Welcome to Community Ecology BI 472/572

About the Course

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Class hours and room: 10:00 – 11:50AM, Lawrence 254
Office Hours: By appointment

Prerequisites: 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.

Web Site: Our web site is accessible via the UO Blackboard server. Login requires your UO Information Services (Computing Center) email address and the corresponding password.

How I will contact you: All of my communication to you outside of class will take place via email. Specifically, I will use the email registered to you by the University of Oregon. If you use another ISP for your email, make sure you arrange to have your UO email forwarded to it, or arrange to change your registered email address with UO.

Required readings and assignments: There isn't a required textbook for this course. I will be assigning reading from a variety of sources. Some of the background reading will come from the book "Ecology: from Individuals to Ecosystems" by Begon, Townsend and Harper. I've chose this source because those of you who have taken BI 370 will already have a copy, and because it is the best reference book for ecology (although not a great book to teach from). If you don't have a copy, the UO bookstore stocks it. I have also put a copy on reserve.

By 12:00PM Friday, I will have posted the next week's readings and writing assignment on the class website. Some 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. Photocopies of the readings (or the original sources) will be on reserve in the Science Library by 1:00PM on Friday each week.

Course Goals

I have two goals for this course.

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.

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 their 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.

Strategy for 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 pretty lousy 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 in order 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. If necessary, I may select one or two students to read their essay paragraphs at the beginning of class in order to get the ball rolling.

Essay Paragraphs—For each class meeting, you will be asked to write a short essay on a study question or questions key to understanding that week's topic. These paragraphs are an opportunity to get some feedback on your writing and to engage the material.

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 groups of two or three 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.

Take-home exams — There will be two exams in this class: a midterm and a final. Both exams will be take-home exams and both will consist primarily (if not entirely) 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.

A word on my grading philosophy— This course is an opportunity to have some structured time in which to pursue the course goals. Students who show a good-faith effort (i.e., are prepared for class, turn in assignments, show progress, and contribute to discussions) can expect an A or B. Serious deviations from such a good faith effort will result in lower grades. To determine your grade, I will use the following weights: participation (25%), essays (25%), proposal (35%), and exams (15%). Midway through the course, I will present each of you with a mid-term grade report.

Important Deadlines

Groups assigned: January 16.

Proposal topic due: January 30.

Literature review due: February 13.

Midterm handed out: February 13.

Midterm due: February 20.

Proposal due: February 27.

Proposal reviews due: March 13.

Final handed out: March 15.

Revised proposal due: March 20.

Final due: March 23.

About Me

I joined the University of Oregon faculty in September of 2006, after 8 years on the faculty at Stanford University. My research group studies the community ecology of microorganisms (viruses, bacteria, archaea, and microeukarya), using a combination of laboratory microcosm experiments and field studies using molecular techniques. I am particularly fascinated with the diversity of microbial life and much of my research is focused on the causes and consequences of microbial biodiversity.

About Community Ecology

Community ecology is a subdiscipline of ecology that studies the properties of species assemblages.

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 each of these questions during this course.

Tentative course schedule

The topics on the tentative outline below are subject to change. The time schedule is just a guess -- we will take as long as needed on each subject.

Week	Day	Date	Topic	Subtopic
1	T	Jan. 9	Scope of CE	What is community ecology?
	Th	Jan. 11	Processes	Interspecific competition
2	T	Jan. 16	Processes	Predation, parasitism
	Th	Jan. 18	Processes	Facilitation, mutualism
3	T	Jan. 23	Processes	Habitat selection; nonequilibrium processes
	Th	Jan. 25	Processes	Nonequilibrium processes; evolutionary processes
4	T	Jan. 30	Structure	Trophic structure
	Th	Feb. 1	Structure	Succession
5	T	Feb. 6	Structure	Metacommunities
	Th	Feb. 8	Structure/Attributes	Co-occurrence; species composition
6	T	Feb. 13	Attributes	Biodiversity I
	Th	Feb. 15	Attributes	Biodiversity II
7	T	Feb. 20	Attributes	Biodiversity III; community phylogenetics
	Th	Feb. 22	--	No class (work on proposals)
8	T	Feb. 27	Patterns	Intro to major patterns
	Th	Mar. 1	Patterns	Equilibrium explanations – traditional macroecology
9	T	Mar. 6	Patterns	Nonequilibrium explanations – neutral macroecology
	Th	Mar. 8	Patterns	Evolution in communities – temporal macroecology
10	T	Mar. 13	Student-led session	Discussion of proposals
	Th	Mar. 15	Synthesis	The future of CE