pre-veterinary 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. 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, package product interaction, and food chemistry; (2) biotechnology, fermentations, 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.

DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE

MAJOR: ANIMAL SCIENCE

CONCENTRATION: GENERAL ANIMAL SCIENCE

CURRICULUM

CREDITS

UNIVERSITY REQUIREMENTS

UNIVERSITY REQUIREMENTS

English
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 (MATH 115 or higher level) .......................................................... 3
Computer Science course (REC 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, Food Science, Bioreresources Engineering, 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...

Physical Sciences
Minimum of 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 General Chemistry ............................. 4
CHEM 102 General Chemistry .............................. 4
CHEM 103 General Chemistry ............................. 4
CHEM 104 General Chemistry .............................. 4

Within the Department
ANSC 101 Introduction to Animal Science ............... 3
ANSC 111 Animal Science Laboratory .................. 1
ANSC 140 Functional Anatomy ........................... 4
ANSC 251 Livestock Nutrition and Feeding ............ 3
ANSC 300 Principles of Animal and Plant Genetics .... 3

ANIMAL AND FOOD SCIENCES • AGRICULTURAL EDUCATION
ANSC 332 Introduction to Animal Diseases
ANSC 345 Comparative Physiology of Domestic Animals
ANSC 465 Seminar

One course must be selected from the following:
ANSC 404 Dairy Production
ANSC 417 Beef Cattle and Sheep Production
ANSC 418 Swine Production
ANSC 421 Poultry Production

Animal Science courses

No more than five credits of ANSC 266, 267, 366, or 466 Special Problem/Independent Study may be used for the major.

Credit toward the major will be granted for only two of the following:
ANSC 221, 322, 342, or 420

**ELECTIVES**

**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.) ANSC 399 may be taken one time for a maximum of 2 credits toward graduation

**Recommended Electives**

FREC 201 Records and Accounts
ANSC 270 Biotechnology: Science and Socioeconomic Issues
ANSC 399 Teaching Assistant
ANSC 420 Equine Management
BISC 371 Introduction to Microbiology
COMM 350 Public Speaking
ENGL 312 Written Communications in Business

**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 310 Animal Genetics Laboratory
BISC 371 Introduction to Microbiology
CHEM 321 Organic Chemistry
CHEM 322 Organic Chemistry
CHEM 527 Introductory Biochemistry
CHEM 641/642 Biochemistry
MATH 221 Calculus
PHYS 201 Introductory Physics I

**ELECTIVES**

**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.) ANSC 399 may be taken one time for a maximum of 2 credits toward graduation

**Recommended Electives**

FREC 201 Records and Accounts
ANSC 270 Biotechnology: Science and Socioeconomic Issues
ANSC 399 Teaching Assistant
ANSC 420 Equine Management
BISC 371 Introduction to Microbiology
COMM 350 Public Speaking
ENGL 312 Written Communications in Business

**CREDITS TO TOTAL A MINIMUM OF** 130

**DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE MAJOR: ANIMAL SCIENCE**

**CONCENTRATION: APPLIED ANIMAL SCIENCE**

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
BISC 371 Introduction to Microbiology
CHEM 321 Organic Chemistry
CHEM 322 Organic Chemistry
CHEM 527 Introductory Biochemistry
CHEM 418 Introductory Physical Chemistry
COMM 350 Public Speaking
ENGL 312 Written Communications in Business

**ELECTIVES**

**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.) ANSC 399 may be taken one time for a maximum of 2 credits toward graduation

**Recommended Electives**

ANSC 399 Teaching Assistant
ANSC 411 Infection and Immunity in Animal Diseases
ANSC 624 Monogastic Nutrition
ANSC 633 Poultry Pathology
ANSC 635 Introduction to Virology
ANSC 643 Molecular Endocrinology
ANSC 645 Avian Physiology
ANSC 654 Ruminant Nutrition
BISC 301 Immunology
BISC 302 Molecular Biology of the Cell
BISC 527 Introductory Biochemistry
BISC 653 Recent Advances in Molecular Biology
BISC 654 Biochemical Genetics
BISC 655 Developmental Genetics
BISC 671 Immunobiology
BISC 679 Virology
BISC 693 Human Genetics
CHEM 201 Quantitative Analysis
CHEM 418 Introductory Physical Chemistry
COMM 350 Public Speaking
ENGL 312 Written Communications in Business
FOSC 439/639 Food Microbiology
FOSC 449/649 Fermentation Technology

**CREDITS TO TOTAL A MINIMUM OF** 130
**RECOMMENDED ELECTIVES**

- ANSC 270 Biotechnology: Science and Socioeconomic Issues
- ANSC 399 Teaching Assistant
- ANSC 420 Equine Management
- ANSC 431 Infection and Immunity in Animal Diseases
- BISC 371 Introduction to Microbiology
- COMM 312 Oral Communication in Business
- ENGL 312 Written Communication in Business
- EGTE 328 Agricultural Waste Management Systems
- FREC 153 Agricultural Salesmanship
- FREC 350 Farm Management
- PISC 401 Agronomic Crop Science

**CREDITS TO TOTAL A MINIMUM OF** 130

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**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; 332; one course from ANSC 201, 431, or 441; and one course from ANSC 404, 417, 418, 420, and 421.

**DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE**

**MAJOR: FOOD SCIENCE**

**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).

**COLLEGE REQUIREMENTS**

**Mathematics and Computer Science**

- Mathematics course 3
- Computer Science course (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, Bioresources 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

**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 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 Organic Chemistry 4
- CHEM 220 Quantitative Analysis I 3
- CHEM 221 Quantitative Analysis Laboratory 1
- PHYS 201 Introductory Physics I 4
- PHYS 202 Introductory Physics II 4
- BISC 207 Introductory Biology I 4
- BISC 208 Introductory Biology II 4
- BISC 371 Introduction to Microbiology 4
- CHEM 321 Organic Chemistry 4
- CHEM 322 Organic Chemistry 4
- CHEM 416 Introductory Physical Chemistry 3
- CHEM 419 Introductory Physical Chemistry 3
- CHEM 527 Introductory Biochemistry 3
- CHEM 445 Physical Chemistry Laboratory 1
- ECON 151 Introduction to Microeconomics: Prices and Markets 3
- PSYC 201 General Psychology 3
- MATH 221 Calculus I 3
- MATH 224 Analytic Geometry and Calculus A 4
- MATH 222 Calculus II 3
- MATH 224 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 FSC; 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 460) may count toward the fulfillment of this requirement.

**MINOR IN FOOD SCIENCE**

The minor in food science requires 15 food science credits and provides students in other degree programs with an opportunity to acquaint themselves with food science. Course selection depends 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 is 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 and 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

- FOSC 359 Topics in Food Science 3
- 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**

- 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.) FOSC 399, Teaching Assistant, may be taken one time allowing a maximum of 2 credits toward graduation.

**CREDITS TO TOTAL A MINIMUM OF** 132
## BIORESOURCES ENGINEERING

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

Bioresources 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 bioresources engineering technology curriculum is designed to prepare students for engineering-related employment in agricultural, natural resources, and environmental 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 bioresources engineering technology, students must attain a 2.0 average in bioresources 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 bioresources engineering technology curriculum. Students are urged to purchase a personal computer. Please contact the department chair for further information on computer specifications.

### DEGREE: BACHELOR OF APPLIED SCIENCE

#### MAJOR: BIORESOURCES ENGINEERING TECHNOLOGY

<table>
<thead>
<tr>
<th>CURRICULUM</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIVERSITY REQUIREMENTS</td>
<td></td>
</tr>
<tr>
<td>ENGL 110 Critical Reading and Writing (with 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>
</tr>
<tr>
<td>COLLEGE REQUIREMENTS</td>
<td></td>
</tr>
<tr>
<td>Communications</td>
<td>7</td>
</tr>
<tr>
<td>A second writing course selected from the following:</td>
<td></td>
</tr>
<tr>
<td>ENGL 301 Expository Writing</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 302 Advanced Exposition</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 307 News Writing and Editing</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 312 Written Communications in Business</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 410 Technical Writing</td>
<td>3</td>
</tr>
<tr>
<td>An oral communications course selected from the following:</td>
<td></td>
</tr>
<tr>
<td>AGRI 212 Oral Communications in Agriculture and Natural Resources</td>
<td>3</td>
</tr>
<tr>
<td>COMM 200 Introduction to Human Communication Systems</td>
<td>3</td>
</tr>
<tr>
<td>COMM 255 Fundamentals of Communication</td>
<td>3</td>
</tr>
<tr>
<td>COMM 312 Oral Communication in Business</td>
<td>3</td>
</tr>
<tr>
<td>COMM 350 Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>COMM 356 Small Group Communication</td>
<td>3</td>
</tr>
<tr>
<td>Social Sciences and Humanities</td>
<td>15</td>
</tr>
<tr>
<td>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:</td>
<td></td>
</tr>
<tr>
<td>ECON 151 Introduction to Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>ECON 152 Introduction to Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>The remaining 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</td>
<td></td>
</tr>
<tr>
<td>Basic Sciences and Mathematics</td>
<td>35</td>
</tr>
<tr>
<td>A minimum of 35 credits selected to provide fundamental knowledge about nature and its phenomena Specific requirements are:</td>
<td></td>
</tr>
</tbody>
</table>

### MAJOR REQUIREMENTS

#### Technical Sciences

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

<table>
<thead>
<tr>
<th>Credit</th>
<th>Specific requirements are:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>EGTE 218 Fundamentals of Hydraulic Systems</td>
</tr>
<tr>
<td>4</td>
<td>EGTE 244 Electricity for Engineering Technology</td>
</tr>
<tr>
<td>4</td>
<td>EGTE 311 Fundamentals of Thermodynamics</td>
</tr>
<tr>
<td>4</td>
<td>EGTE 354 Rural/Light Industrial Buildings</td>
</tr>
</tbody>
</table>

The remaining three credits must be selected from one of the following areas: Dynamics, Electronics, Materials Technology, or Strength of Materials. EGTE courses that satisfy this requirement are:

<table>
<thead>
<tr>
<th>Credit</th>
<th>EGTE 344 Electronics and Microprocessors</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>EGTE 435 Machinery Design and Development</td>
</tr>
</tbody>
</table>

#### Technical Skills

Twelve credits selected from courses that involve technical analysis and design

<table>
<thead>
<tr>
<th>Credit</th>
<th>Specific requirements are:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>EGTE 321 Storm-Water Management</td>
</tr>
<tr>
<td>3</td>
<td>EGTE 32B Waste Management Systems</td>
</tr>
<tr>
<td>3</td>
<td>EGTE 421 Bioresources Management Systems</td>
</tr>
<tr>
<td>3</td>
<td>EGTE 431 Mechanical Aspects of Biological and Natural Resources</td>
</tr>
<tr>
<td>3</td>
<td>EGTE 451 Senior Design</td>
</tr>
</tbody>
</table>

#### Technical Specialization

Twenty-one credits selected from courses that involve technical analysis and design

<table>
<thead>
<tr>
<th>Credit</th>
<th>and one of the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>BREG 52B Land Application of Wastes</td>
</tr>
<tr>
<td>3</td>
<td>EGTE 331 Mechanical Power Units</td>
</tr>
<tr>
<td>3</td>
<td>EGTE 440 Plant Layout and Materials Handling</td>
</tr>
<tr>
<td>3</td>
<td>EGTE 444 Programmable Logic Control Systems</td>
</tr>
<tr>
<td>3</td>
<td>EGTE 445 Food Engineering Technology</td>
</tr>
<tr>
<td>3</td>
<td>EGTE 456 Fundamentals of HVAC</td>
</tr>
</tbody>
</table>

#### Technical Support

Eighteen credits selected to support the specialization and career interests of the student

<table>
<thead>
<tr>
<th>Credit</th>
<th>Specific Requirements:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>PLSC 204 Introduction to Soil Science</td>
</tr>
</tbody>
</table>

A minimum of three credits in biology/life sciences or natural resources, excluding courses used to satisfy the Biology, Chemistry, and Physics group

The remaining credits may be satisfied by additional courses in the Bioresources Engineering Department or related courses approved by the student's advisor

To graduate with a major in Bioresources Engineering Technology, the students must attain an average 2.0 index in all courses with a BREG or EGTE prefix.
ELECTIVES

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 in utilization of materials and forces. Engineering technology requires the application of scientific and engineering knowledge combined with technical skills in support of engineering activities. The 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.

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 industry, consulting firms, construction companies, and 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 or they may transfer previously completed appropriate course work from other accredited institutions. 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

CREDITS

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

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

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 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

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:

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, Women's Studies

Basic Sciences and Mathematics

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 I ............................................ 3
or

PHYS 207 Fundamentals of Physics I ...................................... 3
or

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

MATH 241 Analytic Geometry and Calculus A ............................ 4
or

MATH 222 Calculus II ....................................................... 3
or

MATH 242 Analytic Geometry and Calculus B ............................ 4

STAT 201 Introduction to Statistics I ...................................... 3
or

STAT 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

Fifteen credits that deal with the application of engineering science subject matter.

Specific requirements are:

EGTE 218 Fundamentals of Hydraulic Systems .......................... 3
EGTE 244 Electricity for Engineering Technology ...................... 4
EGTE 311 Fundamentals for Thermodynamics ........................... 3
EGTE 454 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

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
A minimum of fifteen semester credits selected from courses that involve technical design and electives. At least one course (this 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 331 Mechanical Power Units 4
EGTE 435 Machinery Design and Development 4
EGTE 456 Fundamentals of HVAC 3

Four of the following courses must be selected:

EGTE 321 Storm Water Management 4
EGTE 331 Mechanical Power Units 4
EGTE 344 Electronics and Microprocessors 3
EGTE 435 Machinery Design and Development 3
EGTE 440 Plant and Materials Handling 3
EGTE 443 Instrumentation 3
EGTE 444 Programmable Logic Control Systems 3
EGTE 445 Food Engineering Technology 4
EGTE 456 Fundamentals of HVAC 3

**Technical Support**

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

**ELECTIVES**

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

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**CONCENTRATION: TECHNICAL MANAGEMENT**

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

**Technical Skills**

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 methods, 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 specialization. A maximum of six hours of drafting and one course in computer-aided drafting can be applied towards degree requirements. Also a maximum of eight hours of surveying and topographic mapping and a maximum of six hours of construction, operation, and production techniques can be applied to degree requirements. For transfer students, after matriculation in the program, course work will normally be limited to instrumentation and computer use.

**Technical Specialization**

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 331 Mechanical Power Unit 4

EGTE 435 Machinery Design and Development 3
EGTE 456 Fundamentals of HVAC 3

**Technical Management**

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:

FREC 201 Records and Accounts 3
or
ACCT 207 Accounting 3

Accounting credits cannot exceed six of the fifteen credit hours. FREC 201 will not substitute for ACCT 207, ACCT 207 will substitute for FREC 201. It is recommended that ACCT 207 and ACCT 208 be taken. Other courses can be selected from certain courses in Business Administration, Engineering Technology or Food and Resource Economics.

**Electives**

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

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**REQUIREMENTS FOR A MINOR IN ENGINEERING TECHNOLOGY**

A minor in engineering technology may be earned by a student in any University bachelor degree program through successful completion of a minimum of 20 credits of engineering technology courses in accordance with the requirements listed here. All students must meet the required prerequisites for any engineering technology course before it is taken. Before being admitted to the minor, the student must have successfully completed MATH 222 or MATH 242, CHEM 102 or CHEM 104, and PHYS 202 or PHYS 208. A grade point average of at least 2.0 is required in the 20 credits of engineering technology courses for the minor and in the mathematics and science courses listed below.

The required engineering technology courses are:

EGTE 109 Technical Drafting 2
EGTE 111 Computer Applications in Engineering Technology 3

An additional 15 credits in engineering technology must be taken of which at least 6 credits must be at the 300-level or higher. All engineering technology courses shall be selected with the approval of an advisor in the Department of Bioresources Engineering to meet each student's objectives. For students concerned with the environment, these courses might include EGTE 103, 113, and 328; for those interested in electronics, EGTE 244 and 344. Courses can also be chosen to give the student's minor an emphasis in other areas such as manufacturing, mechanics, or technical management.

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**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 on insects in the General Entomology Concentration. This program requires basic sciences as well as specialty courses on insects. Some flexibility in course selection 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**

**CURRICULUM**

**CREDITS**

**UNIVERSITY REQUIREMENTS**

ENGL 110  Critical Reading and Writing (with minimum grade of C-)  
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 (MATH 115, 171 or higher level)  
Computer Science course (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 (except FREC 135), Food Science, Bioresources Engineering, Animal Science (except ANSC 300), Plant and Soil Sciences (except PSC 300), 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 minimum grade of C- is required for all ENTO credits used to satisfy departmental requirements. Except as noted, a course may be applied toward both a major requirement and a college requirement

External to the College

BISC 207  Introductory Biology I  
BISC 208  Introductory Biology II  
BISC 302  General Ecology  
CHEM 101/102 General Chemistry  
CHEM 103/104 General Chemistry

Within the Department

ENTO 205  Elements of Entomology  
ENTO 305  Entomology Laboratory  
ENTO 406  Insect Identification—Taxonomy  
ENTO 465  Seminar

Within the Concentration

ENTO 300  Principles of Animal and Plant Genetics  
ENTO 405  Insect Structure and Function  
ENTO 409  Field Taxonomy  
ENTO courses (may include credits of minimum of Independent Study, Research, and Field Experience)

Nine credits from the following:

BISC XXX  Any biology course at or above 300 level

PLSC 151  Introduction to Crop Science
PLSC 201  Botany II
PLSC 204  Introduction to Soil Science
PLSC 211  Herbaceous Landscape Plants
PLSC 212  Woody Landscape Plants
PLSC 303  Introductory Plant Pathology
PLSC 402  Plant Taxonomy

**ELECTIVES**

**CREDITS**

**UNIVERSITY REQUIREMENTS**

ENGL 110  Critical Reading and Writing (with minimum grade of C-)  
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 (MATH 115, 171 or higher level)  
Computer Science course (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 (except FREC 135), Food Science, Agricultural Engineering, Animal Science (except ANSC 300), Plant and Soil Sciences (except PSC 300), 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 minimum grade of C- is required for all ENTO credits used to satisfy departmental requirements. Except as noted, a course may be applied toward both a major requirement and a college requirement

External to the College

BISC 207  Introductory Biology I  
BISC 208  Introductory Biology II  
BISC 302  General Ecology  
CHEM 101/102 General Chemistry  
CHEM 103/104 General Chemistry

Within the Department

ENTO 205  Elements of Entomology  
ENTO 305  Entomology Laboratory  
ENTO 406  Insect Identification—Taxonomy  
ENTO 465  Seminar

Within the Concentration

ENTO 201  Wildlife Conservation and Ecology  
ENTO 325  Wildlife Management  
ENTO 318  Taxonomy of Birds  
ENTO 418  Avian Biology  
ENTO 425  Mammalogy  
ENTO courses (may include credits of Independent Study, Research, and Field Experience)

GROUP I: 7-8 credits from the following (or higher levels of CHEM and PHYS):

CHEM 213  Elementary Organic Chemistry  
CHEM 214  Elementary Biochemistry  
CHEM 216  Elementary Biochemistry Laboratory  
GEOG 203  Physical Geography: Topography—Soils  
GEOL 107  General Geology  
PHYS 201  Introductory Physics I  
PHYS 202  Introductory Physics II  
PLSC 303  Introductory Plant Pathology

GROUP II: 7-8 credits from the following:

ANSC 140  Functional Anatomy of Domestic Animals  
BISC 301  Molecular Biology of the Cell
ENTOMOLOGY AND APPLIED ECOLOGY • COLLEGE OF AGRICULTURAL SCIENCES

BISC 303 Genetic and Evolutionary Biology ................................................. 4
BISC 305 Cell Physiology ........................................................................... 4
BISC 306 General Physiology ..................................................................... 4
BISC 312 General Biology Lab ................................................................. 1
BISC 324 Invertebrate Zoology ................................................................. 4
BISC 371 Introduction to Microbiology ..................................................... 4
BISC 442 Vertebrate Morphology .............................................................. 4
BISC 495 Evolution .................................................................................... 3
BISC 480 Vertebrate Natural History ......................................................... 4
BISC 637 Population Ecology ................................................................. 3
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: 7-8 credits from the following:
PLSC 101 Botany I .................................................................................... 4
PLSC 201 Botany II ................................................................................... 4
PLSC 212 Woody Landscape Plants ......................................................... 4
PLSC 300 Principles of Animal and Plant Genetics .................................. 3
PLSC 306 Plant Molecular Biology .......................................................... 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
PLSC 420 Plant Physiology Laboratory .................................................... 2

GROUP IV: 6 credits from the following:
Only 3 credits may count toward the College Literature and Arts Group Requirement:
AGRI 212 Oral Communication in Agriculture and Natural Resources 3
COMM 255 Fundamentals of Communication ....................................... 3
COMM 312 Oral Communication in Business ....................................... 3
COMM 350 Public Speaking ..................................................................... 3
ENGL 312 Written Communications in Business .................................. 3
ENGL 410 Technical Writing .................................................................... 3

GROUP V: 6 credits from the following or higher levels in addition to college math and computer requirements:
EGTE 111 Computer Applications in Engineering Technology .......... 3
or
CISC 105 General Computer Science .................................................... 3
or
GEOG 250 Computer Methods in Geography ....................................... 4
FREC 408 Research Methods I ............................................................... 4
FREC 409 Research Methods II .............................................................. 4
FREC 480 Geographic Information Systems in Natural Resources Management 4
MATH 221 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:
ECON 151 Introduction to Microeconomics: Prices and Markets ........ 3
or
FREC 150 Economics of Agriculture and Natural Resources ............ 3
(Either of two previous courses is prerequisite to FREC 424, 444)
FREC 424 Resource Economics ............................................................ 3
FREC 444 Economics of Environmental Management ....................... 3
FREC 450 Topics in Environmental Law ............................................... 3
GEOG 235 Conservation of Natural Resources .................................... 3
GEOG 236 Conservation: Global Issues ................................................. 3
PHIL 340 Cross-cultural Environmental Ethics ..................................... 3
PHIL 448 Environmental Ethics ............................................................. 3
POSC 105 The American Public System ................................................. 3
POSC 220 Introduction to Public Policy .................................................. 3
POSC 350 Politics and the Environment ............................................... 3
SOC 210 Population Problems ............................................................... 3

ELECTIVES

Electives ................................................................................................. 6-26

Number of elective credits depends on number of courses chosen for concentration groups that satisfy college requirements. (Only two credits of activity-type Physical Education and performing Music organization may be counted toward the degree)

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

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 minor. Credits for Special Problem, Independent Study, Research, and Field Experience do not count toward the minor.

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 agriculture and the environment.

DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE

MAJOR: ENTOMOLOGY/PLANT PATHOLOGY

CURRICULUM

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)

COLLEGE REQUIREMENTS

Mathematics and Computer Science
Mathematics course (MATH 115 or higher level) .................................................. 3
Computer Science course (FREC 135, or equivalent) ........................................ 3

Agricultural and Biological Sciences
Minimum of one course outside the student's major in one of the following areas: Food and Resource Economics (except FREC 135), Food Science, Bioresources 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.

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

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

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

47
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 businesses, 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

COLLEGE REQUIREMENTS

Mathematics and Computer Science
Mathematics course (MATH 115 or higher level; MATH 221, MATH 230, and STAT 201 are strongly recommended) 3

ELECTIVES

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

CREDITS TO TOTAL A MINIMUM OF 128


MAJOR REQUIREMENTS

External to the College

ACCT 207 Accounting I 3
ACCT 208 Accounting II 3
COMM 312 Oral Communication in Business 3
ENG 312 Written Communications in Business 3
ECON 101 Introduction to Microeconomics: Prices and Markets 3
ECON 152 Introduction to Macroeconomics: National Economy 3
BUS 301 Introduction to Marketing 3
Two additional courses offered by the College of Business and Economics at the 300 or 400 level 6
One foreign language course 4

Within the Department

FREC 110 Introduction to Food and Agribusiness Industry 1
FREC 135 Introduction to Data Analysis 3
FREC 150 Economics of Agriculture and Natural Resources 3
FREC 240 Quantitative Methods in Agricultural Economics 3
FREC 345 Strategic Selling and Buyer Communication 3
FREC 404 Food and Fiber Marketing 3
FREC 405 Management and Leadership Development 3
FREC 408 Research Methods I 3
FREC 409 Research Methods II 3
FREC 410 International Agricultural Trade and Marketing 3
FREC 430 Developing and Managing a Food and Agribusiness Enterprise 3

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. MATH 221 or higher (with a minimum grade of C+) can be used as a substitute course for MATH 115 and FREC 240

ELECTIVES

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 3
FREC 325 Advanced Data Management 3
FREC 427 Agribusiness Financial Management 3
FREC 471 Futures and Options Markets 3
FREC 464 Agribusiness Internship 3

Suggested Resource Management Electives:
FREC 406 Agriculture and Natural Resource Policy 3
FREC 424 Resource Economics 3
FREC 429 Community Economic Development 3
FREC 444 Economics of Environmental Management 3
FREC 480 Geographic Information Systems in Natural Resource Management 3

Suggested Communications and Writing Electives:
ENG 301 Expository Writing 3

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
- FREC 335 Advanced Data Management
- FREC 427 Agribusiness Financial Management
- FREC 471 Futures and Options Markets

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 Scheduling and Buyer Communication
- FREC 404 Food and Fiber Marketing
- FREC 405 Management and Leadership Development
- FREC 471 Futures and Options Markets

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

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

DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE
MAJOR: AGRICULTURAL ECONOMICS

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)

COLLEGE REQUIREMENTS

Mathematics and Computer Science

- Mathematics course (MATH 115 or higher level; MATH 221, MATH 230, and STAT 201 are strongly recommended) ........................................ 3
  - Computer Science course (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, 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

- 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 two-course sequences:
    - SCEN 101 and 102
    - GEOL 105 and 106

- ENGL 110 Critical Reading and Writing (with a minimum grade of C) ...... 3

ECON 151 Introduction to Microeconomics: Prices and Markets

- ECON 152 Introduction to Macroeconomics: National Economy
- ECON 302 Banking and Monetary Policy
- ECON 300 Intermediate Microeconomic Theory
- ECON 303 Intermediate Macroeconomic Theory

Two additional courses offered by the College of Business and Economics and Economics at the 300-level or higher.

Students can qualify for a minor in Economics if they take an additional 400-level Economics course and obtain a grade of C- or better in all Economics courses (see “The Minor in Economics” in the College of Business and Economics curriculum).

Within the Department

- FREC 125 Elementary Agricultural Economics: Applications
- FREC 135 Introduction to Data Analysis
- FREC 150 Economics of Agriculture and Natural Resources
- FREC 201 Records and Accounts
- FREC 240 Quantitative Methods in Agricultural Economics
- FREC 465 Seminar

Seven courses at the 400-level or above with at least two in each of the following general areas:

1. Marketing/International Trade

   - FREC 404 Food and Fiber Marketing
   - FREC 410 International Agricultural Trade and Marketing
   - FREC 471 Futures and Options Markets

2. Production/Management

   - FREC 403 Production Economics
   - FREC 427 Agribusiness Financial Management
   - FREC 420 Agriculture in Economic Development

3. Resources/Development

   - FREC 429 Community Economic Development
   - FREC 444 Economics of Environmental Management
   - FREC 405, FREC 435, FREC 650, 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.

ELECTIVES

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)

CREDITS TO TOTAL A MINIMUM OF ................................................................. 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 Farm Management
- FREC 355 Production in Economics

Agricultural Economics [FREC] courses required for the Agricultural Economics major may be used to satisfy requirements for the Production and Management concentration.

In addition to the Business and Economics courses required for the Agricultural Economics major, the following courses must be taken:

- BUAD 301 Management and Organizational Behavior
- BUAD 382 International Business Management
- ECON 415 Economic Forecasting
- STAT 201 Introduction to Statistics I
- STAT 202 Introduction to Statistics II

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 444 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 308 Economic Theory of Politics .................................................. 3
   - ECON 408 Economics of Law .................................................. 3
   - ECON 411 Economics of Growth and Development .................................... 3

2. Quantitative Methods
   - ECON 415 Econometric Forecasting .................................................. 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 A 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 can major in Plant Science, Landscape Horticulture, Plant Biology or Environmental Soil Science. The department also co-offers Natural Resource Management, an interdisciplinary major.

DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE
MAJOR: ENVIRONMENTAL SOIL SCIENCE

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) .................................................. 3

COLLEGE REQUIREMENTS

Mathematics and Computer Science

- Mathematics course .................................................. 3
- Computer Science course (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, Bioresources Engineering, Animal Science, Food Science, Entomology and Applied Ecology, or Biology. 9-12
- 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 areas: Chemistry, Physics, Geology, or Physical Science. 8

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.

Within the College

- CHEM 101 General Chemistry .................................................. 4
- CHEM 102 General Chemistry .................................................. 4
- CHEM 103 General Chemistry .................................................. 4
- CHEM 104 General Chemistry .................................................. 4
- CHEM 213 Organic Chemistry .................................................. 4
- CHEM 220 Quantitative Analysis .................................................. 3
- CHEM 221 Quantitative Analysis Laboratory ........................................ 1
- ENGL 410 Technical Writing .................................................. 3
- GEOG 107 General Geology I .................................................. 4
- MATH 221 Calculus I .................................................. 3
- PHYS 101 Introduction to Physics .................................................. 1

Within the Department

- EGT 103 Land and Water Management .............................................. 2
- EGT 113 Land Surveying .................................................. 3
- EGT 328 Agricultural Waste Management .............................................. 3
- PLSC 150 Economics of Agriculture and Natural Resources ...................... 3

ELECTIVES

- May include the following suggested courses or other electives
  - BISC 321 Environmental Biology .................................................. 3
  - FREC 135 Introduction to Data Analysis ............................................ 3
  - FREC 144 Economics of Environmental Management .................................. 3
  - GEOL 235 Conservation of Natural Resources ..................................... 3
  - GEOL 415 General Geomorphology .................................................. 3
  - GEOL 428 Hydrogeology .................................................. 3
  - GEOL 421 Environmental and Applied Geology .................................... 3
  - PLSC 508 Soil Physics .................................................. 3
  - POSC 350 Politics and the Environment .................................................. 3

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

DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE
MAJOR: LANDSCAPE HORTICULTURE

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) .................................................. 3

COLLEGE REQUIREMENTS

Mathematics and Computer Science

- Mathematics course .................................................. 3
- Computer Science course (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, Food Science, Agricultural Engineering, Animal Science, Entomology and Applied Ecology, or Biology. 9-12

CREDITS TO TOTAL A MINIMUM OF .............................................. 124
PLANT AND SOIL SCIENCES • COLLEGE OF AGRICULTURAL SCIENCES

DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE

MAJOR: PLANT BIOLOGY

CURRICULUM

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 (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, Food Science, Biotechnology Engineering, Animal Science, Entomology and Applied Ecology, 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 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

External to the College ....................................................................................................... 18
CHEM 101 General Chemistry ............................................................................................ 4
or
CHEM 103 General Chemistry ............................................................................................ 4
CHEM 102 General Chemistry ............................................................................................ 4
or
CHEM 104 General Chemistry ............................................................................................ 4
CHEM 213 Organic Chemistry ............................................................................................ 4
One of the following Communication courses: ................................................................. 3
AGRI 212 Oral Communication in Agricultural Sciences ............................................... 3
COMM 312 Oral Communication in Business ................................................................ 3
COMM 332 Public Speaking .............................................................................................. 3
ENGL 312 Written Communication in Business ............................................................. 3
ENGL 410 Technical Writing ............................................................................................. 3
One business-related course chosen from the following: ................................................ 3
ACCT 207 Accounting ....................................................................................................... 3
ACCT 352 Law and Social Issues in Business .................................................................... 3
CNST 200 Consumer Economics ..................................................................................... 3
CNST 242 Consumer Movement in Perspective .............................................................. 3
ECON 151 Introduction to Microeconomics ................................................................. 3
ECON 152 Introduction to Macroeconomics ................................................................. 3
FREC 201 Records and Accounts ...................................................................................... 3
FREC 302 Management of Agribusiness Firms ............................................................... 3
FREC 312 Food Retailing and Product Management .................................................... 3
FREC 404 Food and Fiber Marketing .............................................................................. 3
FREC 406 Agricultural and Natural Resource Policy .................................................... 3
FREC 430 Est. and Managing a Food and Agribusiness Enterprise ............................... 3
PHIL 200 Business Ethics ................................................................................................. 3
PHIL 200 Consumer Economics ..................................................................................... 3
POSC 220 Introduction to Public Policy .......................................................................... 3
POSC 301 State and Local Government ........................................................................ 3

Within the Department/College: ..................................................................................... 62
EGTE 103 Land and Water Management ...................................................................... 3
ENTO 205 Elements of Entomology ............................................................................. 3
FREC 135 Computer Science course (FREC 135, or equivalent) ....................................... 3
CHEM 101 General Chemistry ............................................................................................ 4
or
CHEM 103 General Chemistry ............................................................................................ 4
CHEM 102 General Chemistry ............................................................................................ 4
or
CHEM 104 General Chemistry ............................................................................................ 4
CHEM 213 Organic Chemistry ............................................................................................ 4
One of the following: ........................................................................................................ 3
CHEM 214 and 216 Elementary Biochemistry and Lab ..................................................... 3
CHEM 327 Biochemistry ................................................................................................ 3
CHEM 328 Biochemistry ................................................................................................ 3

ONE OF THE FOLLOWING COMMUNICATION COURSES:

AGRI 212 Oral Communication in Agricultural Sciences ............................................... 3
COMM 312 Oral Communication in Business ................................................................ 3
COMM 332 Public Speaking .............................................................................................. 3
ENGL 312 Written Communication in Business ............................................................. 3
ENGL 410 Technical Writing ............................................................................................. 3

ANOTHER OF THE FOLLOWING:

CHEM 321/322 Organic Chemistry ................................................................................ 8

Electives

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

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

51
### 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.

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

### DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE

#### MAJOR: NATURAL RESOURCE MANAGEMENT

<table>
<thead>
<tr>
<th>CURRICULUM</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIVERSITY REQUIREMENTS</td>
<td></td>
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<tr>
<td>ENGL 110 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>
<td>3</td>
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| COLLEGE REQUIREMENTS | |
| Mathematics and Computer Science | |
| Mathematics course | 3 |
| Computer Science course (PRE 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, Bioscience Engineering, Animal Science, Food Science, Entomology and Applied Ecology, 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 requirements and a college requirement, but credits are counted only once toward graduation | |

| External to the College | |
| CHEM 101 General Chemistry | 4 |
| CHEM 103 General Chemistry | 4 |
| CHEM 104 General Chemistry | 4 |
| CHEM 213 Elementary Organic Chemistry | 4 |
| PHYS 101 Introduction to Physics | 4 |
| GEOL 105 General Geology | 4 |
| CHEM 214 Elementary Biochemistry | 3 |

| Within the Department | |
| PLSC 101 Botany I | 4 |
| PLSC 201 Botany II | 4 |
| PLSC 204 Introduction to Soil Science | 4 |
| PLSC 300 Principles of Animal and Plant Genetics | 3 |
| PLSC 303 Principles of Plant Pathology | 4 |
| PLSC 305 Environmental Soil Management | 4 |
| PLSC 410 Introduction to Plant Physiology | 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 |
GROUP VII: Natural Resource/Environmental Policy: 12 credits from
FREC 406
EGTE 416
ECON 360
FREC 407
GEOG 220 Meteorology
GEOG 206 Physical Geography: Topography-Soils
GEOI 107 General Geology.

GROUP VI: Land and Water Management: 6 credits from the following:
ECON 332
EGTE 328 Waste Management Systems
EGTE 103 Land Surveying
EGTE 118 Land Surveying

GROUP V: Plants and Animals: 6 credits from the following:
PlSC 402 Plant Taxonomy.
ENTO 318 Taxonomy of Birds
ENTO 305 Entomology Laboratory

GROUP IV: Ecosystems: 6 credits from the following:

GROUP III: Statistics: 6 credits from the following:
FREC 408 Research Methods
FREC 409 Research Methods II

GROUP II: Chemistry/Physics: 8 credits from the following:
CHEM 213 Elementary Organic Chemistry
CHEM 214 Elementary Biochemistry
CHEM 216 Elementary Biochemistry - Laboratory

GROUP I: Communications: 6 credits from the following (including a
minimum of three credits in oral communications):
ENGL 312 Written Communications in Business
ENGL 410 Written Communications in Business
COMM 255 Fundamentals of Communication

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

CREDITS TO TOTAL A MINIMUM OF: 130

GENERAL AGRICULTURE

For the student with broad interests, the major in general agriculture is
offered.

DEGREE: BACHELOR OF SCIENCE IN AGRICULTURE
MAJOR: GENERAL AGRICULTURE

CURRICULUM

UNIVERSITY REQUIREMENTS

ENGL 110 Critical Reading and Writing (Minimum grade C) 3
ENGL 110 Critical Reading and Writing (Minimum grade C) 3
ENGL 110 Critical Reading and Writing (Minimum grade C) 3
ENGL 110 Critical Reading and Writing (Minimum grade C) 3

Agricultural and Biological Sciences

Minimum of one course outside the student's major in three of the follow-
ing areas: Food and Resource Economics, Food Science, Bioresources
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

Social Sciences and Humanities

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

Physical Sciences
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
GEOI 105 and 106

External to the college
A minimum of one course in written communications chosen from the following:
ENGL 301 Expository Writing
ENGL 302 Advanced Composition
ENGL 312 Written Communications in Business
ENGL 312 Written Communications in Business

A minimum of one course in oral communications chosen from the following:
COMM 200 Introduction to Human Communication Systems
COMM 255 Fundamentals of Communication
COMM 312 Oral Communication in Business
COMM 320 Public Speaking
COMM 356 Small Group Communication

Within the college
Thirty additional credits from any of the following departments:
Food and Resource Economics, Bioresources Engineering, Agriculture,
Animal Science, Entomology and Applied Ecology, Food Science, or
Plant and Soil Sciences. (Fifteen of the 30 credits must be in agriculture

GENERAL AGRICULTURE • COLLEGE OF AGRICULTURAL SCIENCES
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 for the baccalaureate degree.

The Associate in Science offers an extremely flexible curriculum. The student must complete a minimum of 62 credit hours, with at least 30 of the credits earned within at least four of the five departments in the college. A minimum of 52 credits for the degree must be earned at the University of Delaware. A candidate must apply for the associate degree during the academic term 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 the student 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 objective. 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 bioresources 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.

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.