

# ECOSYSTEM SCIENCE AND RESTORATION - TERRESTRIAL

The major in Ecosystem Science and Restoration prepares students to understand how ecosystems work to solve pressing environmental problems or help restore degraded ecosystems. Students can select one of two options:

- the terrestrial concentration, which focuses on the understanding and repair of terrestrial ecosystems; and
- the aquatic concentration, which focuses on aquatic ecosystem function and watershed restoration.

Students engage in field-based learning, contribute to cutting-edge restoration or ecosystem science projects, and are challenged to apply ecological theory to research projects and restoration practice. The major requires completion of a nine-credit restoration capstone, during which students gain hands-on real-world experience planning and implementing research or restoration projects in partnership with natural resource management agencies and organizations in western Montana.

A degree in Ecosystem Science and Restoration prepares students for careers as ecologists or restoration practitioners with non-profit, private, or governmental agencies and for graduate school in ecology or natural resource management. Students who graduate with this major may qualify for the following federal civil service jobs:

- biological technician (Series 0404),
- ecologist (Series GS-408),
- forester (Series G-460),
- hydrologist (Series GS-1315) and
- soil conservationist (Series GS-457).

More information on federal civil service requirements can be found at (<https://www.opm.gov/policy-data-oversight/classification-qualifications/general-schedule-qualification-standards/#url=List-by-Title>): <https://www.opm.gov/policy-data-oversight/classification-qualifications/general-schedule-qualification-standards/#url=List-by-Title>.

## Bachelor of Science - Ecosystem Science & Restoration; Terrestrial Concentration

### W.A Franke College of Forestry & Conservation

Degree Specific Credits: 92-94

Required Cumulative GPA: 2.0

Catalog Year: 2018-2019

## General Education Requirements

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

## Summary

Code	Title	Hours
	Lower-Division Major Required Courses	6
	Lower-Division Outside Major Required Courses	25-26

Upper-Division Major Required Courses	21
Upper-Division Outside Major Required Courses	3
Terrestrial Restoration Concentration Required Courses	16-17
Terrestrial Restoration Concentration Electives	9
Social Science Elective Courses	3
Upper-Division Writing Requirement	9
Total Hours	92-94

## Lower-Division Major Required Courses

Code	Title	Hours
<b>Complete all of the following courses:</b>		
NRSM 121S	Nature of Montana	3
or NRSM 170	International Envir. Change	
NRSM 265	Elements of Ecological Restoration	3
Total Hours		6

Minimum Required Grade: C-

## Lower-Division Outside Major Required Courses

Code	Title	Hours
<b>Complete all of the following courses:</b>		
BIOB 160N	Principles of Living Systems	3
BIOB 161N	Prncpls of Living Systems Lab	1
BIOB 260	Cellular and Molecular Biology	4
BIOB 272	Genetics and Evolution	4
CHMY 121N	Introduction to General Chemistry	3
CHMY 123	Introduction to Organic and Biochemistry	4
COMX 111A	Introduction to Public Speaking	3
or THTR 120A	Introduction to Acting I	
<b>Complete one of the following courses:</b>		3-4
STAT 216	Introduction to Statistics	
FORS 201	Forest Biometrics	
WILD 240	Intro to Biostatistics	
Total Hours		25-26

Minimum Required Grade: C-

## Upper-Division Major Required Courses

Code	Title	Hours
<b>Complete all of the following courses:</b>		
NRSM 344	Ecosystem Science and Restoration Capstone	5
NRSM 385	Watershed Hydrology	3
NRSM 389E	Ethics Forestry & Conservation	3
or NRSM 349E	Climate Change Ethics/Policy	
NRSM 422	Nat Res Policy/Administration	3
NRSM 465	Foundations of Restoration Ecology	3
or BIOE 447	Ecosystem Ecology	
NRSM 494	Ecosystem Science and Restoration Seminar	1

<b>Complete one of the following courses:</b>		3
NRSM 495	Ecosystem Science and Restoration Practicum	
NRSM 498	Internship (ESR Capstone Internship Experience)	
NRSM 499	Senior Thesis	
Total Hours		21
Minimum Required Grade: C-		

## Upper-Division Outside Major Required Courses

Code	Title	Hours
<b>Complete the following course:</b>		
BIOE 370	General Ecology	3
Total Hours		3
Minimum Required Grade: C-		

## Terrestrial Restoration Concentration Required Courses

Code	Title	Hours
<b>Complete all of the following courses:</b>		
BIOO 105N	Introduction to Botany	3
BIOO 335	Rocky Mountain Flora	3
M 162	Applied Calculus	4
NRSM 210N	Soils, Water and Climate	3
<b>Complete one of the following courses:</b>		3-4
BIOE 448	Terrestrial Plant Ecology	
FORS 340	Forest Product Manufacturing	
NRSM 462	Rangeland Ecology	
Total Hours		16-17
Minimum Required Grade: C-		

## Terrestrial Restoration Concentration Electives

**Note:** No double dipping is allowed with core courses.

Code	Title	Hours
<b>Complete 9 credits of the following courses:</b>		
BIOE 342	Field Ecology	
BIOE 416	Alpine Ecology	
BIOE 447	Ecosystem Ecology	
BIOE 448	Terrestrial Plant Ecology	
BIOE 451	Landscape Ecology	
BIOE 458	Forest and Grassland Ecol	
BIOO 320	General Botany	
BIOO 433	Plant Physiology	
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	Climate System Dynamics	
NRSM 360	Rangeland Mgt (equiv 260)	
NRSM 408	Global Cycles and Climate	
NRSM 415	Environmental Soil Science	
NRSM 418	Ecosystem Climatology	
NRSM 465	Foundations of Restoration Ecology	
NRSM 462	Rangeland Ecology	
WILD 470	Conserv of Wildlife Populatns	
Total Hours		9

Minimum Required Grade: C-

## Social Science Elective Courses

Code	Title	Hours
<b>Complete one of the following courses:</b>		
ECNS 433	Economics of the Environment	3
FORS 320	Forest Environmental Economics	
NRSM 379	Collab in Nat Res Decisions	
NRSM 426	Climate and Society	
NRSM 427	Advanced Water Policy	
NRSM 475	Environment & Development	
Total Hours		3
Minimum Required Grade: C-		

## Upper-Division Writing Requirement

Code	Title	Hours
<b>Complete three of the following courses:</b>		
BIOE 428	Freshwater Ecology	
FORS 330	Forest Ecology	
NRSM 344	Ecosystem Science and Restoration Capstone	
NRSM 379	Collab in Nat Res Decisions	
NRSM 465	Foundations of Restoration Ecology	
NRSM 495	Ecosystem Science and Restoration Practicum	
NRSM 499	Senior Thesis	
Total Hours		9
Minimum Required Grade: C-		