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Spring 2018

## NRS 564 Placed-based Ecology II - Course Syllabus -

### I. General class information

#### Course credits

4

#### Class description

Life around us seems to pause during the winter season – lively green of summer fades and fall yellows and reds ensue, followed by snow covered landscapes; bird songs and humming insects become absent and everything feels cold. In this course we will explore how plants and animals manage the unique survival challenges of winter. During the first part of the course, we will delve into the fundamentals of winter ecology including the changing snowpack, life under the ice, plants and animals in the winter environment and plant-animal interactions. The second part of the course will focus on the snowpack and how it affects life in Idaho in a myriad of ways. In March we will travel to the Riggins area to witness the changes that springtime brings as the natural world awakens. In April we will prepare for our trip to Taylor Wilderness Research Station by studying ecology and management of mammals in the region.

We will use the outdoors as a classroom to gain hands-on knowledge and practical experience. Field experiences will be fundamental in your understanding of the ecology that surrounds us, we will take field trips to various locations to gain crucial insight into the natural world during the winter and spring seasons. Your outside experience and learning will be complemented by lectures, group discussions, readings, and field experiments. For the term project, we will ask you to track phenological changes throughout the semester through drawing, writing, and environmental monitoring data. At the end of the semester, you will present your term project to your peers and hand in a final assignment that summarizes the phenological changes you captured throughout the winter and early spring.

### **Specific learning objectives**

- Understand basic winter and spring ecological processes and principles
- Collect, analyze, and interpret ecological data
- Use and operate scientific equipment and software available at the McCall Outdoor Science School (MOSS) for ecological research
- Read, analyze, and discuss scientific literature

### **Aligning to UI learning outcomes**

- Learn and integrate – Through independent learning and collaborative study, attain, use, and develop knowledge in winter and spring ecology.
- Think and create – Use multiple thinking strategies to examine real-world ecological issues, solve problems, and make consequential decisions.
- Communicate – Acquire, articulate, create and convey intended meaning using verbal and non-verbal methods of communication that demonstrate respect and understanding in a complex society through discussing ecological research papers and writing a scientific research paper.

### **Contact information**

#### *Instructors:*

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Office hours: By appointment

Location: Spirit yurt and outside. Important: A substantial part of this class will be outside so please wear and carry appropriate clothing for the conditions.

### **Class website**

<http://ecosensing.org/teaching/nrs-564-placed-based-ecology-ii>

## **Grading**

Format: Lab report, inquiry presentations, mid-term exam, final project and presentation, in-class participation

Changing snow pack lab report: 10 points

Mid-term exam: 10 points

Hydrology presentation: 10 points

Botanical paper and presentation: 10 points

Term project:

    Final project: 40 points

    Final project presentation: 10 points

In-class participation: 10 points

Grading basis: A/F

A = 90 points, B = 80 points, C = 70 points, D = 60 points

## **Main text**

Marchand, P.J. 2013. Life in the Cold – An Introduction to Winter Ecology. Fourth edition. University Press of New England.

## **Slides**

If slides are used during lecture, they are available after the lecture to download from our class website <http://ecosensing.org/teaching/nrs-564-placed-based-ecology-ii/slides/>

## II. Class schedule

Day	Topic	Required readings	Important dates
1 (Jan 2)	Class introduction The changing snowpack	Chapter 2	Changing Snowpack lab report due Jan 16 at midnight MST
2 (Jan 4)	Plants in the winter environment	Chapter 3	
3 (Jan 8)	Animals and the winter environment	Chapter 4	
4 (Jan 10)	Plant-animal interactions: food for thought Wolverine presentation and telemetry	Chapter 6 and 7 Copeland et al., 2010 Introduction to GIS tutorial	
5a (Jan 16)	Snow Science Field day	Ian McCammon, <i>Avalanche News</i> , No 68, Spring 2004.  NY Times Tunnel Creek article: <a href="http://www.nytimes.com/projects/2012/snow-fall/#/?part=tunnel-creek">http://www.nytimes.com/projects/2012/snow-fall/#/?part=tunnel-creek</a>	
5b (Jan 23)	Snow hydrology of Idaho, Snotel trip with NRCS staff	TBD	
6a (Jan 30)	Life Under the Ice	Chapter 5 The lake is alive	
6b (Feb 6)	Life Under the Ice	Chapter 5 The lake is alive	
7a (Feb 13)	Snow hydrology of Idaho, Snotel trip with NRCS staff	TBD	
7b (Feb 20)	Snow Science Field day	Ian McCammon, <i>Avalanche News</i> , No 68, Spring 2004.  NY Times Tunnel Creek article: <a href="http://www.nytimes.com/projects/2012/snow-fall/#/?part=tunnel-creek">http://www.nytimes.com/projects/2012/snow-fall/#/?part=tunnel-creek</a>	
8 (Feb 27, Mar 6)	Phenology Project check in. Presentation of Snow Hydrology investigation		Mid term

9 (Mar 13, March 20)	Botany and Naturalist Field Day, Rapid River trail.	TBD	
10 (April 3, 10)	Research and Stories of Collected Plants	TBD	
11 (April 17, 24)	Mammal Ecology and Management		
11 (April 30-May 4, 7-11)	Field trip to Taylor Wilderness Research Station.  Topics: Place based ecology of Big Creek, Frank Church Wilderness  Presentation of term project		Final project presentation

### III. Assignments

#### Term project

You will track phenological changes throughout the semester through drawing, writing, and data. You will be asked to collect phenological observations, observe and use data collecting tools (e.g. snotel sites) and observe you own relationship to local ecological systems; then express all of your observations in a creative final product. Below is an example of the types of observations and data you may want to consider:

Date*	Tracks	Mammals	Plants (e.g., growth stage)	Birds	Air Temp	Soil Temp	Sap flow**	Time lapse	Stream flow	Snow depth	Ski days

## **Assignments**

**Snow science lab report:** On Jan. 2 after the morning lectures using snotel data sites you will form a hypothesis of what we will find in the snowpack when we go outside in the afternoon. This hypothesis must connect weather data to snow crystal type and location in the snowpack. The lab report will be made up of the stated hypothesis, a methods section describing in detail the methods you used; a results section and a discussion section describing whether or not your hypothesis was observed and what you found in the field.

**Hydrology presentation:** After learning about NRCS data collection and a field day of snow study at Brundage, you will be asked to make a short presentation about how the snow pack affects one of the following aspects of life in Idaho: Idaho Power and energy production, Department of Transportation and winter recreation, USDA and agricultural water usage, the McCall economy and impacts of snowpack size and structure.

**Botany Stories:** After the trip to the Riggins area, you will be asked to collect information about the plants that you find and collate stories about the plant structure, ethnobotanical uses and available scientific information. You will be asked to write a 1-2 page essay about the plants and then come prepared to tell the story of that plant in class.

## **Final Project**

The final project will be a summary of the phenological observations you have recorded throughout the semester. These can include some or all of the elements listed in the table above, if there are other observations you wish to include please do so. The goal of this project is to gain a deep understanding of phenological changes throughout the winter and spring to develop a multifaceted, deep rooted relationship with local ecosystems.

For the final project we would like you to have as much creative freedom as possible, hence the format is largely up to you. Some ideas might be a video, a podcast, a creative writing piece, a collection of art pieces, a song, a blog, or a traditional scientific report. Because of this creative freedom, you will be asked to get instructor approval and to present your progress to the group at the beginning of each class period listed on the class schedule. On that note our expectations will be 1) that you include ecological observations that you make throughout the semester and the phenological changes are expressed within your project, 2) demonstrate and express your own creativity in how you present your phenological observations. You will have to present your project to your peers when we are at Taylor Ranch. This presentation can take the format of your project, it can be verbal, visual or any sensory mix.

As noted in the class schedule above there will be time allotted each class period for you to give an update on your project. This will allow constructive faculty and peer feedback with the aim of improving your final piece.

For grading we will follow this scoring rubric:

Final project (40 pts):

Grading criteria	Max pts	Pts received
Creative manner in which phenological observations are presented	20	
Are the observations clearly organized and easy to follow?	5	
Thoroughness	5	
Are there clear links between observations and the local ecology?	10	
Total	40	

Final project presentation (10 pts):

Grading criteria	Max pts	Pts received
Creativity manner in which observations were expressed	2	
Were the presented observations clearly organized and easy to follow	1	
Did the presenter show enthusiasm for his/her work	2	
Did the presenter appear prepared	1	
Did the presenter appear to understand the material he/she presented	2	
Timing (length of presentation not much below or above 15 minutes)	1	
Delivery (e.g. clear voice, eye contact with audience, use of vocal fillers such as "um", "uh", and "like", effective use of body language)	1	
Total	10	

### Readings

Assigned readings should be done before class. You will be tested on the content covered in the readings during the midterm exam.

### IV. Midterm exam

The midterm exam will be on day 7 of class. You will be tested on topics we covered in class and that are covered in the assigned readings. For some more information about the final exam (e.g., format of final exam, example questions), please refer to <http://ecosensing.org/teaching/nrs-564-placed-based-ecology-ii/midterm-exam>.

## **V. General Notes**

*Reasonable accommodations are available for students who have documented temporary or permanent disabilities. All accommodations must be approved through Disability Support Services located in the Idaho Commons Building, Room 306 in order to notify your instructor(s) as soon as possible regarding accommodation(s) needed for the course.*

- 885-6307
- email at <dss@uidaho.edu>
- website at [www.uidaho.edu/dss](http://www.uidaho.edu/dss)

## **University of Idaho Classroom Learning Civility Clause**

In any environment in which people gather to learn, it is essential that all members feel as free and safe as possible in their participation. To this end, it is expected that everyone in this course will be treated with mutual respect and civility, with an understanding that all of us (students, instructors, professors, guests, and teaching assistants) will be respectful and civil to one another in discussion, in action, in teaching, and in learning.

Should you feel our classroom interactions do not reflect an environment of civility and respect, you are encouraged to meet with your instructor during office hours to discuss your concern. Additional resources for expression of concern or requesting support include the Dean of Students office and staff (5-6757), the UI Counseling & Testing Center's confidential services (5-6716), or the UI Office of Human Rights, Access, & Inclusion (5-4285).