FORREST ECOSYSTEM MANAGEMENT, B.S.

Begin Campus: Any Penn State Campus
End Campus: University Park

Program Description
The mission of the B.S. program in Forest Ecosystem Management is to help students develop the knowledge, skills, and professional ethics for understanding and managing forest ecosystems and living as responsible members of society.

The Forest Ecosystem Management major provides for the education necessary for students to pursue professional careers in one of the following options:

1. Forest Biology
2. Forest Management
3. Community and Urban Forest Management
4. Watershed Management

These options also will prepare students for graduate studies in continuing professional education.

Forest Biology Option
This option provides a strong background in the biological and ecological aspects of contemporary forestry and establishes a sound foundation for professional employment and graduate-level study in forest and environmental sciences.

Forest Management Option
This option provides professional training in the management of forest lands consistent with the needs of ownership objectives. Employment opportunities include forest management positions with public agencies, industry, and private consulting.

Community and Urban Forest Management Option
This option helps prepare students to manage community trees and green spaces. It emphasizes technical expertise, communication abilities, and skills for working with diverse people. Employment opportunities include municipalities, arboricultural companies, utilities, and government agencies.

Watershed Management Option
This option focuses on water resources and the integrated management of natural resources with emphasis on water. Graduates qualify for federal employment as hydrologists and for water-related careers in municipal watershed management, state and local government, and environmental/engineering consulting.

What is Forest Ecosystem Management?
Professional foresters are challenged with the conservation, restoration, and sustainable provision of a wide range of forest ecosystem services, including timber and nontimber forest products, wildlife habitat, biodiversity, clean water, healthy soils, carbon sequestration, recreational opportunities, and the aesthetics of both rural and urban landscapes. Foresters need specialized knowledge to manage for this wide range of ecosystem services. The Forest Ecosystem Management program teaches students to identify, measure, and quantify a variety of forest ecosystem attributes; communicate effectively with diverse groups; analyze and interpret natural resources information in an ecological, economic, and social context; and integrate the relevant ecological, economic, and societal aspects of contemporary problems in natural resources management and use this understanding to develop, support, and implement effective solutions.

You Might Like this Program If...
- You enjoy working outdoors
- You have a concern for natural resources and an appreciation of nature
- You have an analytical mind to manage complex ecological systems and resolve environmental, economic, and social challenges
- You have an aptitude for innovation and strategic thinking

Entrance to Major
In order to be eligible for entrance to this major, a student must:

1. attain at least a C (2.00) cumulative grade-point average for all courses taken at the University; and
2. have third-semester classification (http://www.registrar.psu.edu/enrollment/semester-classification.cfm).

READ SENATE POLICY 37-30: ENTRANCE TO AND CHANGES IN MAJOR PROGRAMS OF STUDY (http://senate.psu.edu/policies-and-rules-for-undergraduate-students/37-00-entrance-to-a-college-or-major/)

Degree Requirements
For the Bachelor of Science degree in Forest Ecosystem Management, a minimum of 120 credits is required for the Forest Biology, Forest Management, and Watershed Management options, and a minimum of 123 credits is required for the Community and Urban Forest Management option:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education</td>
<td>45</td>
</tr>
<tr>
<td>Electives</td>
<td>2-11</td>
</tr>
<tr>
<td>Requirements for the Major</td>
<td>88-100</td>
</tr>
</tbody>
</table>

21-24 of the 45 credits for General Education are included in the Requirements for the Major. This includes: 9 credits of GN courses; 6 credits of GQ courses; 3-6 credits of GS courses; 0-3 credits of GA courses; 3 credits of GWS courses.

Students should be aware that, in most cases, completion of the Forest Ecosystem Management degree in four years requires enrollment at the University Park Campus beginning the fall semester of the sophomore year.

General Education
Connecting career and curiosity, the General Education curriculum provides the opportunity for students to acquire transferable skills necessary to be successful in the future and to thrive while living in interconnected contexts. General Education aids students in developing intellectual curiosity, a strengthened ability to think, and a deeper sense of aesthetic appreciation. These are requirements for all baccalaureate students and are often partially incorporated into the requirements of a program. For additional information, see the General Education Requirements (http://bulletins.psu.edu/undergraduate/general-
education/baccalaureate-degree-general-education-program/) section of the Bulletin and consult your academic adviser.

The keystone symbol appears next to the title of any course that is designated as a General Education course. Program requirements may also satisfy General Education requirements and vary for each program.

**Foundations (grade of C or better is required.)**
- Quantification (GQ): 6 credits
- Writing and Speaking (GWS): 9 credits

**Knowledge Domains**
- Arts (GA): 6 credits
- Health and Wellness (GHW): 3 credits
- Humanities (GH): 6 credits
- Social and Behavioral Sciences (GS): 6 credits
- Natural Sciences (GN): 9 credits

**Integrative Studies (may also complete a Knowledge Domain requirement)**
- Inter-Domain or Approved Linked Courses: 6 credits

**University Degree Requirements**

**First Year Engagement**
All students enrolled in a college or the Division of Undergraduate Studies at University Park, and the World Campus are required to take 1 to 3 credits of the First-Year Seminar, as specified by their college First-Year Engagement Plan.

Other Penn State colleges and campuses may require the First-Year Seminar; colleges and campuses that do not require a First-Year Seminar provide students with a first-year engagement experience.

First-year baccalaureate students entering Penn State should consult their academic adviser for these requirements.

**Cultures Requirement**
6 credits are required and may satisfy other requirements
- United States Cultures: 3 credits
- International Cultures: 3 credits

**Writing Across the Curriculum**
3 credits required from the college of graduation and likely prescribed as part of major requirements.

**Total Minimum Credits**
A minimum of 120 degree credits must be earned for a baccalaureate degree. The requirements for some programs may exceed 120 credits. Students should consult with their college or department adviser for information on specific credit requirements.

**Quality of Work**
Candidates must complete the degree requirements for their major and earn at least a 2.00 grade-point average for all courses completed within their degree program.

**Limitations on Source and Time for Credit Acquisition**
The college dean or campus chancellor and program faculty may require up to 24 credits of course work in the major to be taken at the location or in the college or program where the degree is earned. Credit used toward degree programs may need to be earned from a particular source or within time constraints (see Senate Policy 83-80 (http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#83-80)). For more information, check the Suggested Academic Plan for your intended program.

**Requirements for the Major**
To graduate, a student enrolled in the major must earn a grade of C or better in each course designated by the major as a C-required course, as specified by Senate Policy 82-44 (http://senate.psu.edu/policies-and-rules-for-undergraduate-students/82-00-and-83-00-degree-requirements/#82-44).

**Common Requirements for the Major (All Options)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 110</td>
<td>Chemical Principles I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 111</td>
<td>Experimental Chemistry I</td>
<td>1</td>
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<tr>
<td>FOR 421</td>
<td>Silviculture: Applied Forest Ecology</td>
<td>3</td>
</tr>
<tr>
<td>SOILS 101</td>
<td>Introductory Soil Science</td>
<td>3</td>
</tr>
<tr>
<td>FOR 200</td>
<td>The Profession of Forestry</td>
<td>1</td>
</tr>
<tr>
<td>FOR 203</td>
<td>Field Dendrology</td>
<td>3</td>
</tr>
<tr>
<td>FOR 255</td>
<td>GPS and GIS Applications for Natural Resources Professionals</td>
<td>3</td>
</tr>
<tr>
<td>FOR 266</td>
<td>Forest Resources Measurements</td>
<td>4</td>
</tr>
<tr>
<td>FOR 308</td>
<td>Forest Ecology</td>
<td>3</td>
</tr>
</tbody>
</table>

**Additional Courses**
Select one of the following:
- AGBM 101 Economic Principles of Agribusiness Decision Making | 3 |
- ECON 102 Introductory Microeconomic Analysis and Policy | 3 |
- ECON 104 Introductory Macroeconomic Analysis and Policy | 3 |

**Additional Courses: Require a grade of C or better**
- ENGL 202C or ENGL 202D Effective Writing: Technical Writing or Business Writing | 3 |
- Select one of the following: | 3-4 |
  - STAT 200 Elementary Statistics |
  - STAT 240 Introduction to Biometry |
  - STAT 250 Introduction to Biostatistics |

**Requirements for the Option**
Select an option 55-66

**Requirements for the Option**

**Forest Biology Option (57-58 credits)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 110</td>
<td>Biology: Basic Concepts and Biodiversity</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 220W</td>
<td>Biology: Populations and Communities</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 202</td>
<td>Fundamentals of Organic Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>FOR 204</td>
<td>Dendrology</td>
<td>2</td>
</tr>
<tr>
<td>FOR 409</td>
<td>Tree Physiology</td>
<td>2</td>
</tr>
<tr>
<td>FOR 410</td>
<td>Elements of Forest Ecosystem Management</td>
<td>3</td>
</tr>
<tr>
<td>FOR 430</td>
<td>Conservation Biology</td>
<td>3</td>
</tr>
<tr>
<td>FOR 450W</td>
<td>Human Dimensions of Natural Resources</td>
<td>3</td>
</tr>
<tr>
<td>HORT 445</td>
<td>Plant Ecology</td>
<td>3</td>
</tr>
<tr>
<td>SOILS 102</td>
<td>Introductory Soil Science Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>WFS 209</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>
Prescribed Courses: Require a grade of C or better

FOR 350  Forest Ecosystem Monitoring and Data Analysis  3

Additional Courses
Select 4-5 credits from the following:  4-5

ENT 313  Introduction to Entomology
FOR 403  Invasive Forest Plants: Identification, Ecology, and Management
PPEM 318  Diseases of Forest and Shade Trees

Additional Courses: Require a grade of C or better

MATH 110  Techniques of Calculus I  4
or MATH 140  Calculus With Analytic Geometry I

Supporting Courses and Related Areas
Select 15 credits from department list in consultation with adviser  15

Forest Management Option (57-60 credits)

Code  Title  Credits
Prescribed Courses
ENT 313  Introduction to Entomology  2
FOR 204  Dendrology  2
FOR 440  Forest and Conservation Economics  3
FOR 470  Watershed Management  3
FOR 480  Policy and Administration  3
PPEM 318  Diseases of Forest and Shade Trees  2
WFS 209  3

Prescribed Courses: Require a grade of C or better

FOR 320  Forest Fire Management  2
FOR 350  Forest Ecosystem Monitoring and Data Analysis  3
FOR 455  Remote Sensing and Spatial Data Handling  3
FOR 466W  Forest Management and Planning  3

Additional Courses
BIOL 110  Biology: Basic Concepts and Biodiversity  3-4
or BIOL 127  Introduction to Plant Biology

FOR 401  Urban Forest Management  3
or FOR 450W  Human Dimensions of Natural Resources
FOR 410  Elements of Forest Ecosystem Management  3
or FOR/WFS  Conservation Biology  430

Select one of the following:  3

FOR 409  Tree Physiology
& SOILS 102  and Introductory Soil Science Laboratory
ERM 448  Rural Road Ecology and Maintenance
FOR 439  Timber Sale Administration
FOR 475  Principles of Forest Soils Management

Additional Courses: Require a grade of C or better

Select one of the following:  4-6

MATH 22  College Algebra II and Analytic Geometry
& MATH 33  and Mathematics for Sustainability
MATH 22  College Algebra II and Analytic Geometry
& MATH 34  and The Mathematics of Money
MATH 22  College Algebra II and Analytic Geometry
& AGBM 106  and Agribusiness Problem Solving
MATH 110  Techniques of Calculus I
MATH 140  Calculus With Analytic Geometry I

Supporting Courses and Related Areas

In consultation with adviser, select 12 credits from department list approved for the option. Six credits must be 300-to 400-level.

Community and Urban Forest Management Option (62-66 credits)

Code  Title  Credits
Prescribed Courses
ENT 313  Introduction to Entomology  2
ENT 314  Management of Insect Pests of Ornamentals  1
FOR 480  Policy and Administration  3
GEOG 430  Human Use of Environment  3
HORT 138  Ornamental Plant Materials  3
HORT 301  Principles of Arboriculture  3
HORT 408  Landscape Plant Establishment and Maintenance  4
PLANT 217  Landscape Soil and Water Management  3
PPEM 318  Diseases of Forest and Shade Trees  2

Prescribed Courses: Require a grade of C or better

FOR 204  Dendrology  2
FOR 401  Urban Forest Management  3
FOR 450W  Human Dimensions of Natural Resources  3

Additional Courses
BIOL 110  Biology: Basic Concepts and Biodiversity  3-4
or BIOL 127  Introduction to Plant Biology

Select one of the following:  3

ARCH 316  Analysis of Human Settlements: Cities
LARCH 60  Cultural History of Designed Places
LARCH 65  Built Environment and Culture: Examining the Modern City

Select one of the following:  3

RPTM 320  Recreation Resource Planning and Management
RPTM 325  Principles of Environmental Interpretation
RPTM 435  Recreation Facilities Planning and Management
RPTM 470  Recreation and Park Management

Select one of the following:  3

FOR 455  Remote Sensing and Spatial Data Handling
GEOG 363  Geographic Information Systems
SOILS 450  Environmental Geographic Information Systems

Select one of the following:  3

FOR 409  Tree Physiology
& SOILS 102  and Introductory Soil Science Laboratory
ERM 448  Rural Road Ecology and Maintenance
FOR 439  Timber Sale Administration
FOR 475  Principles of Forest Soils Management

Additional Courses: Require a grade of C or better

FOR 495  Forestry Internship  3
or FOR 496  Independent Studies

Select one of the following:  4-6

MATH 22  College Algebra II and Analytic Geometry
& MATH 33  and Mathematics for Sustainability
MATH 22  College Algebra II and Analytic Geometry
& MATH 34  and The Mathematics of Money
MATH 22  College Algebra II and Analytic Geometry
& AGBM 106  and Agribusiness Problem Solving
MATH 110  Techniques of Calculus I
MATH 140  Calculus With Analytic Geometry I
## Supporting Courses and Related Areas
Select 8-9 credits from department list in consultation with adviser 8-9

### Watershed Management Option (55-59 credits)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOR 450W</td>
<td>Human Dimensions of Natural Resources</td>
<td>3</td>
</tr>
</tbody>
</table>

Prescribed Courses: Require a grade of C or better
- FOR 470: Watershed Management 3
- FOR 471: Watershed Management Laboratory 1

### Additional Courses
Select one of the following: 3
- FOR 409: Tree Physiology
- & SOILS 102: Introductory Soil Science Laboratory
- ERM 448: Rural Road Ecology and Maintenance
- FOR 439: Timber Sale Administration
- FOR 475: Principles of Forest Soils Management

Additional Courses: Require a grade of C or better
- MATH 110: Techniques of Calculus I 4
  - or MATH 140: Calculus With Analytic Geometry I 4
- MATH 111: Techniques of Calculus II 2-4
  - or MATH 141: Calculus with Analytic Geometry II 2-4

### Supporting Courses and Related Areas
Select 6 credits of GS social sciences from the following: 6
- EBF 200: Introduction to Energy and Earth Sciences Economics
- ECON 302: Intermediate Microeconomic Analysis
- EGEE 211: Social Legacy of Pennsylvania Coal
- ENVST 100: \[\text{Course title}\]
- GEOG 20: Human Geography: An Introduction
- GEOG 30N: Environment and Society in a Changing World
- GEOG 160: Mapping Our Changing World
- PLSC 1: American Politics: Principles, Processes and Powers
- PLSC 135: \[\text{Course title}\]

Select 6 credits of physical sciences from the following: 6
- EARTH 100: Environment Earth
- EARTH 103: \[\text{Course title}\]
- EARTH 111: Water: Science and Society
- GEOG 10: Physical Geography: An Introduction
- GEOG 110: Climates of the World
- GEOSC 1: Physical Geology
- GEOSC 10: Geology of the National Parks
- GEOSC 40: The Sea Around Us
- METEO 3: Introductory Meteorology
- METEO 122: Atmospheric Environment: Growing in the Wind
- MICRB 106: Elementary Microbiology
- MICRB 201: Introductory Microbiology

Select 6-8 credits of GN from the following: 6-8
- PHYS 1: The Science of Physics
- PHYS 150: Technical Physics I
- PHYS 151: Technical Physics II
- PHYS 211: General Physics: Mechanics

Select 3 credits in geospatial analysis from the following: 3
- FOR 455: Remote Sensing and Spatial Data Handling
- GEOG 362: Image Analysis
- GEOG 363: Geographic Information Systems
- GEOG 364: Spatial Analysis
- SOILS 450: Environmental Geographic Information Systems

Select 6 credits of resources management from the following: 6
- ASM 327: Soil and Water Resource Management
- CED 201: Introductory Environmental and Resource Economics
- CED 327: Environment and Society
- CED 429: Natural Resource Economics
- CED 431W: Economic Analysis of Environmental and Resource Policies
- CED 450: International Development, Renewable Resources, and the Environment
- ERM 411: Legal Aspects of Resource Management
- ERM 412: Resource Systems Analysis
- ERM 413W: Case Studies in Ecosystem Management
- FOR 410: Elements of Forest Ecosystem Management
- FOR 440: Forest and Conservation Economics
- GEOG 411W: Forest Geography
- GEOG 430: Human Use of Environment
- GEOG 431: Geography of Water Resources
- SOILS 422: Natural Resources Conservation and Community Sustainability

Select 9 credits of water sciences (3 credits must be at the 400-level) from the following: 9
- ASM 309: Measurement & Monitoring of Hydrologic Systems
- CE 360: Fluid Mechanics
- CE 370: Introduction to Environmental Engineering
- CE 371: Water and Wastewater Treatment
- ENVE 411: Water Supply and Pollution Control
- ENVE 415: Hydrology
- ENVE 408: Contaminant Hydrology
- ERM 435: Limnology
- ERM 447: Stream Restoration
- ERM 450: Wetland Conservation
- GEOG 310: Introduction to Global Climatic Systems
- GEOG 311: Landscape Ecology
- GEOG 412W: Climatic Change and Variability
- GEOSC 412: Water Resources Geochemistry
- GEOSC 413W: Techniques in Environmental Geochemistry
- GEOSC 440: Marine Geology
- GEOSC 452: Hydrogeology
- METEO 451: Introduction to Physical Oceanography
- METEO 454: Introduction to Micrometeorology
- SOILS 405: Hydropedology
Program Learning Objectives

1. Demonstrate knowledge of the biology, taxonomy, and ecology of flora and fauna associated with forested ecosystems.
   - Identify the common tree species of North America (especially those of the northeastern US) and describe their silvics.
   - Identify key understory plants, invasive species, pathogens, non-timber forest products, and fauna and describe their ecological roles in forest ecosystems.
   - Recognize features that affect forest ecosystems such as soils, climate, disturbance, and land use history.

2. Accurately identify, measure and quantify a variety of forest ecosystem attributes.
   - Design, execute, analyze and report on a forest inventory to measure both timber and non-timber attributes.
   - Demonstrate proficiency with a specified set of field equipment.
   - Design and implement a plan to monitor key ecosystem resources and processes.

3. Communicate effectively with diverse groups through listening, speaking and writing.
   - Communicate clearly through e-mail, letters and other forms of professional correspondence.
   - Effectively present complex information in different formats to a variety of audiences.
   - Use geographical information systems (GIS) to create a map showing features such as buffer zones on streams or roads or the layout of a timber sale.
   - Conduct a clear dialog with a potential client to determine their needs.
   - Use appropriate methods of communicating with diverse groups.
   - Apply conflict resolution skills for consensus building, facilitation and negotiation.

4. Apply science-based knowledge to select, obtain, analyze and interpret natural resources information in an ecological, economic and social context.
   - Acquire data from primary and secondary sources to describe and analyze ecological, economic and social relationships on both spatial and temporal scales.
   - Use a geographical positioning system (GPS) to map features such as a hiking trail.
   - Find relevant natural resources information, such as publicly available data sets, research reports, and management plans.
   - Critically analyze the evidence on multiple sides of a contemporary natural resources issue.
   - Assess the economic, social, and ecological opportunities and constraints of a given land parcel within a relevant spatial and temporal context and recognize appropriate and defensible land management objectives.
   - Identify and evaluate the full range – ecological, social, and economic – of impacts of different forest management alternatives.
   - Apply economic, financial and business management tools to assess alternative forest management activities.

5. Recognize, identify, and integrate the relevant ecological, economic, and societal aspects of contemporary problems in natural resources management and use this understanding to develop, support and implement effective solutions.
   - Based on an assessment of a property, develop, write and present a management plan, including silvicultural prescriptions, for the property that meet the stated land management objectives and implement the components of the plan.
   - Describe the role of institutions such as markets, communities, governments, and non-government organizations in the management of natural resources.
   - Describe and evaluate how a contemporary natural resources issue has been addressed by society.
   - Identify a natural resources problem, evaluate the science and the politics behind the problem, engage the stakeholders involved, and propose a solution to the problem.

6. Synthesize knowledge, diverse values, and ethics for making, communicating and supporting decisions with confidence, respect, professionalism, and compassion.
   - Demonstrate openness, tolerance, and appreciation for alternative points of view.
   - Demonstrate awareness of global issues and cultural diversity.
   - Be able to present and conduct oneself as a professional.

Academic Advising

The objectives of the university’s academic advising program are to help advisees identify and achieve their academic goals, to promote their intellectual discovery, and to encourage students to take advantage of both in-and out-of-class educational opportunities in order that they become self-directed learners and decision makers.

Both advisers and advisees share responsibility for making the advising relationship succeed. By encouraging their advisees to become engaged in their education, to meet their educational goals, and to develop the habit of learning, advisers assume a significant educational role. The advisee’s unit of enrollment will provide each advisee with a primary academic adviser, the information needed to plan the chosen program of study, and referrals to other specialized resources.

READ SENATE POLICY 32-00: ADVISING POLICY (http://senate.psu.edu/policies-and-rules-for-undergraduate-students/32-00-advising-policy/)

University Park
Ellen A. Rom
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University Park, PA 16802
814-863-0362
exr2@psu.edu

Suggested Academic Plan

The suggested academic plan(s) listed on this page are the plan(s) that are in effect during the 2020-21 academic year. To access previous years’ suggested academic plans, please visit the archive (http://bulletins.psu.edu/undergraduate/archive/) to view the appropriate Undergraduate Bulletin edition (Note: the archive only contain suggested academic plans beginning with the 2018-19 edition of the Undergraduate Bulletin).

Forest Biology Option, University Park Campus

The course series listed below provides only one of the many possible ways to move through this curriculum. The University may make changes
in policies, procedures, educational offerings, and requirements at any time. This plan should be used in conjunction with your degree audit (accessible in LionPATH as either an Academic Requirements or What If report). Please consult with a Penn State academic adviser on a regular basis to develop and refine an academic plan that is appropriate for you.

### First Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>First-Year Seminar</td>
<td>1-3</td>
<td>AGBM 101, ECON 102, or ECON 104</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 110†</td>
<td>4</td>
<td>CHEM 110†</td>
<td>3</td>
</tr>
<tr>
<td>MATH 110 or 140‡ ‡</td>
<td>4</td>
<td>CHEM 111‡</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 15 or 30‡ ‡</td>
<td>3</td>
<td>STAT 200, 240, or 250‡ ‡</td>
<td>3-4</td>
</tr>
<tr>
<td>General Education Course †</td>
<td>3</td>
<td>CAS 100‡ ‡</td>
<td>3</td>
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<tr>
<td>WFS 209</td>
<td></td>
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### Second Year

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<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
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<tbody>
<tr>
<td>FOR 200*</td>
<td>1</td>
<td>FOR 204</td>
<td>2</td>
</tr>
<tr>
<td>FOR 203*</td>
<td>3</td>
<td>FOR 266*</td>
<td>4</td>
</tr>
<tr>
<td>FOR 255*</td>
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<td>CHEM 202</td>
<td>3</td>
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<tr>
<td>BIOL 220W</td>
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<td>SOILS 101†</td>
<td>3</td>
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<tr>
<td>General Education Course †</td>
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<td>SOILS 102</td>
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### Third Year

<table>
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<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>FOR 308*</td>
<td>3 ENT 313, FOR 403, or PPEM 318 (need 2)</td>
<td>2-3</td>
<td></td>
</tr>
<tr>
<td>ENGL 202C or 202D‡ ‡</td>
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<td>FOR 350*</td>
<td>3</td>
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<td>FOR/WFS 430</td>
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<td>FOR 409</td>
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<tr>
<td>Supporting Course Selection from List</td>
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<td>FOR 410</td>
<td>3</td>
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<tr>
<td>General Education Course †</td>
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<td>General Education Course (GHW)</td>
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### Fourth Year

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<tr>
<td>FOR 421</td>
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<td>2-3</td>
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<tr>
<td>HORT 445</td>
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<td>FOR 450W</td>
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<tr>
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<tr>
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<tr>
<td></td>
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<td>12-15</td>
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</table>

Total Credits 119-126

* Course requires a grade of C or better for the major
† Course requires a grade of C or better for General Education
‡ Course satisfies General Education and degree requirement
†† Refer to your degree audit to determine which General Education requirements need yet to be fulfilled.

### University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy University Requirements (United States and International Cultures). W, M, X, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.

GWS, GQ, GHW, GN, GA, GH, and GS are abbreviations used to identify General Education program courses. General Education includes Foundations (GWS and GQ) and Knowledge Domains (GHW, GN, GA, GH, GS, and Integrative Studies). Foundations courses (GWS and GQ) require a grade of ‘C’ or better.

Integrative Studies courses are required for the General Education program. N is the suffix at the end of a course number used to designate an Inter-Domain course and Z is the suffix at the end of a course number used to designate a Linked course.

All incoming Schreyer Honors College first-year students at University Park will take ENGL/CAS 137 in the fall semester and ENGL/CAS 138 in the spring semester. These courses carry the GWS designation and replace both ENGL 30 and CAS 100. Each course is 3 credits.

### Advising Notes:

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- All Supporting Course selections are listed in the FOREM Handbook, which is available on the department’s website (http://ecosystems.psu.edu), under Student Resources, Student Handbooks.
- Many FOR classes are offered only once per year, in the fall or the spring: plan your schedule accordingly.
- FOR 409 is offered only in spring of odd years.
- Courses that are listed as both US or IL and GA, GH, or GS can count for both requirements (i.e., a course listed for both GA and IL will satisfy both Arts and International Cultures).
- Students should monitor their academic progress by checking their degree audits on LionPATH.
- Questions about FOREM academic plans or degree audits should be directed to academic advisers or to FOREM Program Coordinator Ellen Rom, exr2@psu.edu or 814-863-0362.

### Forest Biology Option, Commonwealth Campuses

The course series listed below provides only one of the many possible ways to move through this curriculum. The University may make changes in policies, procedures, educational offerings, and requirements at any time. This plan should be used in conjunction with your degree audit (accessible in LionPATH as either an Academic Requirements or What If report). Please consult with a Penn State academic adviser on a regular basis to develop and refine an academic plan that is appropriate for you.
### University Requirements and General Education Notes:

- **US and IL are abbreviations used to designate courses that satisfy University Requirements (United States and International Cultures).**
- **W, M, X, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.**
- **GWS, GQ, GHW, GN, GA, GH, GS, and Integrative Studies** are abbreviations used to identify General Education program courses. General Education includes Foundations (GWS and GQ) and Knowledge Domains (GHW, GN, GA, GH, GS, and Integrative Studies). Foundations courses (GWS and GQ) require a grade of ‘C’ or better.
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### Advising Notes:

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- FOR 409 is offered only in spring of odd years.
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### Forest Management Option, University Park Campus and Commonwealth Campuses

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### First Year

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### Second Year

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<td>FOR 203 *</td>
<td>3 FOR 266 *</td>
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<td>FOR 255 *</td>
<td>3 CHEM 202</td>
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<td>3 ENGL 202C or 202D †</td>
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<td>SOILS 102</td>
<td>1 AGBM 101, ECON 102, or ECON 104 †</td>
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<td>WFS 209</td>
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### Third Year

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<th>Spring</th>
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<td>3 ENT 313, FOR 403, or PPEM 318 (need 2)</td>
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<tr>
<td>FOR/WFS 430 *</td>
<td>3 FOR 350 †</td>
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### Fourth Year

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<td>HORT 445</td>
<td>3 FOR 450 W</td>
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<td>15</td>
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</table>

**Total Credits 119-126**

- † Course requires a grade of C or better for the major
- ‡ Course requires a grade of C or better for General Education
- # Course is an Entrance to Major requirement
- † † Course satisfies General Education and degree requirement
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General Education Courses

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<tr>
<th>Fall</th>
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<th>Spring</th>
<th>Credits</th>
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<td>FOR 203*</td>
<td>3 FOR 266†</td>
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<tr>
<td>FOR 255*</td>
<td>3 PPEM 318</td>
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<tr>
<td>SOILS 101†</td>
<td>3 ENT 313</td>
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<td>General Education Course 1</td>
<td>3 ENGL 202C or 202D‡‡</td>
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<td>General Education Course 1 (GHW)</td>
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14-19 | 16-17 |

Second Year

Fall | Credits | Spring | Credits |
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<td>FOR 320*</td>
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<td>FOR 440</td>
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<td>FOR 350†</td>
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<tr>
<td>FOR 401 (or Supporting Course) 2</td>
<td>3 WFS 209</td>
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<tr>
<td>General Education Course 1</td>
<td>3 FOR 450W 2</td>
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<tr>
<td>Elective</td>
<td>2 FOR 455*</td>
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General Education Course (GHW) | 1.5 | 3 |

14 | 16 |

Third Year

Fall | Credits | Spring | Credits |
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<td>3 FOR 409 &amp; SOILS 102 (or Supporting Course) 2</td>
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<td>FOR 421</td>
<td>3 FOR 466W*</td>
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<td>FOR/WFS 430 2</td>
<td>3 FOR 410 2</td>
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<td>Supporting Course</td>
<td>3 FOR 470</td>
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<td>0-4 FOR 480</td>
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| 12-16 | 15 |

Fourth Year

Fall | Credits | Spring | Credits |
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<td>3 FOR 409 &amp; SOILS 102 (or Supporting Course) 2</td>
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<tr>
<td>FOR 421</td>
<td>3 FOR 466W*</td>
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<td>FOR/WFS 430 2</td>
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<td>Supporting Course</td>
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<td>0-4 FOR 480</td>
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| 12-16 | 15 |

Total Credits 117-127

* Course requires a grade of C or better for the major
† Course requires a grade of C or better for General Education
# Course is an Entrance to Major requirement
‡ Course satisfies General Education and degree requirement

1 Refer to your degree audit to determine which General Education requirements need yet to be fulfilled.
2 Refer to FOREM FMGT checksheet and your degree audit for clarification about how FOR 401, FOR 450W, FOR 475, FOR 409, and SOILS 102 satisfy degree requirements.

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- Refer to both the FOREM FMGT Supporting Course list and the FOREM FMGT checksheet in the FOREM Handbook for clarification about how FOR 401, FOR 450W, FOR 475, FOR 409, and SOILS 102 satisfy degree requirements in the FMGT option.
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- FOR 409 is offered only in spring of odd years.
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Community and Urban Forestry Management Option, University Park Campus and Commonwealth Campuses

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First Year

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<th>Spring</th>
<th>Credits</th>
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<tr>
<td>MATH 22 and MATH 33, or MATH 22 and MATH 34, or MATH 22 and AGBM 106, or MATH 110, or MATH 140  2  1</td>
<td>4-6 CHEM 110†</td>
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<td>BIOL 110 or 127†</td>
<td>3-4 CHEM 111†</td>
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<td>ENGL 15 or 30††</td>
<td>3 AGBM 101, ECON 102, or ECON 104††</td>
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</table>
**Total Credits 120-131**

* Course requires a grade of C or better for the major
† Course requires a grade of C or better for General Education
# Course is an Entrance to Major requirement
‡ Course satisfies General Education and degree requirement
1 Refer to your degree audit to determine which General Education requirements need yet to be fulfilled.
2 Refer to FOREM CURFM checksheet and your degree audit for clarification about how ERM 448, FOR 439, FOR 475, FOR 409, SOILS 102, and Supporting Courses satisfy degree requirements.

**Watershed Management Option, University Park Campus and Commonwealth Campuses**

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**First Year**

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**Second Year**

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<th>Spring</th>
<th>Credits</th>
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<td>FOR 203*</td>
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<td>FOR 255*</td>
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<td>HORT 301</td>
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<td>SOILS 101†</td>
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<td>LARCH 60, 65, or ARCH 316†</td>
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| Total Credits         | 14-19   | 16-17                   |

**Third Year**

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<td>HORT 138</td>
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<td>PLANT 217</td>
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| Total Credits         | 15      | 14-19                   |

**Fourth Year**

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<td>General Education Course (GHW)</td>
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| Total Credits         | 15      | 16.5                    |

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**Advising Notes:**

- Students should be aware that, in most cases, completion of the Forest Ecosystem Management (FOREM) degree in eight semesters requires enrollment at Penn State University Park beginning the fall semester of the sophomore year.
- All Supporting Course selections are listed in the FOREM Handbook, which is available on the department’s website (http://ecosystems.psu.edu), under Student Resources, Student Handbooks.
- Many FOR classes are offered only once per year, in the fall or the spring; plan your schedule accordingly.
- FOR 409 is offered only in spring of odd years.
- Courses that are listed as both US or IL and GA, GH, or GS can count for both requirements (i.e., a course listed for both GA and IL will satisfy both Arts and International Cultures).
- Students should monitor their academic progress by checking their degree audits on LionPATH.
- Questions about FOREM academic plans or degree audits should be directed to academic advisers or to FOREM Program Coordinator Ellen Rom, exr2@psu.edu or 814-863-0362.

1 Use this Suggested Academic Plan in consultation with your degree audit. SOILS 102 and Supporting Courses are not C-required.
### Second Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td></td>
</tr>
<tr>
<td>FOR 200*</td>
<td>4</td>
</tr>
<tr>
<td>FOR 203†</td>
<td>3</td>
</tr>
<tr>
<td>FOR 255†</td>
<td>3-4</td>
</tr>
<tr>
<td>SOILS 101†</td>
<td>3</td>
</tr>
<tr>
<td>General Education Course 1</td>
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### Third Year

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
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<tr>
<td>FOR 308*</td>
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</tr>
<tr>
<td>ERM 448, FOR 439, or FOR 475 (or Geospatial Analysis Selection from List)†‡</td>
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<tr>
<td>PHYS GN Selection from List†</td>
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<tr>
<td>Resources Management Selection from List</td>
<td>3</td>
</tr>
<tr>
<td>Water Sciences Selection from List</td>
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<td>General Education Course (GHW)</td>
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### Fourth Year

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<tr>
<td>FOR 421</td>
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<tr>
<td>Physical Sciences Selection from List</td>
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</tr>
<tr>
<td>Water Sciences Selection from List</td>
<td>3</td>
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<tr>
<td>General Education Course 1</td>
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</tr>
<tr>
<td>Elective</td>
<td>3-6</td>
</tr>
</tbody>
</table>

### Total Credits

116-128

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* Course requires a grade of C or better for the major
† Course requires a grade of C or better for General Education
‡ Course is an Entrance to Major requirement
† Course satisfies General Education and degree requirement
‡† Refer to your degree audit to determine which General Education requirements need yet to be fulfilled.

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### Career Paths

Graduates become forest managers responsible for the flora and fauna on publicly owned forests and watersheds, including national and state forests and parks, game lands, and recreation areas. Others work as ecologists studying environmental factors that affect forests, or as consultants surveying timberlands and recommending harvest and reforestation practices. Graduates also work as community foresters managing urban trees and green spaces, consulting foresters assisting private landowners, industrial foresters ensuring a company’s need for raw materials, and land managers for conservation organizations.
and watershed managers responsible for the protection of municipal watersheds. The curriculum also provides a firm base for graduate study.

**Careers**
Graduates of the Forest Management and Forest Biology options may be employed by public agencies such as the Pennsylvania Bureau of Forestry and the U.S. Forest Service, nonprofit organizations such as The Nature Conservancy, industries such as sawmills and bioenergy facilities, and environmental consulting firms. Graduates of the Community and Urban Forest Management option may be employed by municipalities, arboricultural companies, utilities, and government agencies to manage community trees and green spaces. Graduates of the Watershed Management option may find federal employment as hydrologists or pursue careers in municipal watershed management and in environmental/engineering consulting.

MORE INFORMATION ABOUT POTENTIAL CAREER OPTIONS FOR GRADUATES OF THE FOREST ECOSYSTEM MANAGEMENT PROGRAM (http://ecosystems.psu.edu/majors/forest-ecosystem-management/careers/)

MORE INFORMATION ABOUT OPPORTUNITIES FOR GRADUATE STUDIES (http://ecosystems.psu.edu/graduateprograms/forest-resources/)

**Professional Resources**
- Society of American Foresters (http://www.eforester.org)

**Accreditation**
Three options of the Forest Ecosystem Management baccalaureate degree program (Community and Urban Forest Management, Forest Biology, and Forest Management) are accredited by the Society of American Foresters. Degrees in forestry have been awarded at Penn State since 1907, and our program was among those first accredited by the Society of American Foresters in 1935.

MORE INFORMATION ABOUT THE SOCIETY OF AMERICAN FORESTERS (http://www.eforester.org/)

**Contact**
**University Park**
DEPARTMENT OF ECOSYSTEM SCIENCE AND MANAGEMENT
Undergraduate Programs Office
113 Forest Resources Building
University Park, PA 16802
814-865-4237

https://ecosystems.psu.edu