

ECOLOGY LECTURE (BI 406-01) & LABORATORY (BI407-11)

FALL 2005

Lecture- Fischer 316, TTH 10:00-11:35; Lab- Fischer 224, M 1:00-4:00

PROFESSOR- Dr. Alissa Packer

OFFICE- Fischer 206A

OFFICE HOURS- MW 9:00-10:00, W 1:30-2:30

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WHAT IS ECOLOGY?

Ecology is the study of interrelationships between organisms and their biotic and abiotic environments. As a basic science, ecology informs us about the processes governing the patterns we observe in nature. From an applied perspective, it is critical that we understand ecology as it provides insights and solutions to many of the environmental issues that we are confronted with in our daily lives.

COURSE GOALS:

My goals in this course are 1) to introduce you to the complex ways in which living organisms interact with one another as well as their physical environment, 2) to introduce you to the sub-disciplines of ecology, which are often characterized by the level of biological organization (i.e. physiological ecology, population biology, community ecology and ecosystem ecology), and 3) to encourage critical thinking through the readings, discussions, and written assignments.

LEARNING OBJECTIVES:

Upon completion of this course you should be able to:

- understand how organisms interact with their abiotic and biotic environment and how these interactions affect the distribution and abundance of species
- identify patterns in nature, pose meaningful hypotheses to explain those patterns, and design sound ecological experiments to test your hypotheses,
- collect, analyze and interpret data generated from your experiments, and relate your own work to other relevant literature in the field
- present your original research in both oral and written format
- understand and evaluate primary literature in ecology

COURSE STRUCTURE:

We will use the *lecture periods* to become grounded in the conceptual and theoretical background that serves as a foundation for the current study of ecology. This will be accomplished in two ways: 1) through discussions of major ecological concepts presented in the textbook, and 2) through discussions of articles from the primary literature and the popular media that focus on relevant ecological issues. We will operate more like a seminar than a traditional lecture course. You will be responsible for contributing to class on a daily basis. Additionally, each student will lead a discussion of an article from the primary literature once during the semester. In order to participate effectively in class, you will need to read (and think about) all assignments before coming to class.

WHY READ THE PRIMARY LITERATURE?: Ecologists study the natural world through observation and experimentation. By reading and discussing articles from the primary ecological literature, we examine how ecologists generate and interpret data, and contextualize their own work within a larger conceptual framework. Reading the primary literature also allows us to examine how original research is generalized and translated into textbooks.

In the *lab*, we will gain a more thorough understanding of ecology through first-hand observation and experimentation, primarily in field habitats. This will be your opportunity to carry out real ecological experiments. The research experience will not consist of “cookbook-style” exercises with predetermined “correct” answers. Instead labs will be centered on broad research questions and we will work together to develop testable hypotheses.

NOTE: You should come to labs dressed to do field work. This means you should be wearing sneakers or hiking boots, old clothes, etc. In the case of bad weather, we will most likely still be going in the field. Come prepared!

COURSE READINGS:

- ◇ Ricklefs, R.E. (2000). *The Economy of Nature*, Fifth Edition, W.H. Freeman & Co., New York.
- ◇ Pechenik, J.A. (2003). *A Short Guide to Writing About Biology*, Fifth Edition, Longman, New York.
- ◇ Other readings: To be posted on E-Res.

POINT DISTRIBUTION:

Lecture

Exams (3)	45%
Paper.....	30%
<i>Annotated bibliography</i>	5%
<i>First draft</i>	
<i>Edit & revise</i>	5%
<i>Peer review & revise</i>	5%
<i>Final draft</i>	15%
Article presentation/discussion.....	10%
Article review.....	5%
Portfolio.....	5%
Participation/Class assignments.....	5%

Lab

Asking ecological questions.....	10%
Mark-recapture paper.....	15%
Demography worksheet.....	10%
Forest ecology paper.....	20%
Mimicry questions.....	10%
Self-designed experiment.....	20%
Experiment presentation.....	10%
Participation.....	5%

GRADING SCALE:

A: 93-100%	B-: 80-82.9%	D+: 67-69.9%
A-: 90-92.9%	C+: 77-79.9%	D: 63-66.9%
B+: 87-89.9%	C: 73-76.9%	D-: 60-62.9%
B: 83-86.9%	C-: 70-72.9%	F: <60%

ATTENDANCE: You should notify me in advance, if possible, when you have a legitimate reason for missing a class. Attendance will be taken into account in your class preparation/participation points. If you have more than 3 unexcused absences in lecture you will not receive any points, therefore your final grade will drop by 5%. Six or more absences in lecture may result in failure in the course. EACH unexcused absence in lab will result in a letter reduction in your final grade. You will not be permitted to make up any assignments that were missed during an unexcused absence.

MAKE-UP EXAMS: Make-up lecture exams will be given only in extreme circumstances. They will require written documentation from the Dean of Students. Anyone who fails to comply with these procedures will receive a zero for missed exams.

LATE ASSIGNMENTS: All assignments will be collected at the *beginning* of class on the due date. Late assignments will be downgraded by 10% for each day late unless prior arrangements have been made.

ACADEMIC DISHONESTY: Academic dishonesty of any kind will not be tolerated. The University policy on cheating, plagiarism and all other forms of academic dishonesty can be found at www.susqu.edu/campus_center/handbook/academic_honesty.pdf. All violations of will be dealt with as outlined by University procedure.

SPECIAL CONSIDERATIONS: If you require special assistance or consideration to accommodate a condition that may affect your performance in this course, please inform me of your need at the beginning of the semester or at the time you become aware of your need for assistance. From that point forward, any reasonable and necessary accommodations will be implemented.

COURSE SCHEDULE: Below is a tentative schedule that is subject to change as the semester progresses. Attending every lecture is the best way to stay informed of changes to the syllabus. You are responsible for finding out about any information that you may have missed due to an absence.

DATE	TOPIC	TEXTBOOK READING	OTHER READING	ASSIGNMENT DUE
M 8/29	<i>Patterns in the living world: asking & answering ecological questions (Ecology Research Center, Selinsgrove)</i>			
T 8/30	What is ecology?		*Wilcove & Eisner, <i>The impending extinction of natural history</i> *Leopold, <i>Prairie birthday</i>	
TH 9/1	Introduction to the field & challenges of ecological research	Ricklefs, Ch. 1	Blaustein & Johnson, <i>The complexity of deformed amphibians</i>	
M 9/5	<i>Do insect population densities differ with vegetation type? A mark/recapture expt.</i>	<i>Ricklefs, Ch. 13</i>		
T 9/6	Introduction to ecological research- MEET IN LIBRARY		*Nagle, <i>Reading and writing biological lit.</i> *Pechenik, pp. 1-9 & 130-134	<i>DUE: Patterns exercise</i>
ECOLOGY OF ORGANISMS- ECOLOGY OF ORGANISMS- ECOLOGY OF ORGANISMS				
TH 9/8	Adaptations to life in varying environments	Ricklefs, Ch. 2 (pp. 39-45) & Ch. 9		

M 9/12	<i>Do insect population densities differ with vegetation type? A mark/recapture expt.</i>	Ricklefs, Ch. 2 (pp. 39-45) & Ch. 9		
T 9/13	Adaptations to life in varying environments		READING	
TH 9/15	Life histories & evolutionary fitness	Ricklefs, Ch. 10	Pechenik, Ch. 6 on article critique	
M 9/19	<i>Cemetery demography</i>			
T 9/20	Life histories & evolutionary fitness	Ricklefs, Ch. 10	READING	
TH 9/22	Behavioral Ecology	Ricklefs, Ch. 12		
M 9/26	<i>Cemetery demography</i>			<i>DUE: Mark-recapture paper</i>
T 9/27	Behavioral Ecology		READING	Summary & critique of article
TH 9/29	EXAM 1			
ECOLOGY OF POPULATIONS- ECOLOGY OF POPULATIONS - ECOLOGY OF POPULATIONS				
M 10/3	<i>Introduction to local tree species & sampling techniques (Shade Mountain)</i>			<i>DUE: Demography worksheet</i>
T 10/4	Population growth & regulation	Ricklefs, Ch. 13		
TH 10/6	Temporal & spatial dynamics of populations	Ricklefs, Ch. 15	READING	
SPECIES INTERACTIONS- LINKING POPULATIONS & COMMUNITY ECOLOGY				
M 10/10	<i>Forest ecology data collection</i>			
T 10/11	Introduction to species interactions	Ricklefs, Ch. 17		
TH 10/13	Predation and herbivory	Ricklefs, Ch. 17		
M 10/17	NO CLASS			
T 10/18	NO CLASS			
TH 10/20	Dynamics of predation	Ricklefs, Ch. 18	READING	
M 10/24	<i>Forest ecology data analysis/ Begin mimicry experiment</i>		<i>Williams, Mimicry</i>	
T 10/25	Interspecific competition			
TH 10/27	Interspecific competition	Ricklefs, Ch. 19	READING	
M 10/31	<i>Mimicry experiment</i>			

T 11/1	Mutualisms	Ricklefs, Ch. 20		
TH 11/3	EXAM 2			
ECOLOGY OF COMMUNITIES- ECOLOGY OF COMMUNITIES- ECOLOGY OF COMMUNITIES				
<i>M 11/7</i>	<i>Analyze mimicry data</i>			<i>DUE: Forest ecology paper</i>
T 11/8	Community structure	Ricklefs, Ch. 21		
TH 11/10	Feeding relationships	Ricklefs, Ch. 21	READING	
<i>M 11/14</i>	<i>Self-designed experiment</i>			
T 11/15	Community development	Ricklefs, Ch. 22		
TH 11/17	Succession	Ricklefs, Ch. 22	READING	
<i>M 11/21</i>	<i>Self-designed experiment</i>			<i>DUE: Mimicry questions</i>
T 11/22	Biodiversity	Ricklefs, Ch. 23	READING	
TH 11/24	NO CLASS			
<i>M 11/28</i>	<i>Self-designed experiment</i>			
T 11/29	Complexity & stability			
TH 12/1	Ecosystems ecology			
<i>M 12/5</i>	<i>Presentation of experiments</i>			
T 12/6	Ecosystems services		READING	
TH 12/8	Ecological application	Ricklefs, Ch. 25	READING	Self-designed experiment paper due