

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 \$150,000 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 interdisciplinary major is designed for students who want broad training in agriculture and natural resources. Students work with their advisors to develop a personalized program of study.

Agronomy

This major offers two areas of concentration. Turfgrass Science includes the management of lawns, golf courses, athletic fields, roadsides, erosion control sites, and other areas where grasses are grown. The Soil Science option prepares students for professional certification. Courses focus on soil identification and suitability for different uses. (For detailed information, please refer to www.canr.uconn.edu/plsci)

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.

Animal Science

This major provides seven options leading to the B.S. degree: Pre-professional (veterinary medicine or graduate training), Biotechnology, Business/Service, Equine Sciences, Food Science, Environmental Health, and Production Management. Minors in Dairy Management and in Food Science are also available. (For detailed information, please refer to: www.canr.uconn.edu/ansci)

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 majors must pass the following courses:

Group A. (All of the following): ANSC 120, 216, 217, 219, 295, PATH 200, BIOL 107, CHEM 122 or 127Q

All students must pass 4 courses from Groups B and C. This must include at least one course from Group B and at least 2 courses from Group C.

Group B: ANSC 235, 254, 269, 273, 275

Group C: ANSC 222, 224, 226, 229, 253 or 253W. Either MCB 203 or 204 or 229 can fulfill one of the Group C requirements.

The Department of Animal Science offers a minor in Dairy Management and in Food Science. These are described in the *Minors* section of this *Catalog*.

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.

Environmental Science majors must pass the following core requirements:

A. 100's Level Course Work (49-52 credits)
BIOL 107, 108 or 110 CHEM 127, 128
ECON 112 or ARE 150 GEOL 102
MARN 170 MATH 115, 116 or 112, 113, 114
PHYS 131, 132 or 121, 122, 123 STAT 100, 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

Select one course from:

NRME 241 - Meteorology
NRME 271 - Environmental 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 211 - Watershed Hydrology

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:

- CHEM 243, 244 (Organic Chemistry)
- CHEM 141 (Organic Chemistry) and MCB 229 (Fundamentals of Microbiology) or MCB 203 (Introduction to Biochemistry)
- CHEM 141 (Organic Chemistry) and GEOL 235 (Chemical Hydrogeology).

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) - 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) - 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)

Natural Resources (Natural Resources Management and Engineering) - Students must pass five courses from the following group: NRME 204, 205, 210, 214, 217, 237, 239P, 242, 260Q/260P, 287

Soil Science (Plant Science) - Students must pass the following courses: PLSC 205, 250, 259C

In addition, students must select two courses from the following: NRME 260Q/260P, PLSC 253(W), 258, 372, 375, 377, 378

Environmental Sciences also offers the following concentrations through the College of Liberal Arts and Sciences. For complete descriptions of their requirements, refer to the Environmental Science description in the *College of Liberal Arts and Sciences* section of this *Catalog*:

Environmental Chemistry (Chemistry)
Environmental Biology (Ecology and Evolutionary Biology)
Environmental Geography (Geography)
Environmental Geoscience (Geology)
Marine Science (Marine Science)

Horticulture

The Horticulture major offers courses in the commercial production of vegetables and fruits, propagation and production of woody and herbaceous ornamental plants, and the identification, uses, and maintenance of plants in landscapes and gardens. The Plant Biotechnology option includes micropropagation and the application of molecular methods to genetic improvement of plants. (For detailed information, please refer to www.canr.uconn.edu/plsci)

Horticulture majors must pass the following courses:

Biology 110 Chemistry 122 or 127Q
Plant Science 250 Plant Science 238
Plant Science 213 or Biology (MCB 259)

One of the following:

Agricultural and Resource Economics 150 or 215C
Economics 112 or 113 Accounting 131

One of the following:

Plant Science 260, 261, or 231 Biology (EEB 272)
Natural Resources Management and Engineering 214

Two of the following:

PLSC 203, 204, 257, or EEB 288 or equivalent

Two of the following:

Plant Science 212, 225, 227, 240, 240W, 244, 245, 263, 264, 289, or 292

In addition, horticulture majors must earn a minimum of 9 credits from the following departments: Biology², Chemistry, Computer Science, Geology and Geophysics, Mathematics³, Physics, Statistics⁴.

Landscape Architecture

This major provides instruction in site planning and design, landscape history, landscape architectural graphics and presentation. It includes the use of plants and other features to enrich exterior spaces. Through seminars, studio projects and internships, students learn to apply theory to actual case studies. The program is accredited by the American Society of Landscape Architects.

Landscape Architecture majors must pass the following courses:

Biology 110

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.

Chemistry 122 or 127Q
 Plant Science 250
 Plant Science 213 or MCB 259
 Plant Science 252, 255, 256, 260, 261, 262, 263C, 265, 266, 267, 271, 275, 276, 277, 280, 281, 290W, 293

Accreditation and space restrictions necessitate that the number of students in the Landscape Architecture program be limited. All students admitted into the Landscape Architecture program will be evaluated at the end of their third semester (or middle of their sophomore year). Students will be allowed to continue in the program based upon their TGPA, successful completion of recommended courses during their first and second semester, and grades earned in the introductory Landscape Architecture courses offered during the third semester (PLSC 255: Landscape Design Drawing, and PLSC 275: Landscape Design). Students who do not meet these requirements may want to consider other majors including Horticulture or the turf option in Agronomy. (For detailed information, please refer to www.canr.uconn.edu/plsci)

A minor in Landscape Design is described in the *Minors* section.

Natural Resources

This major, offered by the Department of Natural Resources Management and Engineering is concerned with the application of scientific principles and modern technology to the understanding and management of natural resources and the systems of which they are a part. Students can pursue a general interdisciplinary set of courses, or concentrate in a specific discipline such as air, fisheries, forest, water, or wildlife resources, or geographic information science and remote sensing. (For detailed information, please refer to: www.canr.uconn.edu/nrme)

Natural Resources majors must pass the following courses:

Natural Resources Management and Engineering 100, 239P, 242, 252, 256, 295

Plant Science 250
 Biology (EEB) 244 or 244W
 Mathematics 113 or 115
 One course in Chemistry
 One course in Statistics
 One course in Physics or Geology

Students must also earn an additional 12 credits in NRME courses, numbered 200 or above.

Nutritional Sciences

Options in this major are: Dietetics, Preprofessional Program in Nutritional Biochemistry, Nutrition for Exercise and Sport, Food Science, and Nutrition Fundamentals. The American Dietetics Association has granted Developmental Accreditation to the Didactic Program in Dietetics in Nutritional Sciences for students preparing to become registered dietitians. Other areas where Nutritional Sciences graduates may be employed include nutrition education in the community and in schools, sport nutrition centers, cooperative extension, food companies, and food service management. (For detailed information, please refer to: www.canr.uconn.edu/nusci)

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 focus on animal health and diseases and their relationship to people and the environment. 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. (For detailed information, please refer to: www.canr.uconn.edu/patho)

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, Immunology, or Cell Biology: ANSC 216, NUSC 165, MCB 210, MCB 211, or MLS 208W
 Three of the following courses: PATH 200, 202, 235, 248, 252, 256, 296

Resource Economics

This major in the Department of Agricultural and Resource Economics applies analytical and decision-making skills to problems of production and distribution of food products and the management of natural resources and the environment. Options in this major are: Agribusiness Management and Environmental Economics and Policy. These prepare students for a wide variety of careers in the business and government sectors, or to pursue graduate studies.

Resource Economics majors earn a minimum of 15 credits, numbered 200 or above, from courses in the Department of Agricultural and Resource Economics, and a minimum of 9 credits, numbered 200 or above, from recommended courses outside the Department. (For detailed information, please refer to: www.are.uconn.edu/)

Individualized Major

The Individualized Major program allows students to create a major that is not otherwise offered at the University of Connecticut. Students pursuing an Individualized Major must meet all university-level and college-level requirements for graduation and complete at least 36 credits of approved 200 level courses. Requirements for declaring and completing an Individualized Major are listed below:

- Students must be in good academic standing with a minimum GPA of 2.0 to declare an Individualized Major.
- Students must submit a proposed statement of purpose and identify three faculty members who are willing to serve as an advisory committee.
- An Individualized Major has a minimum of 36 credits from 200 level courses which must:
 - be from two or more departments
 - include at least 18 credits from departments in the College of Agriculture and Natural Resources
 - be approved by the student's advisory committee
 - be taken at the University of Connecticut
 - have a combined Grade Point Average of at least 2.0
 - include no more than 6 credits of Independent Study and Internship
 - not to be taken on Pass/Fail
 - meet all requirements of the "36 Credit Group" of the College of Agriculture and Natural Resources

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.

The College of Agriculture and Natural Resources offers Minors in Aquaculture, Dairy Management, Food Science, Landscape Design, and Nutrition for Exercise and Sport. All of these are described in the *Minors* section of this *Catalog*.

Pre-veterinary Medicine Programs. Prerequisites for entry into a professional curriculum in veterinary medicine may be obtained by majoring in Animal Science or Pathobiology. The Animal Science major is most appropriate for students interested in biotechnology, physiology, nutrition, genetics, behavior, or production and management. Pathobiology is appropriate for students interested in biomedical science, medical biotechnology, ecology of diseases, anatomy, microbiology, or diseases of wildlife.

Honors Programs. University honors programs are available to qualified students in the College. Please refer to the section of this *Catalog* designated "Honors Programs" for further information.

Transfer Students. Transfer students can use transfer credits to meet General Education requirements and 100-level course requirements in a specific major. Transfer students may apply a maximum of six credits of 200-level work toward the 36 credit requirement for a major. These credits must be identified as courses

comparable to specific University of Connecticut courses and cannot include internships, special topics, or unassigned credits. Transfer students must complete at least 30 credits of 200-level course work at the University of Connecticut, including at least 15 credits in College of Agriculture and Natural Resources courses.

Exemptions and Substitutions. Students requesting an exemption from any University and/or College requirement, or a substitution for a course or requirement, should consult their advisors. Such exemptions or substitutions must be approved by the department head and the Associate Dean of the College and may require approval of the Vice President for Academic Affairs.

Field Trips and Transportation Costs. Many courses require off-campus field trips. Students should budget money for participation.

Graduate Programs. Most departments provide graduate programs for students interested in greater specialization beyond the baccalaureate. The study may lead to a Master of Science or Doctor of Philosophy degree. Students planning for a graduate program should secure a comprehensive background in the basic sciences. For further information see the announcement of the Graduate School.