

# ENVIRONMENTAL SCIENCE AND SUSTAINABILITY B.S. - ECOSYSTEM SCIENCE AND RESTORATION

The Ecosystem Science and Restoration concentration spans the range of ecology from microbial to global scales and includes basic and applied science. Students will focus on learning about how ecosystems work, solving pressing environmental problems, and/or helping to restore degraded ecosystems. In the ESR concentration, students can focus on either aquatic or terrestrial ecosystems and tailor their capstone experience to best fit their interests and career path.

## Bachelor of Science - Environmental Science and Sustainability; Ecosystem Science and Restoration Concentration General Education Requirements

Information regarding these requirements can be found in the General Education Section (<http://catalog.umt.edu/academics/general-education-requirements/>) of the catalog.

### Summary

Code	Title	Hours
Lower-Division Required Courses		17-19
<b>Ecosystem Science and Restoration Concentration Requirements</b>		
Lower-Division Required Courses		26-27
Upper-Division Required Courses		21-23
ESR Natural Science Electives		9
Ethics		3
Policy		3
Social Science		3
Advanced Writing Requirement		
<b>Total Hours</b>		<b>82-87</b>

Degree Specific Credits: 82-87

Required Cumulative GPA: 2.0

### Lower-Division Required Courses

**Note:** NRSM 110 will not be required if students declare the major with 60+ credits.

Code	Title	Hours
<b>Complete the following courses:</b>		
NRSM 110	First Year Seminar in Environmental Science and Sustainability	1
NRSM 121S	Environmental Science and Sustainability	3
<b>Complete one of the following:</b>		<b>3-4</b>

GPHY 111N Intro to Physical Geography: Climate, & GPHY 112N Landforms, and Vegetation and Intro to Physical Geography Laboratory: Climate, Landforms, and Vegetation

NRSM 211N Soils and Water & NRSM 212N and Ecology, Physics and Taxonomy of Soils

### Oral Communication - Complete one of the following courses:

COMX 111A	Introduction to Public Speaking	3
or THTR 120A	Introduction to Acting I	

### Statistics Requirement - Complete one of the following courses:

FORS 201	Forest Biometrics	
STAT 216	Introduction to Statistics	
WILD 240	Intro to Biostatistics	

### Chemistry - Complete the following course:

CHMY 121N	Introduction to General Chemistry	4
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**Total Hours** 17-19

Minimum Required Grade: C-

## Ecosystem Science and Restoration Concentration Requirements

**Rule:** Complete all of the following subcategories.

### Lower-Division Required Courses

Code	Title	Hours
<b>Complete all of the following courses:</b>		
BIOB 160N	Principles of Living Systems	3
BIOB 161N	Principles of Living Systems Lab	1
BIOB 260	Cellular and Molecular Biology	4
BIOB 272	Genetics and Evolution	4
CHMY 123	Introduction to Organic and Biochemistry	4
M 162	Applied Calculus	4
NRSM 265	Elements of Ecological Restoration	3
<b>Complete one of the following:</b>		<b>3-4</b>
GEO 101N & GEO 102N	Introduction to Physical Geology and Introduction to Physical Geology Lab	
GEO 103N & GEO 104N	Introduction to Environmental Geology and Introduction to Environmental Geology Laboratory	
BIOO 105N	Introduction to Botany	
<b>Total Hours</b>		<b>26-27</b>

Minimum Required Grade: C-

### Upper-Division Required Courses

Code	Title	Hours
<b>Complete all of the following courses:</b>		
BIOE 370	General Ecology	3
BIOE 428	Freshwater Ecology	3-5
or BIOO 335	Rocky Mountain Flora	

NRSM 344	Ecosystem Science and Restoration Capstone	5
NRSM 385	Watershed Hydrology	3
NRSM 465 or BIOE 447	Foundations of Restoration Ecology Ecosystem Ecology	3
NRSM 494	Ecosystem Science and Restoration Seminar	1
NRSM 495 or NRSM 498 or NRSM 499	Ecosystem Science and Restoration Practicum Internship Senior Thesis	3
<b>Total Hours</b>		<b>21-23</b>

Minimum Required Grade: C-

### ESR Natural Science Electives

**Note:** courses may not count as an elective if taken to satisfy other listed requirements.

Code	Title	Hours
<b>Complete three of the following courses:</b>		
BIOE 416	Alpine Ecology	9
BIOE 447	Ecosystem Ecology	
BIOE 448	Terrestrial Plant Ecology	
BIOE 451	Landscape Ecology	
BIOE 458	Forest and Fire Ecology	
BIOO 320	General Botany	
BIOO 340	Biology and Management of Fishes	
BIOO 433	Plant Physiology	
ERTH 303N	Weather and Climate	
FORS 202	Forest Mensuration	
FORS 250	Intro to GIS for Forest Mgt	
FORS 330	Forest Ecology	
FORS 331	Wildland Fuel Management	
FORS 333	Fire Ecology	
FORS 347	Multiple Resource Silviculture	
GEO 318	Earth's Changing Climate	
GEO 420	Hydrogeology	
GEO 421	Hydrology	
GEO 460	Process Geomorphology	
GPHY 111N & GPHY 112N	Intro to Physical Geography: Climate, Landforms, and Vegetation and Intro to Physical Geography Laboratory: Climate, Landforms, and Vegetation	
GPHY 317	Geomorphology	
NRSM 211N & NRSM 212N	Soils and Water and Ecology, Physics and Taxonomy of Soils	
NRSM 360	Rangeland Management	
NRSM 408	Global Cycles and Climate	
NRSM 415	Environmental Soil Science	
NRSM 418	Ecosystem Climatology	
NRSM 462	Rangeland Ecology	
NRSM 465	Foundations of Restoration Ecology	

WILD 470	Conservation of Wildlife Populations	
WILD 485	Aquatic Invertebrate Ecology	
<b>Total Hours</b>		<b>9</b>

Minimum Required Grade: C-

### Ethics

Code	Title	Hours
<b>Complete one of the following courses:</b>		
NRSM 349E	Climate Change Ethics and Policy	3
NRSM 389E	Ethics and Sustainability	
<b>Total Hours</b>		<b>3</b>

Minimum Required Grade: C-

### Policy

Code	Title	Hours
<b>Complete one of the following courses:</b>		
NRSM 422	Natural Resource Policy and Administration	3
NRSM 427	Water Policy	
NRSM 428	Climate Policy	
WILD 410	Wildlife Policy & Biopolitics	
<b>Total Hours</b>		<b>3</b>

Minimum Required Grade: C-

### Social Science

Code	Title	Hours
<b>Complete one of the following courses:</b>		
NRSM 326	Climate and Society	3
NRSM 379	Collaborations in Natural Resource Decisions	
NRSM 424		
NRSM 475	Environment & Development	
PTRM 300	Recreation Behavior	
<b>Total Hours</b>		<b>3</b>

Minimum Required Grade: C-

### Advanced Writing Requirement

Code	Title	Hours
<b>Complete three of the following courses:</b>		
BIOE 428	Freshwater Ecology	9
BIOE 447	Ecosystem Ecology	
FORS 330	Forest Ecology	
FORS 341	Timber Harvesting & Roads	
FORS 347	Multiple Resource Silviculture	
FORS 349	Practice of Silviculture	
FORS 440	Forest Stand Management	
FORS 499	Senior Thesis	
NASX 403		
NRSM 326	Climate and Society	

NRSM 349E	Climate Change Ethics and Policy
NRSM 379	Collaborations in Natural Resource Decisions
NRSM 389E	Ethics and Sustainability
NRSM 462	Rangeland Ecology
NRSM 465	Foundations of Restoration Ecology
NRSM 475	Environment & Development
NRSM 495	Ecosystem Science and Restoration Practicum
NRSM 499	Senior Thesis
PTRM 300	Recreation Behavior
WILD 410	Wildlife Policy & Biopolitics
<b>Total Hours</b>	<b>9</b>

Minimum Required Grade: C-