

# 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:

Requirement	Credits
General Education	45
Electives	2-11
Requirements for the Major	88-100

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.

## 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)

Code	Title	Credits
<b>Prescribed Courses</b>		
CHEM 110	Chemical Principles I	3
CHEM 111	Experimental Chemistry I	1
FOR 421	Silviculture: Applied Forest Ecology	3
SOILS 101	Introductory Soil Science	3
<i>Prescribed Courses: Require a grade of C or better</i>		
FOR 200	The Profession of Forestry	1
FOR 203	Field Dendrology	3
FOR 255	GPS and GIS Applications for Natural Resources Professionals	3
FOR 266	Forest Resources Measurements	4
FOR 308	Forest Ecology	3
<b>Additional Courses</b>		
Select one of the following:		3
AGBM 101	Economic Principles of Agribusiness Decision Making	
ECON 102	Introductory Microeconomic Analysis and Policy	
ECON 104	Introductory Macroeconomic Analysis and Policy	

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

ENGL 202C	Effective Writing: Technical Writing	3
or ENGL 202D	Effective Writing: Business Writing	
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
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### Requirements for the Option

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

Code	Title	Credits
<b>Prescribed Courses</b>		
BIOL 110	Biology: Basic Concepts and Biodiversity	4
BIOL 220W	Biology: Populations and Communities	4
CHEM 202	Fundamentals of Organic Chemistry I	3
FOR 204	Dendrology	2
FOR 409	Tree Physiology	2
FOR 410	Elements of Forest Ecosystem Management	3
FOR 430	Conservation Biology	3
FOR 450W	Human Dimensions of Natural Resources	3
HORT 445	Plant Ecology	3
SOILS 102	Introductory Soil Science Laboratory	1
WFS 209N	Wildlife and Fisheries Conservation	3

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

FOR 350	Forest Ecosystem Monitoring and Data Analysis	3
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#### Additional Courses

Select 4-5 credits from the following:	4-5
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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
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### Forest Management Option (57-60 credits)

Code	Title	Credits
<b>Prescribed Courses</b>		
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 209N	Wildlife and Fisheries Conservation	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 430	Conservation Biology	
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	
<i>Additional Courses: Require a grade of C or better</i>		
Select one of the following:		4-6
MATH 22 & MATH 33	College Algebra II and Analytic Geometry and Mathematics for Sustainability	
MATH 22 & MATH 34	College Algebra II and Analytic Geometry and The Mathematics of Money	
MATH 22 & AGBM 106	College Algebra II and Analytic Geometry 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. 12

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

Code	Title	Credits
<b>Prescribed Courses</b>		
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
<i>Prescribed Courses: Require a grade of C or better</i>		
FOR 204	Dendrology	2
FOR 401	Urban Forest Management	3
FOR 450W	Human Dimensions of Natural Resources	3
<b>Additional Courses</b>		
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 & 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	
<i>Additional Courses: Require a grade of C or better</i>		
FOR 495	Forestry Internship	3
or FOR 496	Independent Studies	
Select one of the following:		4-6
MATH 22 & MATH 33	College Algebra II and Analytic Geometry and Mathematics for Sustainability	
MATH 22 & MATH 34	College Algebra II and Analytic Geometry and The Mathematics of Money	
MATH 22 & AGBM 106	College Algebra II and Analytic Geometry 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)**

Code	Title	Credits
<b>Prescribed Courses</b>		
FOR 450W	Human Dimensions of Natural Resources	3
<i>Prescribed Courses: Require a grade of C or better</i>		
FOR 470	Watershed Management	3
FOR 471	Watershed Management Laboratory	1
<b>Additional Courses</b>		
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	
<i>Additional Courses: Require a grade of C or better</i>		
MATH 110	Techniques of Calculus I	4
or MATH 140	Calculus With Analytic Geometry I	
<b>Supporting Courses and Related Areas</b>		
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		
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		
Select 6 credits of physical sciences from the following:		6
EARTH 100	Environment Earth	
EARTH 103		
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	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:		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	
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
ENVSE 408	Contaminant Hydrology
ERM 435	Limnology
ERM 447	Stream Restoration
ERM 450	Wetland Conservation
GEOG 310	Introduction to Global Climatic Systems
GEOG 311	
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
WFS 422	Ecology of Fishes

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

## 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.