

NRSM 465 RESTORATION ECOLOGY

Introduction:

This course covers the primary ecological theories that inform the practice of ecological restoration. Topics covered include community assembly, the dynamic nature of ecological systems, biodiversity and ecosystem functioning, food web dynamics, ecological resilience, genetic considerations for restoration, and statistical issues and study design. A primary focus will be to apply ecological theory to the practice of restoration. Prerequisites include at least one advanced undergraduate ecology course and one course in ecological restoration. All pre-requisites must be met prior to enrollment.

Meeting Times:

Mondays 2:10-4:00 PM; Wednesday 2:10-3:00 PM.

Meeting Location:

FOR 301

Instructor:

Rebecca Lloyd, Department of Ecosystem and Conservation Sciences, College of Forestry and Conservation. Official Email: rebecca.lloyd@umontana.edu, Alternative email: rebeccay2y@gmail.com.

Office: Virtual. I have desk space in the Science Complex (Clapp 460), but I don't usually work there, but I am in Missoula Mondays and Wednesdays (and most Tuesdays), so generally available for in person meetings.

Office hours: Mondays and Wednesdays by appointment for in-person meetings. Any time via email contact for questions.

Course Format:

This course combines lectures on restoration-relevant ecological theory with seminars and other activities that provide an opportunity to discuss course materials as well as build skills in synthesizing scientific literature, and evaluating and writing research papers. The semester will end with a series of student debates on key topics within restoration ecology. The course involves substantial among-peer interaction and peer learning.

Course Objectives and learning outcomes

This course explicitly focuses on the ecological theories that must be successfully incorporated into restoration practice, in addition to examples where an ignorance of these ideas has led to less-than-ideal outcomes in real-world situations.

Specific Objectives

- To explore fundamental ecological theories and their relevance to the practice to ecological

restoration;

- To examine the principles of scientific inference and to critically apply these principles to both ecological theory and restoration practice;
- To practice synthesizing information from the scientific literature; and
- To explore the structure of research articles and practice scientific writing.

Learning Outcomes

By completing this course students will be able to:

- Integrate key ecological theories into restoration practice.
- Identify and discuss the relevance of scientific ideas for use in a practical framework;
- Evaluate restoration case studies for success or failure in part by assessing their adherence to ecological principles as they are currently understood.
- Analyze and succinctly summarize articles from the peer-reviewed literature;
- Use library resources and electronic databases to find sources of information;
- Use published literature to develop research ideas and answer research questions;
- Organize and write a review paper that includes: clearly defined objectives and research questions; methods used to identify sources of information, collect data from those sources, and analyze data; and results and discussion; and
- Use electronic reference software for managing citations and preparing bibliographies.
- Develop logical and persuasive arguments about ecological concepts and communicate ideas orally.

Pedagogy:

The assignments and expectations for this course are deliberately designed to be challenging. As an advanced course, the curriculum requires that students integrate knowledge rather than just memorizing and repeating ideas presented in lecture. As such, course assignments and exams are designed to help students push their boundaries and think both broadly and deeply about the material covered in class, knowledge gained from other coursework, and relevant work experiences. *A commitment to coming to class prepared and eager to discuss ideas, dilemmas and solutions is necessary for success in this course.*

Expectations for Assignments:

Instructors have high expectations and standards for students' written work and oral contributions. The ability to evaluate the substantive merits of student work is seriously impeded by typographical errors, excessively poor grammar and poorly organized or constructed sentences; these errors will be interpreted as a lack of interest in your work and the course. There are services available on campus to assist in developing and improving writing skills (e.g. The Writing Center http://www.umt.edu/writingcenter/welcom_about.htm). If you are unsure of the quality of your writing, please make use of these services in addition to asking the course instructor for additional commentary and feedback on assignments.

Reading Assignments

Textbook: *Foundations of Restoration Ecology*. D.A. Falk, M.A. Palmer and J.B. Zedler eds., Island Press.

Additional readings will be assigned from the contemporary scientific literature, chapters from books, and popular sources. Reading assignments will be handed out in class or posted on Moodle (UM's Online Course Supplement) two weeks prior to their due date. If you need technical assistance with Moodle, you can send the support team an email at courseware-support@umontana.edu, call 243-4999, or visit the support site (<http://umt.edu/xls/techsupport/>).

Reference reading — Students interested in delving more deeply into aspects of restoration can find reference information within *The Science and Practice of Ecological Restoration* book series, published by Island Press.

Literature Review

Each student will write a literature review as their term paper for this course. Several course sessions will be devoted to the process of conducting research, specific methods for writing a research paper based on a literature review, and using reference software. In addition to writing a review paper, each student in the course will be expected to review the first drafts of two other students' papers.

Deadlines for Literature Review:

- **2/10 (Wednesday):** Submit 3 proposed topics for Literature Review
- **2/17 (Wednesday):** Submit brief description of literature review topic include objectives and research questions
- **4/18 (Monday):** First Draft Due
- **4/25 (Monday):** Peer Review of two other students paper is due
- **5/6 (Friday):** Final Draft Submitted on Moodle

Note: A detailed hand-out describing expectations will be provided.

Seminars

This course includes four seminars during which students will explore concepts from lectures and critically evaluate primary literature. For three of the four seminars, students will be expected to submit a review that: 1) describes the contribution the assigned reading makes to ecological theory, 2) critically reviews the paper paying particular attention to whether the data support the conclusions drawn by the author(s), and 3) describes potential application to restoration practice. If more than one reading is assigned for a seminar, students may select which one to summarize. To assist you in writing your review, a review form will be circulated prior to the first seminar. ***These reviews are due at the beginning of the relevant seminar.***

Note: A detailed hand-out describing expectations will be provided.

Mid-term exam

There will be an essay-style, open-book mid-term exam on Monday, 3/7 in the CFC computer lab in Stone Hall.

Debates

We will have three in-class debates the last two week of the semester. Debate topics will be announced. Each student will be assigned to a debate team. Two class sessions have been set aside for teams to prepare for the debates.

Note: A detailed hand-out describing expectations will be provided.

Evaluation

Students will be evaluated based on their preparation for and performance in lectures and seminars, mid-term exam score, debate score, literature review score, and the quality of their overall participation in the course. Overall participation points will be based on attendance and quality of participation in discussions.

Literature Review 75 points (39%)	
Peer Reviews 20 points (11%)	
Mid-term Exam 50 points (26%)	
Seminars (4 of 5 paper critiques) 20 points (11%)	
Debate (1 of 3) 18 points (9.0%)	
Participation (overall contribution) 7 points (4%)	
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Total points possible 190 points	

This course is offered as traditional letter grade only. Students cannot change to credit/no credit at any time during the semester. Letter grades will be assigned bases on students' numeric scores as follows:

- A = \geq 94%, A- = 90-93%
- B+ = 87-89%, B = 84-86%, B- = 80-83%
- C+ = 77-79%, C = 74-76%, C- = 70-73%
- D = 60-69%
- F = <60%

Graduate Increment

Graduate students enrolled in this course are expected to play a leadership role in the seminars. Each graduate student enrolled in the course will be responsible for leading (or co-leading) at least one seminar during the semester; the seminar leader will introduce the concepts at the beginning of the seminar, guide the discussion during the seminar, and summarize key points at the seminar's conclusion.

General Guidelines

Communication:

All official course communications outside of class will be sent to students' University of Montana email accounts. It is your responsibility to regularly check your University account. Beware: If your email account is full, you will not be able to send messages (but Griz mail will not tell you that the message has not been sent). In general, our policy is to try to respond to email within 24 hours. We do check our email accounts regularly during the week, but as a rule will not respond to email sent over the weekend. When Rebecca is working from her office at the Forest Service Ranger Station in Idaho (usually Wednesday eve through Saturday a.m.), the best contact email will be her Gmail account (UM Web based Outlook does not always work). This is fine for quick questions about course material or trying to arrange a time to meet.

Classroom environment:

Students at University of Montana are diverse in many ways, including race, gender, age, religion, preparedness, and mobility. Please help create a respectful learning environment by honoring all student contributions and expressing your views in ways that do not diminish other students' perspectives.

Plagiarism:

All students must practice academic honesty, including taking care not to plagiarize the words or ideas of others (i.e. submitting a direct quotation from a source without using quotation marks and citing the original document; or submitting text based on someone else's ideas without proper citation). Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review on line at: [Student Conduct Code Web Page](#).

The penalty for plagiarism in this course is zero credit on the plagiarized assignment in addition to any consequences per the Student Conduct Code.

Disability modification:

Students with disabilities will receive reasonable modifications. It is the student's responsibilities to request modifications from the instructors with sufficient advance notice, and to be prepared to provide verification of disability and its impact from Disability Services. Please make an appointment to speak to one of the Instructors after class during the first two weeks of the semester to discuss details. For more information, visit the *Disability Services for Students* website at www.umt.edu/dss/.

Procedure for dropping the course:

The procedures, rules, and timeframes for dropping this (and other spring courses) are listed below. Note that dropping courses may have implications for financial aid and/or health insurance.

- *February 2nd - Last Day to add courses in Cyberbear without consent*
- *February 12th – This is the last day to add or drop courses on Cyberbear, without a special fee or penalty.*

- *February 14th-March 28th – During this period, students may drop courses using a Course Drop Form. The course will appear on students’ transcripts with a “W” for “withdrawal” instead of a grade. The Drop Form requires signatures from the course instructor and then the faculty advisor. A \$10 fee will be assessed, and there is no refund of tuition or fees.*
- *March 29 to May 6 - Spring Adds only with Add/Change form and Instructor and Advisor’s signature. Drops require Dean’s signature as well. \$10 Fee. And, WP or WF on transcript.*