

NR 385, Ecological Restoration

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Course Description

This course will include both general theory behind ecosystem restoration, taught through lectures and group discussions, as well as field trips and a project designed to give the student a more hands-on understanding of these general principles, as well as the importance of site-specific criteria. We will also explore the diverse human aspects of restoration, meeting with various stakeholders involved in restoration, including conservation non-government organizations (NGOs), stewardship volunteer groups, and environmental consultants.

Like ecosystems themselves, ecological restoration is a multifaceted field - successful restoration requires a good understanding of site-specific conditions, ecosystem processes, monitoring and management. In addition to knowing basic science, restorationists must work with various public groups to gain support and resources for restoration. We will also explore these social and human dimensions of restoration. We will also look at "big-picture" restoration - the methods and thought underlying restoration of watersheds, ecoregions, and other large-scale work that is critical for maintaining ecological integrity of species, ecosystems, and the planet.

Objectives

This course should prepare you to understand the diverse aspects of ecological restoration, allowing you to work more effectively in various fields in natural resources, conservation, and ecology. With an understanding of basic ecosystem processes and restoration techniques, you should be able to evaluate, prepare, and implement ecological restoration and management plans.

Prerequisites

Prerequisites include coursework in basic ecological principles, including field sampling and natural history (NR 205 or equivalent).

Course Mechanics

We will meet from 2-4 on Tuesdays for lecture and discussion and 1-4 on Thursdays for field trips. Attendance and participation in both lecture and lab are critical, with each week's lecture and lab designed to reinforce key concepts in ecological restoration. Assigned readings (including journal articles, restoration guidebooks, and other publications) will be provided to the student through the course of the semester; students are expected to come prepared to discuss key points from these articles and the lecture.

Evaluation/Grading

Real-world ecological restoration is rarely, if ever, a solo endeavor. Therefore, your lab work and the final project will be done in small groups of generally 2-3 students. After each lab, your lab group will produce a single short report (no more than 1 page) addressing the questions from that lab handout.

The final project will involve a case study of a specific restoration site. Each group will give a 30-minute oral presentation to the class (generally 20 minutes of talking, followed by 10 minutes for questions/discussion), including appropriate visual aids, and will also produce a short (no more than 5-7 page) written report. Data sources should include interviews of site stewards/managers, existing restoration, management, and monitoring plans, and results of student field trips to the site.

Lecture & Lab participation/short reports	30%
Midterm exam	30%
Final project	40%

Tentative Schedule (Lecture/Lab)

Week 1 - Intro to ecological restoration / Walking tour of on-campus natural areas

Week 2 - Goal setting for ecological restoration / Forest restoration field trip

Week 3 - Reading the landscape: degraded vs. high-quality sites / Grassland restoration field trip

Week 4 - Restoring ecosystem processes / Visit to local conservation NGO

Week 5 - Regulatory requirements in restoration / Wetland restoration field trip

Week 6 - Monitoring and adaptive management / Field monitoring techniques

Week 7 - Shoreline restoration and water quality / Coastal restoration field trip

Week 8 - Ecosystem management techniques / Restoration workday at on-campus natural areas

Week 9 - Ecoregional planning: prioritizing land for conservation and restoration /
Midterm exam

Week 10 - Human dimensions of restoration / Visit with local volunteer organizations

Week 11 - Funding for restoration / Visit with environmental consultant

Week 12 - Ecosystem service valuation: ecological economics, costs & benefits, and restoration / Work on student presentations

Week 13 - Applying restoration concepts to other ecosystems / Work on student presentations

Week 14 - Student presentations

Week 15 - Student presentations