Syllabus for Ecology (Biology 305)

Pacific University, Fall 2014

Professor Stacey Halpern

Welcome to Ecology! Ecologists study the relationships between organisms and their environment, and how these relationships shape the natural world. That world is complex, however, which can make it challenging to determine what causes the patterns we see. Practicing ecologists use several tools to tease out ecological causes, including natural history, observations, theory, verbal and mathematical modeling, computer simulations and experiments. A focus of this course it to help you develop many these skills. Ecology also has strong connections to many important applied questions, ranging from pest management in agriculture to conservation of threatened species, from public health policies on infectious diseases to global climate change. Throughout the course, we'll examine ways ecology can help us better manage these issues.

This course will not always run as a typical lecture course; you often will need to apply information and ideas to problems inside and outside of class. I've designed the course this way because I'm committed to creating a class that facilitates your learning and helps you practice skills you'll use in life and in your career as a biologist—whether that's in health care, teaching, research, farming, public policy, or any other application of biology. **For you and the class to succeed, you must come to each class, and you must come prepared to participate.** Preparation may include completing assignments ahead of time, and always means having a calculator with you.

Course goals

I have designed this course to help each student achieve several goals. **By the end of the course, students will be able to:**

1. Quantitatively analyze a novel ecological example (using math models, statistics, graphs, and other tools) and provide a sophisticated explanation of the example that relates data to concepts.
2. Use concepts and data to predict the response(s) of populations, communities, and ecosystems to natural and anthropogenic environmental changes.
3. Conduct an ecological study, including identifying a question, designing appropriate methods, and analyzing and interpreting results.
4. Make policy or management recommendations based on application of basic ecological principles and data to questions related to conservation, resource management, agriculture, or health.

Basic course information

- We meet in Strain 216 MWF 10:30-11:35 am for lecture and 1 – 4 p.m. on Thursdays for lab. For field labs, come prepared to work outside in any weather.
- text website: http://sites.sinauer.com/ecology3e/ (visit this site for some assignments)
- course website: on Moodle. Check to be sure you're enrolled.
- There may be activities in class for which you earn points; if you miss class that day, you will miss those points. Note "dropping your two lowest scores" for this component in the syllabus section on assessment.
- Catalog course description: *An introduction to the basic principles and fundamentals influencing interactions between plants and animals and their environment. Includes laboratory and field experiences.*

How to reach me

I enjoy talking with students and forward to interacting with you this semester! Visit with any questions.

Office location: **Strain 209**

Office hours: **M 11:45-12:30, Th 9:30-10:30 am, F 12:30 – 1:30 pm.** If I have to adjust office hours to observe other faculty teach (part of my Department Chair responsibilities), I will notify you. If my office hours don't work for you, please make an appointment!

e-mail: **shalpern@pacificu.edu**. I check e-mail frequently during the day and will respond as soon as I can.

Mail: I have a mailbox in the natural sciences office, **Strain 102**.

Telephone: **503-352-3109** (extension 3109 if you're calling from campus). Although you can leave a voice-mail any time, e-mail is a more reliable way to reach me.

How I will reach you I will use your Pacific e-mail address to send out occasional but important course information, so check this account regularly or arrange to have messages forwarded to an account you use.

Texts & Required Readings

Cain, M. L., W. D. Bowman, and S. D. Hacker. 2008. *Ecology 3rd* ed. required

This text provides an excellent introduction to many of the key ideas and studies in ecology. It has great case studies, and provides a concise overview of many important concepts and recent advances in the field. There are several ways to get it, including purchasing a standard book, a loose-leaf version, or an e-book version. Any is acceptable.

Gotelli, Nicholas J. 2008. *A Primer of Ecology*, 4th edition. recommended

Gotelli provides really clear explanations of the mathematical models we'll cover in this class, and then some. He also has practice problems for each chapter. Good for studying for exams, especially in the first two-thirds of the course. I put a copy of this on reserve in the library.

Pechenik, Jan A. 2007/10/13. *A Short Guide to Writing About Biology*, 6th or later edition. recommended

This book is very helpful guide to writing in the biological sciences—it's a great reference for all your biology courses, and will remain useful if you continue in biology after Pacific. If you haven't written science reports (e.g., lab reports) in biology before, I strongly recommend using it as a resource. You will also use it in other biology courses at Pacific.

Journal articles. *Handed out in class, or distributed via Moodle*

On occasion, I'll assign readings from the primary literature. I'll announce these assignments in class, and will post PDFs to the course Moodle site.

My expectations for you in this course

- I assume that all students enrolled in this class are adults who take responsibility for their education. I will work hard to facilitate your learning, but ultimately only you can actually learn the material through focused time and effort. As a reminder, Pacific guidelines state that to pass a class, students should expect to put in 2-3 hours outside of class for every credit; that means you should expect to work at least 8-12 hours/week on this course outside of class and lab time.

- I also assume that all students in this course are interested in the topic, either because they're biology majors or because they are already interested in ecology. I will strive to encourage your enthusiasm for biology, and for ecology in particular.

- For each class and lab, I expect you to come prepared; to participate cheerfully in activities; and to act in a respectful, professional, and responsible manner. In turn, you can expect the same from me. If you feel uncomfortable in class for any reason, please let me know—I'm always available for these conversations.

- Please be on time for class and lab. Our time is valuable, and I will start both promptly.

- If you know you will miss class (e.g., for an approved, scheduled event), please let me know ahead of time. College notices are not sufficient—you must discuss these absences with me before hand.

- As part of respectful behavior in class, please be certain to turn off all cell phones during class and lab. Do not text during class or lab. Also, do not leave class or lab to answer a cell phone call. If you have a valid reason to have your cell phone on—e.g., a family emergency in progress—please let me know and I will accommodate that situation.

Assessment of learning and grades
I will assess your learning in this course in a variety of ways, including written reports and papers, in-class exams, problem sets, other homework, in-class graded activities, and active participation in class and lab.

Important note: You must save all returned assignments until the end of the course. If I request to see a graded assignment or exam again and you cannot return it to me, you may receive a zero for that assignment or exam.

Assessments: Total of 650 points for the course

- ***Exams*** (350, 54%)

Exams will be a mixture of short answer, data interpretation, problem solving, and essay questions. The final exam will be cumulative, but will focus on the second half of the course. I will provide more information on exams at least one week before they occur.

- 2 midterms (100 points each)
- final (150 points)

- ***Problem sets, case studies, and other class assignments*** (130 points, ~20% approximately half as problem sets)
  - Problem sets: I design the problems to help you prepare for calculation problems on the exams, and to practice key quantitative skills (which we will also do in class)
  - You will have (nearly) daily in-class and/or on-line activities. These will include reading quizzes on Moodle to prepare for class; interpreting data from ecological studies in class or via Moodle; or doing practice problems or calculations in class or via Moodle. In addition to giving you opportunities to practice skills in a low-stakes setting, they will help you prepare for exams, where you will be asked to solve quantitative problems and interpret data or figures for some questions. In some cases, I will grade a single assignment for your group. Your two lowest scores are dropped; there are no make-ups for these assignments.

- ***Lab assignments*** (170 points, ~26%)

To practice planning studies, analyzing data, and presenting the results, there are several lab reports and proposals. These assignments are described in more detail in the lab syllabus.

- ***Participation in lab and class***
  I may adjust your grade up or down ½ a grade for exceptionally good or poor participation in class and lab. The standard expectation for participation includes:
  - *active engagement with in-class activities (including small-group discussions, case studies, in-class problems, and discussions of readings) and turning in individual or group assignments related to these activities on time. You cannot make-up points if you miss class; you are allowed 2 absences over the semester without penalty (with accommodation for extraordinary circumstances including prolonged illness).*
  - *attending all labs, and arriving on time. If you are tardy, we may leave without you!*
  - *staying on task during class & labs. Many of the sampling techniques are time-intensive, and it often takes time to drive to our site. Please stay focused to help us finish labs on time.*
  - *working well with your lab and classmates on projects, discussions, and other activities*
  - *having a positive attitude in class and especially lab. I love field biology and I hope you will too, but even I find that working outside is sometimes uncomfortable. We'll all enjoy the work and each other more if we strive to be cheerful.*

Important information on assignment grading:
Following directions (e.g., formatting for reports) and meeting deadlines are important to me; assignments that do not meet these requirements will be penalized. Assignments are due at the time noted in the syllabus or on the assignment handout. Some assignments may be submitted via e-mail or Moodle. They must be submitted by the time deadline associated with the due date. Printed assignments must be turned in at the beginning of class; if you are late to class, the assignment will be considered late and will receive a penalty. I will accept late assignments except homework problems with an automatic penalty of 10% per day (24 hour periods, weekends included). **I will not accept assignments more than three days late without prior approval.**

Obviously I can make accommodations for extraordinary situations (e.g., hospitalization, family emergency, etc.). Please let me know about emergencies in a reasonable time frame; college policy usually requires you to document these circumstances with the Dean of Students. If you have a planned, approved absence (e.g., off-campus athletic competition, performance, interview, etc.), please let me know ahead of time.

Grades Final grades will be assigned based on the percentage of the total points you earn, following this breakdown:

Final grade	Percentage	Final grade	Percentage	Final grade	Percentage
A	93% and higher	B-	80-82%	D+	67-69%
A-	90-92%	C+	77-79%	D	63-66%
B+	87-89%	C	73-76%	D-	60-62%
B	83-86%	C-	70-72%	F	less than 60%

Academic Honesty
Pacific University has no tolerance for academic misconduct/dishonesty. It is university policy that all acts of misconduct and dishonesty be reported to the Associate Dean for Student Academic Affairs. Sanctions that may be imposed for such misconduct range from an "F" for the assignment, an "F" for the course, and suspension or dismissal from the university. Forms of academic misconduct include but are not limited to plagiarism, fabrication, cheating, tampering with grades, forging signatures, and using electronic information resources in violation of acceptable use policies.

For this course, the Academic Code of Conduct includes proper attribution of ideas and information in written assignments and completing all individual work on your own. Academic honesty does not preclude discussing ideas with other students, studying together for exams, working on problem sets together, or providing feedback on lab write-ups **as long as all text is in your own words. Follow directions when making figures for lab carefully—sometimes you may share them, and sometimes you must make your own. I will provide guidelines for figure sharing guidelines with each assignment.**

Please talk to me before you turn in assignments if you have a question about what constitutes dishonesty.

College resources
There are many services available at Pacific to help you succeed in your courses. I encourage you to take advantage of them! I can help connect you with these resources, including academic and non-academic support services. Some of these services include:

- Tutoring and Learning Center (TLC) The TLC is located in Scott Hall. The center focuses on delivering one-on-one and group tutoring services for math and science courses and writing skills in all subjects. Students should consult with the center's director for information on tutoring available for other subjects. Day and evening hours; walk-ins welcome!
- Student Counseling Center The counseling center offers individual counseling, crisis services, referrals, and workshops. They also have information on-line or in their office about issues such as stress management and sleep. 503-352-2191, Mon-Fri 9 a.m. – 5 p.m., http://www.pacificu.edu/studentlife/counselingcenter/

Reasonable accommodations for students with disabilities
If you have documented challenges that will impede your learning in any way, please contact our LSS office in Clark Hall (ext.2107). The Director or Assistant Director will meet with students, review the documentation of their disabilities, and discuss the services that Pacific offers and any appropriate ADA accommodations for specific courses.

To receive accommodation, you must make arrangements with me at least 1 week prior to the due date or exam.

Creating an effective learning environment
I strive to create a comfortable, interesting learning environment for everyone, and I welcome feedback on my teaching or the course.

Schedule of Topics and Readings

The schedule below summarizes readings and major assignments for the course. It is subject to change as the course unfolds. I will announce any adjustments to reading and other assignments in class, so bring your schedule with you to record these changes. If you are absent from class for any reason, you are responsible for checking with other students or me to get information announced that day.

Before class, I recommend skimming texts (i.e., reading section headings and outlines) except for specific pages or figures referenced in Moodle quizzes or exercises. Carefully read texts after class. When reading, focus on material we discuss during class. In particular, look for (and learn) additional examples of concepts we discuss.

Key to reading assignments: CBH = Cain, Bowman, and Hacker *Ecology* text; G = Gotelli *Primer* text (on reserve, not required)

Wk	Dates	Topic/Class activities	Readings	Assignments due	Lab
Populations					
1	Aug 25 - 29	Introduction to Ecology	CBH: Ch. 1, p. 23-24	Wed: Turn in signed form for course	Intro to Stream Macroinverts
		Ecological niches,	CBH: p. 23-24, Concept 4.1 (p. 85-88), Ch. 9		
		Introduction to populations	CBH: Ch. 9, Concept 10.3		
2	Sept 1 – 5	Populations: Exponential model & age structure	CBH: Ch. 10 through Concept 10.3 (start with 10.3, then go back to 1 & 2) G: "To the Student" p. xix–xx; 2–14, 20-22, Ch. 3 except p. 67-71	Fri: Stream macroinverts proposal	Human demography
3	Sept 8 - 12	Populations: Logistic model	CBH: Concept 10.4, Ch. 11 G: p. 26-37, 41-47	Mon: Problem set #1	Stream macroinverts
4	Sept 15 – 19	Metapopulations	Review CBH Concept 11.4, G. Ch. 4 (only topics we cover in class)	Mon: Human demog lab report Fri: Problem set #2	Herbivory I
		Populations: life history evolution	CBH: Ch. 7, G: p. 69-71, review CBH: Ch 6 if you need an evolution refresher		
5	Sept 22	**Mon: EXAM 1**		**Mon: EXAM 1**	
Species Interactions					
	Sept 24 – 26	Competition	CBH: Ch. 12 G: Ch. 5 (skip section on intraguild predation)	Wed: Herbivory proposal	Herbivory II
6	Sept 29 – Oct 3	Competition	Continue readings from last week		Herbivory data analysis
		No class Friday—break			
7	Oct 6 – 10	Predator-prey	CBH: Ch. 12 G: Ch. 6	Mon: Problem set #3	Stream macroinverts
8	Oct 13 – 17	Predator-prey	CBH: Ch. 12 (cont.)	Th: Herbivory report	Stream macroinverts lab day
		Parasites & disease	CBH: Ch. 13		
9	Oct 20 – 24	Parasites & disease	CBH: Ch. 13 (cont.)	Wed: Problem set #4	Stream macroinverts analysis
		Species interactions: Mutualism	CBH: Ch. 14		
10	Oct 27	**Mon: EXAM 2**			
Communities & Ecosystems					
	Oct 29 – 31	Characterizing communities (including succession)	CBH: Ch. 16, 17 G: p. 204-213, 217	Th: Stream draft report	Forest ecology I
11	Nov 3 – 7	Community diversity gradients	CBH Ch. 3 (biomes—skim), Ch. 18, Ch. 19	Th: Peer review of stream report	Forest ecology II

Wk	Dates	Topic/Class activities	Readings	Assignments due	Lab
12	Nov 10 – 14	Consequences of diversity Trophic structure in communities: Wolf case study **No class Friday--conference**	CBH: Concept 19.4 CBH: Concept 5.1, 5.2, 20.1; Ch. 21	Wed: Problem Set #5 Th: Stream final report	Forest data analysis
13	Nov17-21	Energy and nutrients in ecosystems: Pollution and global change ecology	CBH: Ch. 2, Ch. 22, Ch. 25 (except Concept 25.4)		Global Change Big Data
14	Nov 24	Pollution and global change ecology continued	(reading continues from week 13)	Mon: Big data report	no lab
	November 26 – 28 Thanksgiving break—no class				
15	Dec 1	**Last day of class** Wrap up	(reading continues from week 13)		no lab
	Dec 10	**FINAL EXAM, 8:30 – 11 am**			

Ecology Contract of Understanding, Fall 2010 Turn in Aug 27

I have read the syllabus completely and understand course requirements. I also understand the course policies, including those regarding academic honesty, late assignments, and keeping all graded work. I recognize that it is my responsibility to seek clarification regarding any aspect of the syllabus, the course requirements, or the grading policies if they are unclear to me.

Signature: _____ Date: _____

Name (printed): _____+

Student Information This information helps me tailor the course to your background.

e-mail address: _____ **Year** So Jr Sr

Major: _____ **Minor (if you have one)**: _____

Other courses this semester (names, please)

Previous upper division biology courses and science courses—check ones you've taken

__ Research methods	__ Junior Seminar	__ Animal Behavior	__ Marine Biology
__ Evolution	__ Galapagos	__ Tropical Rainforest	__ Vertebrate Zoology
__ Principles of Development	__ Plant Biology	__ Animal Physiology	__ Microbiology
__ Cell Biology	__ Cancer Biology	__ Genetics	__ Molecular Biology
__ Immunology	__ Conservation Biology	__ Toxicology	__ Organic Chemistry

__ Other: list

In which of these biology classes have you written formal lab reports or carried out projects you designed (in part or full)? What other experience do you have with independent research, if any?

Previous college math classes—circle the classes you have you taken:

statistics (which one?) _____ linear algebra calculus (what level?)_ software tools (CS 130)

other(s)

Please circle any of the following library/database tools that you feel comfortable using:

JStor Biosis Web of Science ILL (interlibrary loan) Summit

Extracurricular activities this term

Career goals or dream job, if known (or possibilities, if you have several ideas)

(over)

Do you have any concerns about this course? If so, how can I help you overcome them?

Are there any topics you particularly hope to learn about in this class?