50.351 -- ECOLOGY
Spring 2008

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Course Description
Ecology is the scientific study of organisms and their environment. Ecology encompasses a broad spectrum which includes the study of behavior and physiology, population dynamics, community interactions, and ecosystem function. Because ecologists study large-scale phenomena, mathematical modeling is used extensively. The mathematical models are representations of the working of the natural world. Building, testing, and modifying models are the focus of basic ecological research. In addition, ecologists are increasingly called upon to provide information on environmental problems and to help formulate solutions based on sound science.

In this course, you will learn the fundamental ecological models, including their mathematical basis. You will explore some of these models with computer simulations. In addition, you will practice evaluating hypotheses with experimental evidence from your own investigations and from the primary literature. You will also gain a greater understanding of the process of science by participation in independent projects. Finally, you will apply ecological principles to real-world problems and make suggestions for courses of action.

Some of the "lecture" portion of this course will be spent working in teams. Work in teams allows for greater participation, discussion, and involvement with the course material. Consistent attendance in class is necessary to take full advantage of these learning opportunities. In addition, some of the in-class work is graded and contributes to the course grade.

Written assignments are an important part of this course. Writing is a skill that can best be developed through practice. Although content is the major component in good writing, appropriate grammar, spelling, and sentence and paragraph structure are also necessary for the effective communication of ideas. In this course, you will practice writing in the style of the scientific community.

Required Textbook and Supplies
Gotelli, N. J. 2001. A primer of ecology, 3rd ed. Sinauer Associates, Sunderland, Massachusetts.
Schmitz, O. J. 2007. Ecology and ecosystem conservation. Island Press, Washington, DC.
EcoBeaker workbook. 2007. SimBiotic Software, Ithaca, New York.
Write-in-the-Rain waterproof field notebook

Course Evaluation
Your course grade will be based on your performance on three exams, team work, four EcoBeaker computer exercises, lab work, and independent field projects according to the following formula:

exam 1	100
exam 2	100
final: exam 3 + comprehensive	150
team work	80
EcoBeaker exercises	80
lab reports	80
independent projects	160
total possible points	**750**

Your earned points will be converted to a letter grade using this scale:

points earned	**grade**	**points earned**	**grade**
698-750	A	578-599	C+
675-697	A-	548-577	C
653-674	B+	525-547	C-
623-652	B	503-524	D+
600-622	B-	450-502	D
		<450	E

Exams will include definitions of ecological terms and essay questions drawn from an exam review sheet. The exam review sheet will be available one week before the scheduled exam date.

Grades for team work will include graded assignments completed in class (60 points) and points allotted by other team members (20 points) for preparation, team participation, and contribution to the learning of team members.

The EcoBeaker software is installed on the Specialized Software PCs in the library and the KUB Games Room (232). The library is a better location to do the exercises because the computers are in carousels with room for the workbook, notes, etc. In the library, the specialized computers are on the third floor on the far end away from the stairs and elevator and overlooking the parking lot and Student Rec Center. In the Games Room, the specialized computers are located in the middle of the lab and have a "Specialized Software PC" sticker. You will need your university user id and password to log on to a computer. You can start EcoBeaker from the Start menu under Specialized Software. The EcoBeaker workbook includes instructions for each exercise and questions to complete. Your answers to the questions will be graded.

Grading of lab reports and independent projects is described on the last page of this syllabus.

Deadlines are real; 10% of the possible points for an assignment will be deducted for each day it is late. Exceptions for extreme circumstances (e.g., death in the family) must be requested in a timely fashion. There may be opportunities to earn extra credit for attending lectures by outside speakers; the instructor will announce qualifying lectures in class.

Communication
As stated in PRP 3408 Student Use of University Assigned Email Accounts, you are responsible for all messages and attachments sent to your bloomu.edu e-mail account and items posted on Blackboard. You should regularly check your e-mail and Blackboard, blackboard.bloomu.edu.

LECTURE SCHEDULE AND READING ASSIGNMENTS

DATE	TOPIC	READING
15 January	the science of ecology	Schmitz chapter 1
17 January	the science of ecology	Schmitz chapter 2
22 January	climate-template for global biodiversity	Schmitz chapter 3
24 January	climate-template for global biodiversity	
29 January	climate-template for global biodiversity	
31 January	ecological limits and the size of populations	Schmitz chapter 4 Gotelli chapters 1-2
5 February	ecological limits and the size of populations	
7 February	ecological limits and the size of populations *EcoBeaker Isle Royale due*	
12 February	human populations	
14 February	competition	Gotelli chapter 5
19 February	**EXAM 1**	
21 February	competition	
26 February	predation	Gotelli chapter 6
28 February	community interactions *EcoBeaker Prairie Sampling due*	
4 March	viability of threatened species	Schmitz chapter 5 Gotelli chapter 3
6 March	viability of threatened species	
18 March	viability of threatened species	
20 March	biodiversity and habitat fragmentation *EcoBeaker Niches and Competition due*	Schmitz chapter 6 Gotelli chapter 7
25 March	biodiversity and habitat fragmentation	
27 March	biodiversity and habitat fragmentation	Gotelli chapter 4
1 April	**EXAM 2**	
3 April	web of life: connections in space and time	Schmitz chapter 7
8 April	web of life: connections in space and time	
10 April	ecosystem services	Schmitz chapter 8
15 April	ecosystem services	
17 April	protecting biodiversity and ecosystem function *EcoBeaker Keystone Predator due*	Schmitz chapter 9 Gotelli chapter 8
22 April	protecting biodiversity and ecosystem function	
24 April	the good of a species	Schmitz chapter 10
7 May	**FINAL EXAM**; 1:00-3:00	

LABS AND INDEPENDENT PROJECTS

Field-based labs and projects are an integral part of the Ecology class. During the semester, labs and projects will introduce you to a variety of ecological topics and techniques. This semester, we will focus specifically on two communities: a forest and a freshwater stream.

To ensure your safety, you must be properly attired for field and lab activities. Proper field attire includes long pants, socks, and sneakers/boots to limit contact with poison ivy (very abundant) and rough vegetation. We will go into the field regardless of the weather so be prepared for possible precipitation and unpleasant temperatures. You will not be allowed to participate in any exercise without proper attire, and you will not receive credit for missed exercises.

DATE	TOPIC	LOCATION
15, 16 January	lab 1: lichen growth	campus and lab
22, 23 January	introduction to stream ecology	Montour Preserve
29, 30 January	lab 2: stream ecology	Montour Preserve
5, 6 February	independent project—stream ecology	Montour Preserve
12, 13 February	independent project—stream ecology	Montour Preserve
19, 20 February	independent project—stream ecology	lab
26, 27 February	independent project—stream ecology introduction to forest ecology	lab Wood Hollow
4, 5 March	lab 3: forest ecology	Wood Hollow
18, 19 March	independent project—forest ecology	Wood Hollow
25, 26 March	independent project—forest ecology	Wood Hollow
1, 2 April	independent project—forest ecology	lab
8, 9 April	independent project—forest ecology	lab
15, 16 April	lab 4: acid mine drainage	Jeddo Mine Tunnel
22, 23 April	lab 4: acid mine drainage	lab

The listed lab exercises serve as an introduction to ecological research in general (lab 1) and to the two communities we will study in depth (labs 2 and 3). In addition, lab 4 allows us to do ecological research on a heavily human-impacted ecosystem. Each listed lab exercise includes a lab report worth 20 points.

You will do two independent field projects, one on stream ecology and one on forest ecology. For each project, you will design the study, collect and analyze data, and prepare a written report and presentation of your results. For each project, the grading will be 10 points for the proposal, 30 points for the first submission of the written report, 15 points for its second submission, and 25 points for the presentation (poster presentation for stream ecology, oral presentation for forest ecology).