FOREST ECOSYSTEM MANAGEMENT, B.S.

Begin Campus: Any Penn State Campus

End Campus: University Park

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 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 GG 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 (https://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>
</tr>
<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>
</tbody>
</table>

Prescribed Courses: Require a grade of C or better

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<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>
</tbody>
</table>


### Additional Courses

Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGBM 101</td>
<td>Economic Principles of Agribusiness Decision Making</td>
<td>3</td>
</tr>
<tr>
<td>ECON 102</td>
<td>Introductory Microeconomic Analysis and Policy</td>
<td></td>
</tr>
<tr>
<td>ECON 104</td>
<td>Introductory Macroeconomic Analysis and Policy</td>
<td></td>
</tr>
</tbody>
</table>

**Additional Courses: Require a grade of C or better**

- ENGL 202C: Effective Writing: Technical Writing (3 credits)
- ENGL 202D: Effective Writing: Business Writing (3 credits)

Select one of the following: 3-4 credits

- STAT 200: Elementary Statistics
- STAT 240: Introduction to Biometry
- STAT 250: Introduction to Biostatistics

### 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 209N</td>
<td>Wildlife and Fisheries Conservation</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 credits)

**Additional Courses**

Select 4-5 credits from the following:

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

**Supporting Courses and Related Areas**

Select 15 credits from department list in consultation with adviser

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

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

**Prescribed Courses: Require a grade of C or better**

- FOR 204: Dendrology
- FOR 401: Urban Forest Management
- FOR 450: Dendrology
- FOR 450W: Human Dimensions of Natural Resources
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 409  & SOILS 102  Tree Physiology 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

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

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  Human Geography: An Introduction
GEOG 10  Physical Geography: An Introduction
GEOG 110  Climates of the World
GEOG 160  Physical Geology
GEOG 10  Geology of the National Parks
GEOG 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
PHYS 213  General Physics: Fluids and Thermal Physics
PHYS 250  Introductory Physics I
PHYS 251  Introductory Physics II

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

Watershed Management Option (55-59 credits)

Code  Title  Credits

Prescribed Courses
FOR 450W  Human Dimensions of Natural Resources 3

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

Additional Courses
MATH 111  Techniques of Calculus II 2-4
or MATH 141  Calculus with Analytic Geometry II

Select one of the following: 3

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

Supporting Courses and Related Areas
Select 8-9 credits from department list In consultation with adviser 8-9

Code  Title

Prescribed Courses

Additional Courses

Select one of the following:

FOR 409  & SOILS 102  Tree Physiology 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

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

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  Human Geography: An Introduction
GEOG 10  Physical Geography: An Introduction
GEOG 110  Climates of the World
GEOG 160  Physical Geology
GEOG 10  Geology of the National Parks
GEOG 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
PHYS 213  General Physics: Fluids and Thermal Physics
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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>ERM 411</td>
<td>Legal Aspects of Resource Management</td>
</tr>
<tr>
<td>ERM 412</td>
<td>Resource Systems Analysis</td>
</tr>
<tr>
<td>ERM 413W</td>
<td>Case Studies in Ecosystem Management</td>
</tr>
<tr>
<td>FOR 410</td>
<td>Elements of Forest Ecosystem Management</td>
</tr>
<tr>
<td>FOR 440</td>
<td>Forest and Conservation Economics</td>
</tr>
<tr>
<td>GEOG 411W</td>
<td>Forest Geography</td>
</tr>
<tr>
<td>GEOG 430</td>
<td>Human Use of Environment</td>
</tr>
<tr>
<td>GEOG 431</td>
<td>Geography of Water Resources</td>
</tr>
<tr>
<td>SOILS 422</td>
<td>Natural Resources Conservation and Community Sustainability</td>
</tr>
</tbody>
</table>

Select 9 credits of water sciences (3 credits must be at the 400-level)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASM 309</td>
<td>Measurement &amp; Monitoring of Hydrologic Systems</td>
</tr>
<tr>
<td>CE 360</td>
<td>Fluid Mechanics</td>
</tr>
<tr>
<td>CE 370</td>
<td>Introduction to Environmental Engineering</td>
</tr>
<tr>
<td>CE 371</td>
<td>Water and Wastewater Treatment</td>
</tr>
<tr>
<td>ENVE 411</td>
<td>Water Supply and Pollution Control</td>
</tr>
<tr>
<td>ENVE 415</td>
<td>Hydrology</td>
</tr>
<tr>
<td>ENVSE 408</td>
<td>Contaminant Hydrology</td>
</tr>
<tr>
<td>ERM 435</td>
<td>Limnology</td>
</tr>
<tr>
<td>ERM 447</td>
<td>Stream Restoration</td>
</tr>
<tr>
<td>ERM 450</td>
<td>Wetland Conservation</td>
</tr>
<tr>
<td>GEOG 310</td>
<td>Introduction to Global Climatic Systems</td>
</tr>
<tr>
<td>GEOG 311</td>
<td>Landscape Ecology</td>
</tr>
<tr>
<td>GEOG 412W</td>
<td>Climatic Change and Variability</td>
</tr>
<tr>
<td>GEOSC 412</td>
<td>Water Resources Geochemistry</td>
</tr>
<tr>
<td>GEOSC 413W</td>
<td>Techniques in Environmental Geochemistry</td>
</tr>
<tr>
<td>GEOSC 440</td>
<td>Marine Geology</td>
</tr>
<tr>
<td>GEOSC 452</td>
<td>Hydrogeology</td>
</tr>
<tr>
<td>METEO 451</td>
<td>Introduction to Physical Oceanography</td>
</tr>
<tr>
<td>METEO 454</td>
<td>Introduction to Micrometeorology</td>
</tr>
<tr>
<td>SOILS 405</td>
<td>Hydropedology</td>
</tr>
<tr>
<td>WFS 422</td>
<td>Ecology of Fishes</td>
</tr>
</tbody>
</table>

Select 3 additional credits at the 300-to 400-level from the lists above