

College of Agriculture and Natural Resources

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In 1862, Congress passed the Morrill Land Grant Act providing grants of federal land to each state. Funds from the sale of these lands were used in establishing a college teaching agriculture and related subjects in each state. Subsequent federal acts have enlarged the responsibilities of these colleges. Today they continue to serve agriculture and society in many ways through a variety of educational programs. The University of Connecticut is the land-grant university in Connecticut. The College of Agriculture and Natural Resources offers instruction at both undergraduate and graduate levels. Research and experimental work is carried on through the Storrs Agricultural Experiment Station. Educational and service programs are conducted throughout the State by the Cooperative Extension System. The College of Agriculture and Natural Resources is supported by both federal and state appropriations and contributions from the private sector.

The College maintains livestock, greenhouses, forested lands, gardens, orchards, and other related operations to supplement and enhance instruction, research, and service programs. The Northeastern Research Center for Wildlife Diseases, the Center for Environmental Health, the Water Resources Center, and the Food Marketing Policy Center are also integral parts of the College of Agriculture and Natural Resources.

The following departments offer undergraduate instruction in the College: Agricultural and Resource Economics, Animal Science, Natural Resources Management and Engineering, Nutritional Sciences, Pathobiology, and Plant Science. The Directory of Courses section of this *Catalog* describes the course offerings of these departments. Other courses are offered under the departmental listing Agriculture and Natural Resources.

The four-year curriculum leads to the Bachelor of Science degree.

Admission Requirements. See Admission to the University and New England Regional Student Program.

Scholarships. Over \$200,000 in scholarships and awards are available to students in the College of Agriculture and Natural Resources.

Faculty Advisors. Faculty advisors are assigned to students upon entry into the College of Agriculture and Natural Resources according to a student's major and area of special interest. Advisors assist students in the selection of appropriate courses and help them develop an individualized program of study for the Baccalaureate that will meet educational and career goals.

Bachelor's Degree Requirements

Upon recommendation of the faculty the degree of Bachelor of Science is awarded by vote of the Board of Trustees to students who have met the following requirements: (1) earned a total of 120 degree credits; (2) earned at least a 2.0 grade point average for the total number of calculable credits for which they have been registered; (3) earned at least a 2.0 grade average for all calculable Upper Division course work; (4) met all the requirements of the University of Connecticut and the College of Agriculture and Natural Resources.

Plan of Study

Students should work closely with their advisors to review requirements, recommended courses, and career goals. Each student should prepare a tentative plan of study, outlining all courses, with an academic advisor as early as possible, but in no case later than at the start of the junior year. A final plan of study, approved by the major advisor and the department head, must be filed with the Degree Auditor no later than the end of the fourth week of classes of the semester in which a student expects to graduate.

General Education Requirements

All students in the College of Agriculture and Natural Resources must meet the University-wide General Education Requirements (GER) as described in the Appendix of this *Catalog*. Students must select approved courses to meet requirements.

36 Credit 200-Level Requirement for All Majors

Students in all majors in the College of Agriculture and Natural Resources must successfully complete at least 36 credits of **200-level courses** in or relating to their major. Courses for this 36 credit group may be taken from specific major requirements (as listed below for some majors), or may be selected according to a student's individual educational and career goals. This group of courses must:

1. be numbered 200 or above
2. be approved by the student's advisor and department head
3. be taken at the University of Connecticut¹
4. be taken in two or more departments
5. include at least 15 credits from departments in the College of Agriculture and Natural Resources.
6. have a combined grade point average at least 2.0
7. not include more than 6 credits of independent study or internship
8. not be taken on Pass/Fail

Specific Course Requirements for Individual Majors

Students must complete specific courses for individual majors as outlined below. Many courses may be used to meet more than one requirement.

Undergraduate Majors

Students in most majors have a great deal of latitude in the choice of courses and may emphasize a range of options to meet personal objectives. Students may prepare for career opportunities in such diverse activities as research, production, distribution, business and industry, public service, professional service, education, communications, product development, international development, environmental protection, and community resource development. Students interested in agricultural education should refer to the School of Education section of this *Catalog*. In addition to formal course work students may participate in independent study projects, field internships, cooperative education, and practicums. Students may also prepare for formal education beyond the Bachelor of Science degree.

Faculty are available to discuss with prospective students the requirements, recommended courses, and career opportunities of the various majors.

Agriculture and Natural Resources

This individualized major is designed for students who want broad training in agriculture and natural resources. Students and their advisors work together to develop a personalized program of study according to a student's educational and career goals.

Agriculture and Natural Resources majors do not have to meet specific course requirements, but must complete the 36 credit, 200-level requirement as approved by advisor and department head.

Agronomy

Agronomy, in the Department of Plant Science, is the study of soils and land use and the production and management of turf and field crops. A thorough knowledge of the relationship between soils and the growth of plants is the basis for environmentally sound practices and efficient land use.

The turfgrass concentration in Agronomy is designed to provide students basic and applied knowledge in turfgrass science. Students completing the program will be able to apply their skills toward the management of lawns, golf courses, athletic and recreational fields, roadsides, sod farms, erosion control projects, and other areas where turfgrass is utilized. Formal courses in turfgrass science and related topics will be complemented with hands-on training in the establishment, management, and maintenance of turf for various purposes.

Agronomy majors must pass the following courses:

- Biology 110
- Chemistry 122 or 127
- Plant Science 213 or MCB 259
- Plant Science 250

In addition, agronomy majors must earn a minimum of 9 credits from courses in Biology², Chemistry, Computer Science, Geology and Geophysics, Mathematics³, Physics, Statistics⁴.

¹ Transfer students should refer to the "Transfer Students" statement included in this section.

² Students may not receive more than 12 credits for courses in Biology at the 100's level.

³ Math 101 cannot be used to meet this requirement.

⁴ See Statistics section for credit restrictions.

Animal Science

This major provides four options leading to the B.S. degree: Pre-professional (veterinary medicine or graduate training), Business/Service, Equine Sciences and Production Management. By choice of option and selection of electives, Animal Science majors may prepare for a wide variety of careers in animal agriculture including biotechnology, agribusiness, education, extension education, biomedical sciences, livestock management and production, animal product processing, government service, laboratory animal management and trade or breed associations. All options can lead to certification in the American Registry of Professional Animal Scientists. Students preparing for graduate training in animal science or admission to a school of veterinary medicine should follow the pre-professional option.

The curriculum includes courses in cooperating departments within the University. Technical knowledge and practical skills are emphasized through Cooperative Education and other employment opportunities either domestically or internationally.

Species emphasized in the animal science curriculum include beef and dairy cattle, horses, poultry, sheep, swine, and companion and laboratory animals. Individualized programs of study may be developed to emphasize pre-veterinary medicine, animal breeding and genetics, animal physiology, animal nutrition, animal behavior, laboratory animal management, animal product technology, pre-graduate training, teaching, or production and management of livestock, poultry and companion animals.

Animal Science majors must pass the following courses:

One course in Biology (minimum 3 credits)

Chemistry 122 or 127Q

Animal Science 120, 216, 217, 219, 295

Pathobiology 200

Three of the following:

Animal Science 222, 235, 253 or 253W, 254, 269, 273, 275

A minor in Dairy Management is offered by the Department of Animal Science. For details please refer to the section entitled *Dairy Management Minor*.

Environmental Science

The major in Environmental Science is based in the physical and biological sciences, but also includes course work in selected areas of the social sciences. The major leads to a Bachelor of Science degree, and may be adopted by students in either the College of Agriculture and Natural Resources or the College of Liberal Arts and Sciences. This curriculum offers a comprehensive approach to the study of environmental problems, including not only a rigorous scientific background, but also detailed analyses of the social and economic implications of environmental issues. The complexity and interdisciplinary nature of environmental science is reflected in the core requirements of the major. These courses, assembled from several different academic departments representing two colleges, provide both breadth and depth, preparing students for careers that deal with environmental issues, and for graduate study in environmental science and related fields.

Because of the structure of the curriculum, all *Environmental Science majors* follow similar programs during the first two years. Students should decide before the end of their fourth semester on the concentration they wish to pursue for the remainder of their undergraduate program. The diversity of courses required for this degree mandates that students plan their curriculum carefully to meet the minimum requirements of the school in which they are registered. An appropriate advisor will be assigned at the time a concentration is declared. Undecided students should consult with the Director of the Environmental Science program in either the College of Agriculture and Natural Resources or the College of Liberal Arts and Sciences.

The University of Connecticut offers other means for students to pursue environmental interests, which may be more appropriate than the Environmental Science major for some students. In the College of Agriculture and Natural Resources, the departments of Agricultural and Resource Economics, Natural Resource Management and Engineering, and Plant Science offer majors and options for students interested in the environment.

Environmental Science majors must pass the following core requirements:

A. 100's Level Course Work (49-52 credits)

BIOL 107, 108 or 110

ECON 112 or ARE 150

MARN 170

PHYS 131, 132 or 121, 122, 123

CHEM 127, 128

GEOL 102

MATH 115, 116 or 112, 113, 114

STAT 110 or 220

B. 200's Level Course Work (30-31 credits)

Environmental Policy and Law

Select one course from:

ARE 234(W) – Environmental and Resource Policy

NRME 240 – Environmental Law

Environmental Economics

ARE 235 – Environmental and Resource Economics

Atmospheric Science

NRME 241 – Meteorology

Terrestrial Systems

GEOL 251 – Earth Surface Processes

Hydrosphere Dynamics

Select one course from:

EEB 247 – Limnology

GEOL 234 – Introduction to Ground Water Hydrology

MARN 220Q – Environmental Reaction and Transport

MARN 270 – Descriptive Physical Oceanography

NRME 245 – Introduction to Water Resources

Ecological Interactions

EEB 244(W) – General Ecology

Human Impact

GEOG 236 – Human Modifications of Natural Environments

Environmental Health

ANSC 226 – Environmental Health

Chemical and Microbial Reactions

Select one of the following two-course options:

1. CHEM 243, 244 (Organic Chemistry)

2. CHEM 141 (Organic Chemistry) and MCB 229 (Fundamentals of Microbiology) or MCB 203 (Introduction to Biochemistry)

3. CHEM 141 (Organic Chemistry) and GEOL 245 (Introduction to Geochemistry)

In addition to these core requirements, all students majoring in *Environmental Science* must also fulfill the requirements of a concentration in a discipline associated with the program before graduation. Approved concentrations are listed below: all consist of 4 or 5 courses in a specialized field, including a field course or an internship experience.

Resource Economics (Resource Economics, CANR) – Students must pass the following courses: ECON 218(Q), ARE 257, ARE 297. Additionally, students must pass at least two of the following: ARE 238, 255(W), 285, 215C

Environmental Health (Animal Science, CANR) – Students must pass courses in the categories listed:

Molecular and Cellular Biology: Choose any two: MCB 200, 211, 215, 229

Animal Science: Students must pass the following: ANSC 221, 224, 225

Other Departments: choose one of the following: NUSC 236, PATH 200, PATH 297, PHAR 241, PHAR 281, PNB 250(W)

Environmental Chemistry (Chemistry, CLAS) – Students must pass the following courses: CHEM 232Q, 245, 263Q, 264Q, 370

Environmental Biology (Ecology and Evolutionary Biology, CLAS) – All students must take EEB 293S. In addition, they must select at least one course from each of the following groups.

Group I -- Ecological Systems and Processes

EEB 238, 245, 294, 296, 310, PLSC 250

Group II -- Plant Ecology and Systematics

EEB 227, 256, 268, 271, 272, 277, 280

Group III -- Vertebrate Ecology and Systematics

EEB 200, 214, 281, 454, 465

Group IV -- Invertebrate Ecology and Systematics

EEB 243(W), 252, 275, 288

Environmental Geography (Geography, CLAS) – Students must pass the following: GEOG 232, 285W, 286W

In addition, students must pass one of the following courses: 240C, 246C

Environmental Geoscience (Geology, CLAS) – Students must pass the following: GEOL 212, 252, 253

Marine Science (Marine Science, CLAS) – Students are required to com-

are competitive programs to which interested students may apply during their senior year. Students in the Dietetic Program are encouraged to obtain practical experience and to develop an area of concentration in clinical nutrition, community nutrition, or food service management.

Nutritional Biochemistry is a program dealing with organ, cellular, and subcellular levels of nutrition. It provides training for careers in research or medicine and meets the entrance requirements for medical schools. Graduates often conduct research in food companies, drug companies, and pursue graduate education, medical education, or other allied health degrees (eg, physical therapy, dentistry).

Food Science is a program dealing with the control of chemical, physical, and microbiology changes in food during production, processing, packaging, storage, distribution, preparation, and utilization. Graduates often work in product development, quality assurance, and pursue graduate education.

Nutrition Fundamentals provides a broad background in nutrition, which allows more flexibility in career goals. This option includes Community Nutrition, and Food Service Management. Community Nutrition students enroll in more social science courses to enhance their ability to assist individuals, families, and private and public agencies and to evaluate and address nutritional needs in the community setting. Food Service Management includes more management courses. Field experiences are usually part of the Food Service Management and Community Nutrition options.

Nutritional Sciences majors must successfully complete the following courses:

Nutritional Sciences 165
 Nutritional Sciences 200
 Chemistry 127 and 128, or Chemistry 122
 Chemistry 141, or 243 and 244
 Biology (PNB) 264 and 265, or Biology 107, 108 and (PNB) 250
 Biology (MCB) 203 or 204 or 229

In addition to the courses listed above, a minimum of 8 credits, numbered 200 or above, must be earned from courses in the Department of Nutritional Sciences. Credits earned in field experiences and independent studies cannot be used to meet this 8-credit requirement. Specific course recommendations are listed in the *Programs Available* brochure in the department.

Pathobiology

Students majoring in Pathobiology are concerned about animal health and diseases and their relationship to people and the environment. Subjects covered include gross and microscopic study of normal and pathological anatomy, microbiology, ecology of disease, and specific diseases of laboratory animals, domestic mammals, birds, and free-living mammals.

Students can prepare to enter veterinary medical schools or medical schools. Pathobiology majors also pursue careers in biotechnology, biomedical sciences, para-veterinary medicine, and many diverse laboratory and research positions in health fields and agriculture and natural resources.

Pathobiology majors must pass the following courses:

PATH 297
 One course in Microbiology: MCB 229
 One course in Biochemistry: MCB 203 or MCB 204
 One course in Genetics: MCB 200, MCB 213, or ANSC 217
 One course in Nutrition or Immunology: ANSC 216, NUSC 165, MCB 211, or MLS 208W
 Three of the following courses: PATH 200, 202, 248, 252, 296

Resource Economics

The Resource Economics major in the Department of Agricultural and Resource Economics applies economic and business methods to address problems pertaining to the production and distribution of food products and the management of natural resources and the environment. There is a wide range of areas of specialization including environmental economics and policy, marketing and business management, and international agricultural development and trade. Students can go through either a structured curriculum or with the assistance of a faculty advisor, create one to meet individual career goals. Our graduates pursue careers in environmental fields, business management and marketing, resource and recreational management, and banking and finance. The Resource Economics program also provides students with the background to pursue graduate studies.

Resource Economics majors do not have to meet specific course requirements, but must complete the 36 credit, 200-level requirement as approved by advisor and department head.

Double Major Option. Students may elect to complete requirements for two major fields of study offered by the College of Agriculture and Natural Resources. A student selecting this option must submit a Double Major Declaration form indicating primary and secondary majors. This declaration must include a tentative plan of study and requires approval by the advisors and department heads for both respective major areas of study and the Associate Dean. Once an approved declaration has been submitted to the Degree Auditor, the student must complete the requirements for both majors in order to graduate. Withdrawal of the Double Major Declaration requires the approval of the Associate Dean. The student's final plan and record of study will include a double major attachment to verify that the requirements have been met for both the primary and secondary majors. The transcript will identify both majors.

Primary Major. Students must meet all requirements as listed under "Requirements for a Major" (36 credit group) and all individual major requirements as listed above.

Secondary Major. Students must meet all individual major requirements as listed above and successfully complete additional 200-level course work *not* used as part of the 36 credit group for the primary major. This group of courses must:

1. total not less than 24 credits
2. be numbered 200 or above
3. be approved by student's advisor and department head
4. be taken at the University of Connecticut
5. include at least 15 credits of College of Agriculture and Natural Resources courses
6. average at least a 2.0 Grade Point Average
7. not include more than six credits of Independent Study and Internship
8. not be taken on Pass/Fail.

Undergraduate Minors

Aquaculture Minor

This minor will provide interested students with a basic understanding of aquaculture, especially in closed circulation systems. Students will be required to complete 18 credits which include a common core for all students and a selection of courses based on a specific area of interest. The requirements for the minor are:

NRME 208, EEB 200, PNB 235, one 2-credit internship (as approved by advisor), and two courses from the following:

NRME 235Q	ARE 215C	PATH 256
ANSC 253	NUSC 212	EEB 294/MARN 294

Dairy Management Minor

The minor in Dairy Management is intended to provide interested students with an in-depth exposure to all aspects of dairy farm management including quality milk production, cattle health management, personnel management, and farm financial management. Students will have the opportunity to manage a portion of the UConn dairy herd and be responsible for daily activities and short and long-term decision-making. Completion of the program will provide students with the knowledge base necessary to pursue employment in dairy production at the managerial level or to seek employment in other aspects of the dairy industry. The requirements for this minor are:

ANSC 275	ANSC 277S	ANSC 278
PATH 202	ARE 215C	ARE 217

Landscape Design Minor

The minor in Landscape Design will provide an introduction to landscape architecture, the communication of ideas via presentation drawing, and the methodology of designing the landscape to meet individual and societal needs. These concepts will be complemented by appropriate course work in the ornamentation and maintenance of the landscape environment as well as consideration of contemporary issues affecting landscape development.

