

WELCOME TO COMMUNITY ECOLOGY—BIOLOGY 472/572
FALL 2014

INSTRUCTOR

Dr. Laurel Pfeifer-Meister

Office: 394 Onyx Bridge

Office Hours: Thursday 1:30 – 2:30 pm or by appointment

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Lecture: 8:30 - 10:50 am Tuesday/Thursday, room 106 Friendly

Optional Weekend Field trip: **Opal Creek, Sat. October 25th**;

LEAVE 8:30 am from Onyx Bridge Parking Lot, Return ~5:30 PM

Final Exam: 8:00 – 9:50 am **Monday December 8, 2014**

COURSE DESCRIPTION

Community ecology is a sub-discipline of ecology that studies the properties of species assemblages. The study of community ecology arose at the end of the 19th century as an attempt to understand the "balance of nature." Given the bewildering variety of species that can be found in a prairie, pond, or forest, naturalists were curious why there were repeated patterns of species composition and life form. Community ecology seeks to answer these and related questions.

The central questions of community ecology are:

- 1) How do communities form (i.e., what are the processes that allow species coexistence) and what causes communities to change?
- 2) How are communities organized (i.e., are there regularities in the structure of communities)?
- 3) What are the attributes of communities (i.e., how does one describe and compare communities) and what causes variation in these attributes?
- 4) What patterns do communities exhibit in space and time, and why?

We will explore these and related questions during this course. Community ecology is also a foundational science for many applied disciplines, including conservation biology, the study of invasive species, environmental management, and environmental engineering. We will have the opportunity to discuss examples of these applications during this course. The prerequisite for this course is BI 370 Ecology (or equivalent). Please check with me if you are missing the prerequisite. A course in Statistics is recommended, and courses in Calculus and/or Population Ecology (e.g., BI 471) are helpful.

ABOUT ME

I received my Ph.D. in biology studying community and ecosystem ecology. I currently split my time as an Instructor for the Department of Biology and as a Research Associate in the Institute of Ecology and Evolution. My research aims to understand the mechanisms that structure communities and how in turn, these communities can control ecosystem processes. In particular, my research has focused on how climate change, competition, disturbance (e.g., fire, restoration), succession, and edaphic and environmental factors control the distribution of native and introduced plant species as well as carbon and nutrient cycling. I use a combination of manipulative experiments (both field and laboratory) and analysis of natural gradients to address these basic ecological questions within an applied framework.

INSTRUCTIONAL MATERIALS

I will be assigning reading from a variety of sources. By 5:00 PM Friday, I will have posted the next week's readings and writing assignment on the class Blackboard site. Most of the readings will be available for download as pdf files. To read these you will need Adobe Acrobat Reader, free software that is installed on UO computers and can be downloaded from the following website: <http://www.adobe.com/products/acrobat/readstep2.html>. In addition to the readings, we will be working with two computer simulations. These will be available for download from our class Blackboard site. There is a textbook available for this course: Community Ecology by Gary Mittelbach. I will be assigning background reading from this text, and the course outline will generally follow the outline of the book. Two copies of the text are available on reserve in the Science Library.

LEARNING OUTCOMES:

I have two goals for Biology 472/572:

1. **Help you learn some of the central ideas in community ecology**— This course is not a panoramic overview of community ecology. Community ecology is a very broad and integrative science. In a 10 week course an overview could only be cursory. I feel strongly that as upper division and graduate students you will learn more if we take the time to explore in detail some of the major controversies and hot topics in community ecology.
2. **Help you continue your transition from student to *scholar*** — A scholar is someone who can think critically, argue logically, write clearly, and read effectively. Most importantly, a scholar understands how to organize and use knowledge, and takes responsibility for his/her own learning. My goal is to provide you with opportunities to practice all of these skills. Critical thinking involves using a variety of forms of information, synthesized logically, to solve a problem. Critical thinking is a key tool for any educated citizen of the planet, and is essential for a practicing scientist. It will be my job to give you a structured opportunity to practice critical thinking by interacting with the literature, your colleagues, and me. This means giving you readings and assignments that allow you to stretch your mental muscles a bit. A great way to practice critical thinking is to write out your argument—an idea that sounds great in your head may be less wonderful when down on paper. In this class, you will write short paragraphs and longer essays that ask you to synthesize and apply what you have learned. The primary literature remains the first front in the advance of science. The quantity of the literature is growing exponentially. Reading it *effectively* is a skill that can be learned and practiced.

ACHIEVING THESE GOALS

By now, 95% of your education has likely been structured around lectures. Lectures are good tools for downloading information. They require a particular dynamic. This dynamic, bluntly stated, is “professor professes, student writes it down.” Lectures, however, are not the most effective ways to learn how to engage the literature and to learn how to read and think like a scientist. Instead, we will use the following tools to work on these skills.

READINGS AND THE CASE METHOD— We will use the case method to dissect the readings. Through this analysis, we get to know the material by working with it, not by memorizing it. Thus, for a typical class you will be given a background reading, one or two readings from the scientific literature, plus some study questions. During the class period we will work our way through the readings to better understand the context of the research, its major findings, its flaws and strengths. We may do in-class exercises that will help us explore the ideas in the readings. These exercises may take the form of debates, small group discussion of a scientific question, a computer simulation, or other exercise.

ESSAY PARAGRAPHS — Some weeks, you will be asked to write a short essay on a study question or questions key to understanding that week’s topic. These essays are an opportunity to get some feedback on your writing and to engage with the material. In some cases, we will replace the essay questions with in-class computer simulations. In these cases, you will be asked to submit a series of answers along with the simulation.

RESEARCH PROPOSAL — You will have an opportunity to work with ideas from community ecology by writing a research proposal. I will give you a handout describing this assignment in more detail later. In brief, you will write a proposal in small groups for undergraduates (2 – 3 students) and alone for graduate students. You will begin by deciding (in consultation with each other and with me) on a topic for your proposal. You will then write a short literature review (1 – 2 pages) on your research topic, and craft a 5 page research proposal (including information from your review). Near the end of the term the class will be divided into two groups, and each group will read the other groups’ research proposals, write reviews of each, and choose the best proposal for “funding.” You will be given the reviews of your proposal and will have the opportunity to revise it before it is given a final grade. Your grade for the proposal assignment will be based on your literature review, your initial proposal, your participation in the review process (including the reviews you write), and your revised proposal.

Note: Graduate students may speak with me individually about alternatives to the proposal.

EXAMS — There will be two exams in this class: a midterm and a final. Both will be open book/open note and will consist primarily of questions you will have already encountered as study questions, or as questions posed in class. This is an opportunity for you to respond to the feedback on your essay paragraphs and to demonstrate your progress in understanding the material. The final exam is comprehensive but will emphasize materials after the second midterm. Make-up exams will be given for extreme cases only, with written documentation explaining the reason the exam was missed.

OPTIONAL FIELD TRIP — We will have one all-day optional field trip October 25th. We will be going to the Opal Creek Wilderness—the largest uncut watershed in western Oregon—which is east of Salem. We will hike a relatively flat 6.25 mile loop to Opal pool. The field trip will focus on the natural history of old growth forests in Oregon. Additionally, a member of the Opal Creek Ancient Forest Center will give our group a brief tour/introduction to the cultural history of this particular wilderness. Please dress appropriately for the weather and the hike (e.g., closed-toed shoes, long pants and warm clothing, layers are recommended, drinking water and meals/snacks, etc.). If you choose to come on the field trip, you may opt out of one of the weekly essay assignments.

LATE ASSIGNMENTS

10% will be deducted each day an assignment is late. Late proposals and proposal reviews **will not** be accepted.

ACADEMIC INTEGRITY AND DIVERSITY

I expect students to complete assignments and exams in a manner consistent with academic integrity. Students must produce original work and cite all relevant sources for ideas, quotations, etc. Academic dishonesty is a serious offense and will be treated according to the guidelines in the Student Conduct Code. Moreover, I expect students to adhere to the University's commitment to freedom of thought and expression of all its members by encouraging open inquiry and respecting a diversity of opinions in this course. Please refer to the Student Conduct Code for more information on the University's Academic Dishonesty Policy and Diversity Education: <http://uodos.uoregon.edu/>

UNIVERSITY OF OREGON'S ACCESSIBLE EDUCATION CENTER

At this University we do our best to facilitate and support accessible education. If there are aspects of this course that result in barriers to your learning and participation, I encourage you to contact me so that we can strategize solutions. If you have special needs, such as test accommodations, note-taking, and sign language interpretation, please contact the Accessible Education Center (AEC) so that their personnel and I can work together to help you learn comfortably in this class. The AEC office is located in 164 Oregon Hall. Telephone 541 346-1155. On the web: <http://aec.uoregon.edu/index.html> E-mail: uoaec@uoregon.edu

GRADE COMPOSITION

Weekly essay questions/in class activities – 30%
Proposal Topic & Literature Review – 5%
Proposal (First & Revised Draft) – 15%
Proposal Reviews – 10%
Midterm exam – 20%
Final exam – 20%

FINAL GRADE DETERMINATION

A+ = > 97%, A = 92.5 – 97%
A- = 89.5 – 92.5%, B+ = 87.0 – 89.5%,
B = 83.0 – 87.0%, B- = 79.5 – 83.0%
C+ = 77.0 – 79.5%, C = 73.0 – 77%
C- = 69.5 – 73.0%, D = 59.5 – 69.5%
F = < 59.5%

Final grades will be determined by performance and not effort. In-class participation is very important in a discussion-centered course such as this one. You will not be graded down if you choose not to participate, but I may increase your grade by up to half a grade for exemplary participation. **Each student is responsible for class-related work missed as a result of an absence; this work may be made up at my discretion.**

TENTATIVE SCHEDULE*

Date	Topic	Book Chapters	Assignments due
Patterns, Causes, and Consequences of Biodiversity			
Sep 30	What is community ecology?	1	
Oct 2	Biodiversity	2	Weekly Essay #1
Oct 7	Biodiversity cont.		Groups Selected
Oct 9	Biodiversity and Ecosystem Function	3	Weekly Essay #2
Species Interactions			
Oct 14	Predation & parasitism	5, 6	Proposal Topic
Oct 16	Predation & parasitism cont.		Weekly Essay #3
Oct 21	Interspecific competition	7,8	Literature Review
Oct 23	Competition cont. (Barnacle Zone)	SimUText	Computer Simulation
Oct 25	Optional Field Trip- Opal Creek		
Oct 28	Mutualism & Facilitation	9	
Oct 30	MIDTERM EXAM	1-3, 5-9	
Ecological Networks			
Nov 4	Community Networks and Food Webs	10,11	
Nov 6	Top-down Control	SimUText	Computer Simulation
Nov 11	Metacommunities; spatial ecology	12,13	
Nov 13	Metacommunities; spatial ecology cont.		Weekly Essay #4
Species in Changing Environments			
Nov 18	Succession & Disturbance	14	Proposals Due
Nov 20	Succession & Disturbance cont.	15	
Nov 25	Proposal Panels		Proposal Reviews Due
Nov 27	Thanksgiving Holiday- Enjoy!		
Dec 2	Community Assembly	15	Weekly Essay #5
Dec 4	Course Synthesis		Revised Proposal Due
Mon, Dec 8	FINAL EXAM, 8:00- 9:50 AM	Cumulative	

*This is a tentative schedule and will be adapted as necessary; MIDTERM and FINAL dates will not change.