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 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 prepared 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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>FOR 201</td>
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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:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>FOR 302</td>
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<td>FOR 356</td>
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<td>FOR 451</td>
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<tr>
<td>FOR 452</td>
<td>3</td>
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<td>FOR 475</td>
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<tr>
<td>NREM 120</td>
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<td>NREM 301</td>
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<td>NREM 345</td>
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<td>NREM 390</td>
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<td>NREM 407</td>
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Sustainable materials science and technology emphasis: FOR 280 Wood Properties and Identification and an additional 12 credits from the following courses:

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>FOR 480</td>
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<td>FOR 481</td>
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<tr>
<td>FOR 483</td>
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<tr>
<td>FOR 485</td>
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<tr>
<td>FOR 486</td>
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<tr>
<td>NREM 490B</td>
<td>1-4</td>
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</tbody>
</table>

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):

<table>
<thead>
<tr>
<th>Course</th>
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<tr>
<td>ENGL 150</td>
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</table>

Total Credits 9

Communication/Library: 13 cr.
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**
FOR 212  Principles of Biology II  3
FOR 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
or MATH 181  Calculus and Mathematical Modeling for the Life Sciences I  3
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  4
NREM 407  Watershed Management  4
MATH 151  Calculus for Business and Social Sciences  3
or MATH 181  Calculus and Mathematical Modeling for the Life Sciences I  3
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
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<tr>
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<tr>
<td>BIOL 212</td>
<td>Principles of Biology II</td>
<td>3</td>
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<tr>
<td>BIOL 212L</td>
<td>Principles of Biology Laboratory II</td>
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<tr>
<td>FOR 280</td>
<td>Wood Properties and Identification</td>
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<tr>
<td>C R P 201</td>
<td>Making the Metropolis</td>
<td>3-4</td>
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<tr>
<td>or C R P 301</td>
<td>Planning Methods Studio</td>
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<td>HORT 342</td>
<td>Landscape Plant Installation, Establishment, and Maintenance</td>
<td>3</td>
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<tr>
<td>FOR 356</td>
<td>Dendrology</td>
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<td>FOR 452</td>
<td>Ecosystem Management</td>
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<tr>
<td>FOR 475</td>
<td>Urban Forestry</td>
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<td>MATH 151</td>
<td>Calculus for Business and Social Sciences</td>
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<tr>
<td>SOC 310</td>
<td>Community</td>
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<td>or SOC 382</td>
<td>Environmental Sociology</td>
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<td>One course from the following:</td>
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**Total Credits: 37-39**