

# NRSM 344 Ecological Restoration Capstone

## SYLLABUS Spring 2016

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### Introduction:

This five-credit, service-learning course is the planning course for the capstone experience for students in the Ecological Restoration major (although it is also open to students pursuing other majors). It is designed to get students active in the field of restoration through the application of ecological principles to restoration practice and through direct service-learning. The course centers around two service-learning activities that are conducted in collaboration with a local community partner: 1) developing a group capstone project proposal, and 2) hosting a volunteer restoration event.

*All students enrolled in this course must have the desire and motivation to interact with local restoration professionals and to contribute in a meaningful way to real world projects.*

Partners for the course this year are:

- Five Valley's Land Trust
- Missoula County Parks and Trails Department
- Trout Unlimited
- MPG Ranch

### Prerequisites:

Students must have completed at least one course in:

- Ecology
- Ecological restoration (NRSM265 *Elements of Ecological Restoration* or equivalent)

### Time and place

- Wednesdays, 3:10-5:00 PM, Liberal Arts 243
  - Usually, the first hour will be lecture or structured discussion; the second hour will be student group meetings to discuss capstone projects.
- Fridays, 2:10-5:00 PM, Liberal Arts 243
  - Usually, the first two hours will be lecture or structured discussions; the third hour will be student group meetings to discuss capstone projects.

### Instructor contact information

- Dr. Alexis Gibson, Field Learning Coordinator, Ecological Restoration Program. Email: [alexis.gibson@umontana.edu](mailto:alexis.gibson@umontana.edu); Office: 460 Clapp. Phone: 503-309-5255.
  - Office Hours: Wednesday 1:10 – 3:00 PM. Please make an appointment in advance.

### Learning outcomes:

By completing this course students should be able to:

- 1) Compile a high-quality application for a job in ecological restoration;
- 2) Evaluate ecological restoration plans developed by others;
- 3) Write a restoration or monitoring proposal;

- 4) Use reference software and “cite-while-you-write” programs;
- 5) Organize a volunteer restoration work day for a community partner; and
- 6) Communicate effectively with community members about the importance of ecological restoration.

### **Course format:**

A variety of learning tools will be used, including lectures, field trips and peer-learning activities.

*Lectures* — Lectures will be based on readings that will be made available ahead of class and will form the basis of in-class discussion (see below for more information on reading assignments). During class sections that include lecture, lecture periods will be from 3:10-4:00 PM (Weds) or 2:10-4:00 PM (Fri).

*Field trips* — Field trip vans will leave campus promptly at 2:10 PM and 3:10 PM and will arrive back by 5:00 PM. Please make sure that you are on time, as the short duration of the class period will not permit waiting for late comers. Vehicles will leave from the parking lot south of Davidson Honors College, west of Forestry, and east of Old Journalism.

*Volunteer event* — In addition to trips scheduled during class periods, each student will be required to work with a group to organize and participate in one out-of-class restoration work party on a weekend (students will be involved in scheduling).

*Peer learning* — Peer learning has been shown to be a highly effective teaching tool and is an integral component of the course. Students will work in groups with a community partner to develop a restoration or monitoring plan (see details below) and a volunteer restoration event (see details below). Students will have three opportunities during the semester to share their service learning experience and reflect on their learning. Most class sessions will include time for peer-group meetings between 4:10-5:00 PM.

*Professional presentations and meetings with project sponsors* — This course includes professional presentations and meetings (see schedule below). Please dress and act professionally for these events. Contact instructor if you have any questions.

### **Assignments:**

Instructions for all assignments will be posted on Dropbox, an on-line file-sharing site. A primer on using Dropbox will be given in class.

(1) *Required reading* — Most reading in this course will be self-directed. There are two short, assigned textbooks, both available at the bookstore

- *Effective Ecological Monitoring*, Lindenmayer and Likens (CSRIO 2010);
- *Writing Scientific Research Articles*, Cargill and O'Connor (Wiley-Blackwell 2013)

Additional readings will be assigned from the contemporary scientific literature, chapters from books, and popular sources. All reading materials either will be provided in class or will be available on Dropbox. Students will be expected to answer questions about the readings during class discussion.

Students interested in delving more deeply into aspects of ecological restoration can find reference information within the following (optional):

- *The Science and Practice of Ecological Restoration* book series, published by Island Press. A list of books published within this series can be found at: [http://www.ser.org/reading\\_resources.asp](http://www.ser.org/reading_resources.asp).
- Hill, H. and R. Simpson (ed). 2001. *Stream Corridor Restoration: Principles, Processes, and Practices*. Federal Interagency Stream Restoration Working Group. Available for free download at: [www.nrcs.usda.gov/technical/stream\\_restoration/newtofc.htm](http://www.nrcs.usda.gov/technical/stream_restoration/newtofc.htm)
- Roni, P. 2005. *Monitoring Stream and Watershed Restoration*. American Fisheries Society. Bethesda, MD.
- Whisenant, S. G. 1999. *Repairing Damaged Wildlands: a Process-Oriented, Landscape-Scale Approach*. 1999. Cambridge University Press. New York.
- Williams, J. E., C. A. Wood, and M. P. Dombeck (ed). 1997. *Watershed Restoration: Principles and Practices*. American Fisheries Society. Bethesda, MD.

(2) *Resume and Cover Letter* – Students will work independently and in groups to develop a high-quality resume and cover letter. Both documents will be shared with the project sponsor.

(3) *Restoration Plan Critique* — Students will independently critique restoration plans and submit a written evaluation (see assignment) due in class on February 24<sup>th</sup>. Class on the 24<sup>th</sup> will be a seminar in which students will discuss their plan evaluations.

(4) *Capstone Proposal (Service Learning)* — Students will work in teams to develop a restoration or monitoring proposal for a local community partner. This assignment will involve independent research and incorporate ecological theory, experimental design, land management practices, and budgeting. For students required to enroll in *Ecological Restoration Practicum* (NRSM495; required for the Ecological Restoration degree), this proposal will form the basis of the practicum proposal. Students will be given a choice of projects that are suitable for the course assignment. The process of interacting with restoration scientists and professionals is an important educational component of this course; therefore, students will be required to send a resume and cover letter to project sponsors. During the semester, students will have three opportunities (see course schedule) to share their experiences working on this project and to reflect on their service learning outcomes.

The proposal counts for 65% the course grade. Individual group member grades will be weighted by individual participation and performance within the group. Components of the project are due throughout the course (see assignment).

**Failure to submit the final version of the Capstone Proposal at the end of the semester will result in no credit for the final proposal, and students will be unable to register for NRSM 495. There are no extensions for the final proposal.**

(5) *Volunteer Restoration Work Day* — Students will work in teams to organize a volunteer restoration work party for their community partner, to be held on a Saturday of the group's choice. Students must submit a formal Volunteer Day Plan (see assignment). The volunteer events will be evaluated by the course instructors, community sponsor, and the volunteers who attend. During the semester, students will have three opportunities (see course schedule) to reflect on their service learning outcomes.

(6) *Power Analysis Assignment* — Students will have an opportunity to learn how to develop field methods and assess precision of estimation associated with different sampling designs through a power analysis exercise. The exercise involves collecting and analyzing field data.

**Formal Writing Assignments:**

This course fulfills UM's General Education Upper Division Writing requirements for CFC majors (CFC majors require that students take three distributed UD writing courses). Upper Division writing courses are designed to give students advanced experience with college-level writing. Formal writing assignments in this course include: 1) Resume and Cover Letter (individual assignment; 3-4 pages; one revision; 5% of grade); 2) Restoration Plan Critique (individual assignment; 3-4 pages; no revisions; 5% of grade); 3) Volunteer Day Plan (group assignment; 4-6 pages; one or two revisions; 15% of grade); 4) Self-evaluation (5% of grade); and 5) Capstone Proposal (group assignment; at least 12 pages; four revisions; 65% of grade).

**Absolutely no late assignments will be accepted (unless legitimate emergency situations arise); assignments submitted late will receive no credit and no feedback. This course has a very tight schedule and builds on previous assignments – falling behind will make meeting deadlines and completing your work in the class much more difficult.**

*Approved Upper-Division Writing Course Learning Outcomes*

- Use writing to learn and synthesize new concepts;
- Formulate and express written opinions and ideas that are developed, logical, and organized;
- Compose written documents that are appropriate for a given audience or purpose;
- Revise written work based on constructive feedback;
- Find, evaluate, and use information effectively and ethically;
- Begin to use discipline-specific writing conventions; and
- Demonstrate appropriate English language usage.

*Upper-division Writing Requirement in the Major Outcomes*

- Identify and pursue more sophisticated questions for academic inquiry;
- Find, evaluate, analyze, and synthesize information effectively from diverse sources;
- Manage multiple perspectives as appropriate;
- Recognize the purposes and needs of discipline-specific audiences and adopt the academic voice necessary for the chosen discipline;
- Use multiple drafts, revision, and editing in conducting inquiry and preparing written work;
- Follow the conventions of citation, documentation, and formal presentation appropriate to that discipline; and
- Develop competence in information technology and digital literacy.

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 (e.g., The Writing Center) available on campus to assist students in developing and improving writing skills. If you are unsure of the quality of your writing, please make use of these services in addition to asking Instructors for additional commentary and feedback on your assignments.

Students will be expected to use RefWorks or other reference software that allows you to maintain scientific references and “cite-while-you-write.” Students will also be expected to use MS Words Editing features (like “Track Changes”). Training will be provided.

### Evaluation

- Resume and Cover Letter 5%
- Restoration Plan Critique 5%
- Restoration Volunteer Plan and Even 15%
- Power analyses 5%
- Capstone Proposal 65%
- Self-evaluation 5%
- Total 100%

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 =  $<60\%$

### 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 12<sup>th</sup> – This is the last day to add or drop courses on Cyberbear, without a special fee or penalty.
- February 13<sup>th</sup>-March 28<sup>th</sup> – 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<sup>th</sup>- May 6<sup>th</sup> – During this period, students can only drop courses if they document an unforeseen medical or personal emergency (see Course Drop Form for allowable reasons. *The course will appear on students’ transcripts with a “WP” for “withdrawal/pass” or “WF” “withdrawal/fail”, depending on performance thus far. Students must obtain signatures from the course instructor, then their faculty advisor, and then the Associate Dean. A \$10 fee is assessed and there is no refund of tuition or fees.*

**Communication:**

All 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, my policy is to respond to email within 24 hours (except on the weekend).

**Dropbox:**

All students in the course will be sent an email through their University email inviting them to join a "Dropbox" folder. Dropbox is an on-line file sharing service that lets individuals share files and access these files from any computer. There are some basic rules to follow to ensure that files placed in Dropbox stay there.

1. You can access Dropbox files even when you are not on line. They will get cached on your computer.
2. If you work on a file stored in Dropbox when you are not online, the file will update the next time you connect to the internet.
3. When working on files in Dropbox, before you make any changes, you **MUST** save the file with a new name that includes your initials at the end of the file name.
4. Please do not move any files out of our Dropbox folder (or subfolders) as others will not be able to access them. If you want a copy of a file, copy and paste it rather than dragging the file to a new location.
5. Installing Dropbox on your computer will facilitate use of the service.

**Group dynamics:**

Working as a group can present many interpersonal challenges, including those relating to work style, communication, and scheduling. Please try to work through these challenges respectfully and with some flexibility. If there are issues that you can't deal with, please bring them to me as soon as possible.

**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](https://mail.cfc.umt.edu/exchweb/bin/redir.asp?URL=http://www.umt.edu/SA/VP/SA/index.cfm?page?1321)

(<https://mail.cfc.umt.edu/exchweb/bin/redir.asp?URL=http://www.umt.edu/SA/VP/SA/index.cfm?page?1321>). The penalty for plagiarism in this class is no credit on the assignment.

**Disability modification:**

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students (DSS). If you think you may have a disability adversely affecting your academic performance, and you have not already registered with DSS,

please contact DSS in Lommason 154 or 406.243.2243. I will work with you and DSS to provide an appropriate modification.

## Tentative Course Schedule

Date	Topic	Reading	Due
1/27	W	Course overview	
1/29	F	Introduction to Service Learning (SL) Projects	
2/3	W	Workshop: resumes and cover letters (Career Services Resource Library, Lommasson 154)  Meetings: student group meetings.	Resume: First draft resume (bring to class).
2/5	F	Meetings: student sponsor meeting (discuss objectives)	Resume: Revised resume and cover letter (Dropbox).
2/10	W	Workshop: peer-review of resumes and cover letters	Resume: Edits on other students' resumes and cover letters (bring to class).
2/12	F	Lecture: Writing a proposal	Cargill and O'Connor, Chapters 2 and 8. Proposal: Rough draft of project objectives (bring to class).
2/17	W	Workshop: electronic databases and "cite-while-you write" (meet in Mansfield Library Buckhous Room, ML 284)	1. Resume: Final resume and cover letter (email to sponsor and Dropbox) 2. Proposal: Objectives (email to sponsor and Dropbox).
2/19	F	Lecture: designing restoration and monitoring plans  Using GIS and aerial surveys to create base maps for restoration sites [Erik Samsoe and Mark Vander Meer]  <i>Assignment discussion and handout: Evaluation of restoration plan</i>	NOAA. 2003. Science-based restoration monitoring of coastal habitats <i>in A framework for monitoring plans under the estuaries and clean water act of (Volume one, Habitats)</i>
2/24	W	Seminar: discuss restoration plan.	Southwest Crown Collaborative. 2010. Southwest Assignment: Evaluation of restoration plan (bring to class).

			Crown of the Continent landscape restoration strategy.	
2/26	F	Engaging people and the media in restoration [Leana Shelvan]  <i>Assignment discussion and handout: Volunteer Day</i>	Grese et al. 2000. Psychological benefits of volunteering in stewardship programs. Chapter 13 in Gobster and Hull <i>Restoring Nature: Perspectives from the Social Sciences and Humanities</i>	
3/2	W	Meetings: student-sponsor meetings (volunteer day)		Proposal: Introduction through objectives (Dropbox)
3/4	F	Lecture: Monitoring	Lindenmeyer and Likens, Chapters 1 and 2	
3/9	W	Meetings: student groups (instructor rotates through groups)		Volunteer day: First draft of plan (Dropbox).
3/11	F	Lecture: Monitoring-continued	Lindenmeyer and Likens, Chapter 3 and 4	
3/16	W	Presentations (proposal introduction)		Proposal: Presentations (bring to class)
3/18	F	Presentations (proposal introduction)		Proposal: Intro through expected outcomes (Dropbox).
3/23	W	Meetings: student groups (instructor rotates through groups)		Volunteer day: Final draft of plan (Dropbox and email to sponsor).
3/25	F	Field trip: Hybrid poplar plantation [Mark Vander Meer]	<a href="http://missoulia.com/news/local/missoula-to-expand-acreage-of-poplar-trees-watered-with-effluent/article_0982ffba-c98e-11e2-97ad-0019bb2963f4.html">http://missoulia.com/news/local/missoula-to-expand-acreage-of-poplar-trees-watered-with-effluent/article_0982ffba-c98e-11e2-97ad-0019bb2963f4.html</a>	
3/30	W	Lecture: Determining sample size  <i>Assignment discussion and handout: Power analysis</i>		Power analysis assignment: select variable to test

4/1	F	That's my job! [Chris Carlson, Mark Mariano, Kali Becher]	
SPRING BREAK			
4/13	W	Field trip: Data collection	<ol style="list-style-type: none"> <li>1. Power analysis assignment: data sheets and field instructions for a single variable (16 copies to class).</li> <li>2. Proposal: Full proposal (except field methods; Dropbox).</li> </ol>
4/15	F	Activity: Power analysis (Stone Hall 107)	Power analysis assignment: cleaned and entered data (bring to class).
4/20	W	Seminar: discuss power analysis and data management	Power analysis: results from power analysis (bring to class).
4/22	F	Field trip: Data collection #2	Power analysis: revised data sheets and field instructions for a single variable (16 copies to class).
4/27	W	Meetings: student groups (instructor rotates through groups)	
4/29	F	Presentation practice (full)	<ol style="list-style-type: none"> <li>1. Proposal: presentation (bring to class).</li> <li>2. Proposal: final proposal (intro – field methods; Dropbox and send to sponsor).</li> <li>3. Proposal: scope of work (only required for students taking NRS344; Dropbox and send to sponsor).</li> </ol>
5/4	W	Presentation practice (full)	Power analysis assignment: final analysis (Dropbox)
5/6	F	Final presentations at the Double Tree Hotel	Proposal: Presentation (final; sent to instructor by 12 PM)
5/13	F	Meetings: student sponsor meetings	