

ENSC 201 -- The Recovery and Restoration of Altered Ecosystems

Course Syllabus, Spring 2007

Instructors:

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Office Hours:

Generally available TTH 9:00 – 10:30 a.m. Generally available TTH 8:30 – 10:30 a.m.

Other times by appointment

Other times by appointment

Teaching Assistant:

Dani Newcomb

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Meeting Time and Place

Tuesdays, 12:30-4:45 p.m., Aiken Center, Room 116 and beyond

Thursdays, 2:00 – 3:15 p.m., Aiken Center, Room 116

As the semester progresses and weather permits, Tuesday classes will increasingly be focused on hands-on activities in the field

Class Web Site: www.uvm.edu/envnr/ensc201

Course Description

This course will provide students with an understanding of the role of stresses and disturbances in aquatic and terrestrial ecosystems and natural processes of recovery. Students will be introduced to the practices used to modify, restore, and remediate ecosystems altered by human activities and will develop a restoration program for a nearby, altered ecosystem that contains both land and water components.

Course Objectives

Upon completion of this course, you will:

1. Understand how various stresses and disturbances reconfigure aquatic and terrestrial

	ecosystems.	
2.	Understand the range of natural processes that are linked to ecosystem recovery.	
3.	Have a working knowledge of the variety of management practices used to modify, restore or remediate altered ecosystems	
4.	Have developed a plan for a real-world restoration project.	
5.	Have implemented some restoration practices in the field.	
Readings		
<p>Selections from various sources will be used as readings. Sources will include ecology texts, the journal literature (<i>Restoration Ecology</i>, <i>Environmental Management</i>, <i>Journal of Environmental Quality</i>, and others), restoration engineering handbooks, other publications, and the internet. Readings will be made available through links on the class web site or be placed on reserved in Bailey-Howe Library.</p>		
Grading		
	Two Preliminary Exams	25%
	Final Exam	25%
	Classroom Activities, Homework Assignments (including free writes), Class Participation and Attendance	25%
	Restoration Project	25%
<p>Restoration ecology is an applied discipline, best learned by hands-on activities and practice. Therefore, class attendance and participation are essential for mastering the material. It is not realistic to expect to do well in this class without participating in the classroom activities.</p>		
<p>Additional information about each homework assignment and its due date will be provided in class. Students will be expected to turn in a free write on the readings that are assigned each week. Assignments submitted after the due date will be penalized one letter grade per day except in extreme unusual circumstances (advanced arrangement required).</p>		

The restoration project is a service-learning activity and the capstone piece of the course. It will involve working on a restoration plan for a site with significant degradation and implementing appropriate pieces of that restoration in the field. Beginning in mid March, most laboratory sessions will focus on the project site. The restoration project will be conducted in small groups. The final products will include both a group written report and an oral presentation to the class at the end of the semester.

One Saturday, probably the last Saturday in late April (April 28), will be required to implement the first phase of the restoration plan.

Academic Integrity

We expect all students to adhere to UVM's code on academic honesty. Violations are serious offenses and can result in expulsion from the University. Although we encourage all students to discuss material and ideas freely among yourselves and with us, unless otherwise instructed, all work submitted for grading must be strictly your own.

Course Outline

Introduction to the course and the restoration project	Jan 16-18
Restoration ecology - the acid test of ecological understanding	
<input type="checkbox"/> Terms and context	
<input type="checkbox"/> The need for restoration	
<input type="checkbox"/> Restoration as experimentation	
<input type="checkbox"/> Ecosystem context for restoration	
Ecosystem dynamics - applying ecological knowledge to restoration	Jan 23-30
<input type="checkbox"/> The nature of stress and disturbance in ecosystems	
<input type="checkbox"/> Stability, resilience, change	
<input type="checkbox"/> Colonization, legacies, and succession	
<input type="checkbox"/> Natural variability	
<input type="checkbox"/> Human-induced changes in ecosystems	
<input type="checkbox"/> Invasion of exotic species	
<input type="checkbox"/>	
Hurricane Katrina case study	Feb 1-6
Restoration ecology in aquatic systems	Feb 8--13

	Common problems and the need for restoration of lakes, wetlands, and estuaries	
	A system context for defining restoration objectives and achievable outcomes	
	Restoring nutrient dynamics and trophic structure in lakes	
	Controversies about restoring wetland functions	
	Managing colonization and regeneration processes	
	Restoring wetland and coastal landscapes	
Restoration ecology in terrestrial ecosystems		Feb 15-20
	Landforms and land classification	
	Modifying soil chemistry	
	Silvics and silviculture	
Restoration of old-growth and fire-prone forests		
First Hour Exam		Feb 22
Town Meeting Day (no class)		Mar 6
In-stream processes		Feb 27 – Mar 8
	River continuum concept and other conceptual models	
	Watershed dynamics, stream geomorphology	
	Water quality	
	Bank protection and stabilization, hard and soft engineering	
	Restoring biota -fish and macroinvertebrates	
Spring Break -no class		Mar 12-16
Introduction to the project site, site assessment		Mar 20-22
Restoring riparian forests and buffers		Mar 27-29
Plant Propagation		Apr 3
Second Hour Exam		Apr 5

Group work on project site	Apr 10
Project monitoring, evaluation, and adaptive management	Apr 12
Marine and coral reef restoration	Apr 17-19
Group presentations	Apr 24-26
Project work day	Sat, Apr 29
Project reflection and course evaluation	May 1
Final Exam (8:00 am in Aiken 116)	Friday, May 4