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 for the Major</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>
### Forest Management Option (57-60 credits)

- **FOR 255** GPS and GIS Applications for Natural Resources Professionals 3
- **FOR 266** Forest Resources Measurements 4
- **FOR 308** Forest Ecology 3

#### Additional Courses

Select one of the following:

- AGBM 101 Economic Principles of Agribusiness Decision Making 3
- ECON 102 Introductory Microeconomic Analysis and Policy
- ECON 104 Introductory Macroeconomic Analysis and Policy

#### Supporting Courses and Related Areas

**MATH 110**  
Additional Courses: Require a grade of C or better

Select one of the following:

- **FOR 350**  
- **FOR 410**  
- **FOR 409**  
- **FOR 430**  
- **FOR 410**  
- **FOR 204**  
- **CHEM 202**  
- **BIOL 220W**  
- **BIOL 110**  

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

Select one of the following:

- **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 209N** Wildlife and Fisheries Conservation 3

#### Additional Courses

Select one of the following:

- **ENGL 202C** Effective Writing: Technical Writing 3
  or **ENGL 202D** Effective Writing: Business Writing 4

Select one of the following:

- **STAT 200** Elementary Statistics 3
- **STAT 240** Introduction to Biometry 3
- **STAT 250** Introduction to Biostatistics 3

#### 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 209N</td>
<td>Wildlife and Fisheries Conservation</td>
<td>3</td>
</tr>
</tbody>
</table>

Prescribed Courses: Require a grade of C or better

Select one of the following:

- **FOR 350** Forest Ecosystem Monitoring and Data Analysis 3

Additional Courses

Select 4-5 credits from the following:

- **ENT 313** Introduction to Entomology 4-5
- **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

### 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>GEG 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>3</td>
</tr>
</tbody>
</table>

Prescribed Courses: Require a grade of C or better

Select one of the following:

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

### Additional Courses

Select 3-4 credits from the following:

- **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

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

BIOL 110  
Biology: Basic Concepts and Biodiversity  
3-4  

or BIOL 127  
Introduction to Plant Biology  

Select one of the following:  

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:  

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:  

FOR 409  
Tree Physiology  
& SOILS 102  
Introduction to 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:  

EBF 200  
Introduction to Energy and Earth Sciences Economics  
ECON 302  
Intermediate Microeconomic Analysis  
EGEE 211  
Social Legacy of Pennsylvania Coal  
ENST 100  
Human Geography: An Introduction  
GEOG 20  
Environment and Society in a Changing World  
GEOG 160  
Mapping Our Changing World  
PLSC 1  
American Politics: Principles, Processes and Powers  
PLSC 135  

Select 6 credits of physical sciences from the following:  

EARTH 100  
Environment Earth  
EARTH 103  
EARTH 111  
Water: Science and Society  
GEOG 10  
Physical Geography: An Introduction  
GEOG 110  
Climates of the World  
GEOG 160  
Geology of the National Parks  
GEOG 40  
The Sea Around Us  
METEO 3  
Weather Revealed: 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:  

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:  

GEOG 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:  

FOR 409  
Tree Physiology  
& SOILS 102  
Introduction to Soil Science Laboratory  
ERM 448  
Rural Road Ecology and Maintenance  
FOR 439  
Timber Sale Administration  
FOR 475  
Principles of Forest Soils Management
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<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) from the following:

<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