Forestry

Forestry Curriculum

The forestry curriculum offers courses dealing with the management of forest ecosystems for multiple benefits including biodiversity, recreation, water, wilderness, wildlife, and wood and fiber. Conservation and preservation of natural resources are emphasized. The department offers work for the Bachelor of Science degree with a major in forestry and options in forest ecosystem management, interpretation of natural resources, urban and community forestry, natural resource conservation and restoration, or sustainable materials science and technology. All options lead to a professional degree in forestry (Bachelor of Science). The forestry major has been accredited by the Society of American Foresters (SAF) since 1935. The Council for Higher Education Accreditation recognizes SAF as the specialized accrediting body for forestry education in the United States. The primary goal of the undergraduate curriculum in forestry is to educate foresters to be capable of scientifically managing the nation's forest lands and related ecosystems - private and public.

Graduates understand and can apply scientific principles associated with forests, forest ecosystem management, and wood and non-wood products. Graduates are able to communicate effectively and work well in teams. They are capable of preparing and delivering effective oral and written communication of scientific and technical decisions to professional and lay audiences. They are proficient in technical skills such as measurements, computer usage, inventory, economic analysis, data and situation analysis, and ecosystem assessment. They recognize the importance of ethics in forestry and are sensitive to cultural diversity and broad environmental concerns.

Graduates of the forest ecosystem management option are skilled at understanding how forests function and how forests can be managed to produce desired goods (wood, fiber, recreation, wildlife habitat) and services (clean water, carbon sequestration, wilderness) in the long-run. They are skilled at interpretation of interactions and effects of abiotic and biotic factors in forests and quantification of bio-physical, social, and economic outputs from forest ecosystems. They are skilled at complex decision-making involving private and public forest resources where ethical, legal, social, economic, and ecological dimensions are explicitly considered.

Graduates of the interpretation of natural resources option are skilled at communicating with the public about the values associated with forest ecosystems and providing educational programs for all ages.

Graduates of the urban and community forestry option are able to combine biological, social, legal, and economic expertise to effectively manage trees or forests in an urban setting. They are skilled at decision-making related to site assessment, and long-term management of urban trees and forests to achieve multiple goals.

Graduates of the natural resource conservation and restoration option are skilled at assessing the natural functions of the environment and human impacts. They are skilled at interpretation of forest and other natural environments and making decisions relating to their conservation and preservation.

Graduates of the sustainable materials science and technology option understand the anatomical, physical, and chemical properties of wood and other bio-renewable materials and know wood processing operations involved in drying, composite materials manufacturing, and chemical treatment.

In consultation with their adviser, students can select elective courses related to elective courses in the forest ecosystem management option to emphasize forest ecology; wildlife, wilderness, and recreation management; water quality and erosion protection; quantitative-analytical techniques; business and marketing; and other areas related to natural resource management. Elective courses in the urban and community forestry option can be selected to emphasize plant health, policy and planning, ecology, hydrology, sociology, business administration, or horticulture/design. Elective courses related to the natural resource conservation and restoration option can be selected to emphasize, ecology, wildlife, recreation, nature interpretation, landscape design, sociology and ethics of conservation and preservation. Similarly, elective courses in the sustainable materials science and technology option can be selected to emphasize wood production, bio-renewable materials, wood fiber, business and marketing, and quality assurance. Elective courses in the interpretation of natural resources option can be selected to emphasize natural history, animal ecology, and environmental education.

Many private firms as well as national, regional, state, and local agencies seek forestry graduates to fill positions in management of natural resources for commodity and non-commodity multiple benefits. Graduates in forestry are prepared to be involved with evolving forestry systems, such as agroforestry and urban forestry. Wood processing industries, such as composite products, plywood, particle board, lumber, and pulp and paper offer professional opportunities in production, product development, quality control, and marketing.

With advanced graduate study, the range of professional job opportunities for a person with a B.S. in forestry is expanded. Opportunities include research and education as well as more specialized managerial and administrative positions with private firms and public agencies.

During fall semester of the second year of study (sophomore year, typically), forestry students are required to enroll in the department's integrated forestry modules consisting of:

FOR 201	Forest Biology	2
FOR 202	Wood Utilization	2
FOR 203	Resource Measurements/Evaluation	2
FOR 204	Forest Ecosystem Decision-Making	2
FOR 205	Integrated Forestry Laboratory	3
FOR 206	Fall Forestry Camp	4

That semester, consisting entirely of forestry coursework, is designed to give students an early understanding of the many aspects of forestry and how they are interrelated. In addition to work in the classroom, students will spend time in laboratory and field work each week. A 3-week off-campus fall camp during the semester will reinforce concepts learned both in the classroom and during laboratory/field sessions. Transfer students should check with the department for counsel on timing their completion of the integrated forestry modules.

Forestry Minor

The department offers a minor in forestry which can be earned by completion of a minimum of 15 credits in forestry courses. Students wishing to emphasize management and environmental aspects of forestry must select at least 15 credits from the following courses:

FOR 302	Silviculture	3
FOR 356	Dendrology	4
FOR 451	Forest Resource Economics and Quantitative Methods	4
FOR 452	Ecosystem Management	3
FOR 475	Urban Forestry	3
NREM 120	Introduction to Renewable Resources	3
NREM 301	Natural Resource Ecology and Soils	4
NREM 345	Natural Resource Photogrammetry and Geographic Information Systems	3
NREM 390	Fire Ecology and Management	3
NREM 407	Watershed Management	4

Sustainable materials science and technology emphasis: FOR 280 Wood Properties and Identification and an additional 12 credits from the following courses:

FOR 480	Wood Anatomy and Fiber Analysis	3
FOR 481	Conversion of Lignocellulosic Materials	3
FOR 483	Wood Deterioration and Preservation	3
FOR 485	Wood and Natural Fiber Composites	3
FOR 486	Drying Processes for Wood and Other Lignocellulosic Materials	3
FOR 487	Physical Properties of Wood	4
NREM 490B	Independent Study: Forestry	1-4

Curriculum in Forestry

Total Degree Requirement: 128 cr.

Only 65 cr. from a two-year institution may apply which may include up to 16 technical cr.; 9 P-NP cr. of free electives; 2.00 minimum GPA.

International Perspective: 3 cr.

U.S. Diversity: 3 cr.

Communications Proficiency (with a C or better):

English composition	6
Speech fundamentals	3
Total Credits	**9**

Communication/Library: 13 cr.

ENGL 150	Critical Thinking and Communication	3

ENGL 250	Written, Oral, Visual, and Electronic Composition	3
One of the following:		3
ENGL 302	Business Communication	
ENGL 309	Report and Proposal Writing	
ENGL 312	Biological Communication	
ENGL 314	Technical Communication	
SP CM 212	Fundamentals of Public Speaking	3
LIB 160	Information Literacy	1
Total Credits		**13**

Humanities and Social Sciences: 6 cr.

6 cr. from approved list.

Ethics: 3 cr.

3 cr. from approved list.

Life Sciences: 6 cr.

BIOL 211	Principles of Biology I	3
Approved life sciences course		3
Total Credits		**6**

Mathematics, Physical and Life Sciences: 22 cr.

MATH 140	College Algebra	3
MATH 150	Discrete Mathematics for Business and Social Sciences	3
STAT 101	Principles of Statistics	4
CHEM 163	College Chemistry	4
CHEM 163L	Laboratory in College Chemistry	1
BIOL 211	Principles of Biology I	3
BIOL 211L	Principles of Biology Laboratory I	1
AGRON 154	Fundamentals of Soil Science	3
Total Credits		**22**

Forestry: 29 cr.

NREM 104	Practical Work Experience	R
NREM 110	Orientation in Natural Resource Ecology and Management	1
NREM 120	Introduction to Renewable Resources	3
NREM 211	Careers in Natural Resources	1
FOR 201	Forest Biology	2
FOR 202	Wood Utilization	2
FOR 203	Resource Measurements/Evaluation	2
FOR 204	Forest Ecosystem Decision-Making	2
FOR 205	Integrated Forestry Laboratory	3
FOR 206	Fall Forestry Camp	4
FOR 302	Silviculture	3
FOR 451	Forest Resource Economics and Quantitative Methods	4
FOR 454	Forestry Practicum	3
Total Credits		**30**

Electives: Students majoring in forestry are required to choose one of the following options at the end of their sophomore year: forest ecosystem management; sustainable material science and technology; urban and community forestry; natural resource conservation and restoration; or interpretation of natural resources.

Forest Ecosystem Management

BIOL 212	Principles of Biology II	3
BIOL 212L	Principles of Biology Laboratory II	1
FOR 280	Wood Properties and Identification	4
FOR 442	Dynamics of Forest Stands	3
FOR 356	Dendrology	4
FOR 452	Ecosystem Management	3
MATH 151	Calculus for Business and Social Sciences	3-4
or MATH 181	Calculus and Mathematical Modeling for the Life Sciences I	
NREM 301	Natural Resource Ecology and Soils	4
NREM 345	Natural Resource Photogrammetry and Geographic Information Systems	3
PL P 416	Forest Insects and Diseases	3
PL P 416L	Forest Insects and Diseases Laboratory	1
One course from the following:		3
NREM 385	Natural Resource Policy	
or NREM 460	Controversies in Natural Resource Management	
Total Credits		**35-36**

Interpretation of Natural Resources

A ECL 365	Vertebrate Biology	4
A ECL 366	Natural History of Iowa Vertebrates	3
BIOL 212	Principles of Biology II	3
BIOL 212L	Principles of Biology Laboratory II	1
BIOL 366	Plant Systematics	4
ENT 370	Insect Biology	3
FOR 452	Ecosystem Management	3
NREM 303	Internship	1-3
NREM 330	Principles of Interpretation	3
One course from the following:		3
BIOL 474	Plant Ecology	
FOR 356	Dendrology	
One course from the following:		3
AGRON 206	Introduction to Weather and Climate	
GEOL 100	The Earth	
ASTRO 102	North Star Astronomy	
GEOL 101	Environmental Geology: Earth in Crisis	
GEOL 108	Introduction to Oceanography	
One course from the following:		3
NREM 385	Natural Resource Policy	
NREM 460	Controversies in Natural Resource Management	
Total Credits		**34-36**

Natural Resource Conservation and Restoration

A ECL 312	Ecology	4
BIOL 212	Principles of Biology II	3
BIOL 212L	Principles of Biology Laboratory II	1
BIOL 204	Biodiversity	2
FOR 356	Dendrology	4
FOR 452	Ecosystem Management	3
NREM 301	Natural Resource Ecology and Soils	4
NREM 330	Principles of Interpretation	3
NREM 390	Fire Ecology and Management	3
NREM 407	Watershed Management	4
MATH 151	Calculus for Business and Social Sciences	3-4
or MATH 181	Calculus and Mathematical Modeling for the Life Sciences I	
PL P 416	Forest Insects and Diseases	3
PL P 416L	Forest Insects and Diseases Laboratory	1
One course from:		3
NREM 385	Natural Resource Policy	
NREM 460	Controversies in Natural Resource Management	
Three credit hours from approved list of electives		3
Total Credits		**44-45**

Sustainable Materials Science and Technology

FOR 280	Wood Properties and Identification	4
FOR 480	Wood Anatomy and Fiber Analysis	3
FOR 481	Conversion of Lignocellulosic Materials	3
FOR 483	Wood Deterioration and Preservation	3
FOR 485	Wood and Natural Fiber Composites	3
FOR 486	Drying Processes for Wood and Other Lignocellulosic Materials	3
FOR 487	Physical Properties of Wood	4
MATH 151	Calculus for Business and Social Sciences	3
TSM 270	Principles of Injury Prevention	3

or TSM 310	Total Quality Improvement	
Total Credits		**29**

Urban and Community Forestry

BIOL 212	Principles of Biology II	3
BIOL 212L	Principles of Biology Laboratory II	1
FOR 280	Wood Properties and Identification	4
C R P 201	Making the Metropolis	3-4
or C R P 301	Planning Methods Studio	
HORT 342	Landscape Plant Installation, Establishment, and Maintenance	3
FOR 356	Dendrology	4
FOR 452	Ecosystem Management	3
FOR 475	Urban Forestry	3
MATH 151	Calculus for Business and Social Sciences	3-4
or MATH 181	Calculus and Mathematical Modeling for the Life Sciences I	
PL P 416	Forest Insects and Diseases	3
PL P 416L	Forest Insects and Diseases Laboratory	1
SOC 310	Community	3
or SOC 382	Environmental Sociology	
One course from the following:		3
NREM 385	Natural Resource Policy	
NREM 460	Controversies in Natural Resource Management	
Total Credits		**37-39**