

## NRSM 344 Ecosystem Science and Restoration Capstone

### SYLLABUS

Spring 2020

**Introduction:** This five-credit course is the planning course for the field learning experience for students in the Ecosystem Science and Restoration major (although it is also open to students pursuing other majors). It is designed to get students active in the field of ecosystem science and restoration through the application of ecological principles to management practice, creative participation in developing a research or project proposal, and through direct servicelearning. The course centers around two activities that are conducted in collaboration with a professional partner: 1) developing a capstone or thesis 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 scientists and to contribute in a meaningful way to real world projects.*

**Prerequisites:** Students must have completed at least one course in:

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

#### **Time and place**

- Wednesdays, 3:00-4:50 PM, Room TBD ○ Usually, the first hour will be lecture or structured discussion; the second hour will be student group meetings to discuss capstone projects.
- Fridays, 2:00-4:50 PM, DHC 023 ○ 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. Cara Nelson, Associate Professor, Department of Ecosystem and Conservation Sciences, College of Forestry and Conservation. Email: cara.nelson@umontana.edu. Phone: 406-2412478. Office: 460-C Clapp.

*Office hours:* Tuesday 3:30-4:20 PM and Thursday 10:00-10:50 AM. Please make an appointment if you would like to meet during office hours to ensure that Cara will be available to meet with you. If you are unavailable during office hours, other times to meet can be arranged.

**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.

**Service learning:** This course involves “service learning” -- a method of teaching and learning in which students, faculty and community partners work together to enhance student learning by applying academic knowledge in a community-based setting. Student work addresses the needs of the community, as identified through collaboration with community or tribal partners, while meeting instructional objectives through faculty-structured service work and critical reflection meant to prepare students to be civically responsible members of the community. At its best, service learning enhances and deepens students’ understanding of an academic discipline by facilitating the integration of theory and practice, while providing them with experience that develops life skills and engages them in critical reflection about individual, institutional, and social ethics.

Students will have three opportunities during the semester to share their service learning experience and reflect on their learning.

**Course format:** A variety of learning tools will be used, including lectures, field trips and peerlearning 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 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 event 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 for various aspects of the course. 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. Please dress and act professionally for these events. Contact instructors if you have any questions.

## **Assignments**

Consistent with five credits, this course requires an average of ten hours of work per week outside of class time. Please allow enough time in your schedule for course work. You will be asked to document what you did in the course every-other week throughout the semester.

Instructions for all assignments will be posted on UMBox, an on-line file-sharing site. A primer on using UMBox will be given during the first class.

(1) *Required reading* — Most reading in this course will be self-directed. There are three short, assigned textbooks.

- *Writing Scientific Research Articles*, Cargill and O'Connor (Wiley-Blackwell 2013), available in the bookstore.
- *The Master Communicators Handbook*, Erickson and Ward (Change Makers Books, 2015), available for loan in class.
- *Effective Ecological Monitoring*, Lindenmayer and Likens (CSRIO 2010). Cara has two copies of this book that the class can share or students can order through Amazon for \$44.00 ([https://www.amazon.com/Effective-Ecological-Monitoring-David-Lindenmayerebook/dp/B004YV7CSE/ref=sr\\_1\\_1?ie=UTF8&qid=1516813991&sr=8-1&keywords=effective+ecological+monitoring](https://www.amazon.com/Effective-Ecological-Monitoring-David-Lindenmayerebook/dp/B004YV7CSE/ref=sr_1_1?ie=UTF8&qid=1516813991&sr=8-1&keywords=effective+ecological+monitoring)).

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 UMbox. Students will be expected to answer questions about the readings during class discussion.

(2) *Restoration Plan Critique* — Students will independently critique restoration plans and submit a written evaluation (see assignment). Students will discuss their critiques in class.

(3) *Capstone Proposal* — Students will work individually or in teams to develop a research, restoration or monitoring proposal. This assignment will involve independent research and incorporate ecological theory, experimental design, land management practices, and budgeting. For students planning to enroll in *Ecosystem Science and Restoration Practicum* (NRSM495; required for the Ecosystem Science and Restoration degree) or for thesis credits, this proposal will form the basis of work done in these courses. Students will be given a choice of projects that are suitable for the course assignment. The process of interacting with 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 or thesis credits. There are no extensions for the final proposal.**

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

(5) *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 and submitting a final report.

**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) selfevaluation (5% of grade); and 5) Practicum or Thesis Proposal (individual or group assignment; at least 18 pages; four-five revisions; 65% of grade).

**\*\* 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.

There are 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, 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 the course instructor 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 Event	15%
Power analysis Report	5%
Capstone or Thesis Proposal	65%
<u>Self Evaluations</u>	<u>5%</u>
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 = ≥ 94%, A- = 90-93%	D = 60-69%
B+ = 87-89%, B = 84-86%, B- = 80-83%	F = <60%
C+ = 77-79%, C = 74-76%, C- = 70-73%	

**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.