

WIP: GENERAL ECOLOGY SYLLABUS- LECTURE AND LAB
BIOL 305, 4 credits, Fall 2009

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Office Hrs: Mon.-Thurs., 2:30-3:30 p.m. *Other appointments also available.*

Class Hours: Mon. & Wed. 11:00 a.m. – 1:50 p.m.
Class meets in S-308 *unless otherwise announced.*

Textbooks: Cain, Bowman and Hacker. 2008. Ecology. Sinauer publishing. ISBN 978-0-87893-093-8
McMillan, Victoria E. 2006. Writing Papers in the Biological Sciences. Boston
MA: Bedford-St. Martins. ISBN 0-312-44083-9

Course Description: An introduction to the basic concepts of ecology. Study of the factors/interactions that determine the distribution and abundance of species at the individual, population, community, and ecosystem levels. You will satisfy the writing intensive requirement by writing in a variety of discipline-specific formats. Lecture, laboratory, and fieldwork, with up to two field trips scheduled on a Friday, Saturday, or Sunday. Prerequisites: BIO 150, BIO 202, and ENGL 101. Recommended: ENGL 102. *This course has been approved as a Writing Intensive course as part of the Writing Intensive Program (WIP). Successful completion of this course fulfills the Writing Intensive graduation requirement for biology majors who entered the university in Fall 2008 or later. Speak to your advisor or visit <http://www.neiu.edu/~wip> for more information.*

Learning outcomes:

- 1) Understand major ecological theories and the questions from which they were developed. Critique data that support and contradict those ecological theories.
- 2) Propose solutions to today's environmental problems based on ecological data. Be able to identify ecological theories from examples from natural ecosystems or laboratory experiments and draw conclusions or propose a course of action based on those theories.
- 3) Use mathematical models to provide information about and predictions about ecological data.
- 4) Based on observations and theories, develop an ecological question and design an appropriate protocol to collect data to address that question.
- 5) Collect and graph data; use basic statistics to analyze data.
- 6) Search the primary literature, read and evaluate primary research articles, and compare data from those research articles to data obtained during field and laboratory exercises.
- 7) Write proficiently in a variety of discipline-specific formats, including field/lab notebook, graphs in multiple formats, and a primary research paper with abstract, introduction, methods, results, discussion, acknowledgements, and literature cited sections.

Attendance and Punctuality: Attendance at every lecture, lab, and field trip is required. Laboratory, field trips, and in-class assignments account for a large number of points that can only be obtained if you are present. In addition, if you think about it, there are only 4-5 lectures before each exam. Missing only one lecture means that you miss 20-25% of the material on an exam. It is difficult to teach material to yourself, so students who miss class generally perform poorly on exams. *If you must be absent, I must be notified in advance. You may be required to write a 5-page paper (with references) as a make-up assignment.* Otherwise, you will not be able to make up the points that you missed. Please make it a priority to arrive on time. Late arrivals are disruptive. If, by arriving late, you miss a crucial component of a lab, field, or in-class writing exercise, your grade for that exercise will be penalized.

Exam Material: Exams will consist mostly of essay questions with some short-answer questions. You must understand how different topics relate to one another. The exams will not only test whether you know the material, but your ability to use what you know to solve problems. You will be required to interpret data presented in graphs and tables. Take-home essay questions will be included in some exams.

Make-ups & due dates: Make-ups for exams will only be allowed in the case of a documented illness (doctor's note required) or other documented emergency. Assignments must be turned in on time- a grade for an assignment will be penalized 10% for each calendar day it is late.

Required Reading: You have an excellent textbook that explains concepts clearly. You will do much better in this class if you regularly complete the required reading assignments *before lecture*. Have you ever had the experience of going to lecture and not understanding a word? That won't happen if you read in advance!

Scientific Writing: Excellent writing skills are crucial to success in science and in almost any career. Writing is being emphasized more and more at NEIU. You will write in a variety of discipline specific formats, including 1) Field/lab notebook, 2) Primary research paper with abstract, introduction, methods, results, discussion, acknowledgements, and literature cited sections, 3) Graphs of data, 4) Visual aids to support an oral presentation, and 5) Persuasive letter. The purpose is to gain experience writing in standard scientific formats, as well as improve general writing skills.

Writing practice: Writing is a skill like any other- it improves with practice. There will be multiple opportunities to practice writing *without* having to worry about a grade. Although these practice assignments won't be graded, you will obtain credit for completing many of them. For example, a practice essay question will be posted on Blackboard each week. Other practice writing activities will take place during class, so you must be present in class to obtain those points.

Finding, Reading, and Understanding Scientific Research Papers: The ability to find, read and interpret scientific research papers will help you in any scientific career. You will expand upon your literature searching skills and compare data obtained during lab and field exercises to data published in the scientific literature. The purpose is to make you comfortable and confident when searching and evaluating the scientific literature.

Student research project: An exciting opportunity in this class is to design and conduct your own research project. In groups of 2-4, you will create a research question based on ecological observations or theories, design an appropriate sampling protocol, collect samples, analyze the data, and compare your data to the larger scientific literature.

Pre-lab assignments: Before many laboratory and field exercises, you may be required to complete a short pre-lab assignment that will prepare you for the day's exercise. Pre-lab assignments are crucial because they ensure that you and your lab partners are familiar with the goals and activities of the day's activity, making lab run much more smoothly.

Field Trips: There will be several outdoor field exercises, some of which may be on a Fri., Sat., or Sun. You will be outdoors for several hours. I suggest wearing pants, long sleeves, and gym shoes (no sandals), even if the weather is hot, to protect yourself from poison ivy and insect bites. Wear clothes that can get dirty. Bring sunscreen, insect repellent, and an umbrella. Field trips will not be cancelled due to cold weather or light rain- only if there is lightning or dangerous conditions. Check Blackboard Announcements on the morning of a field trip if you suspect it may be cancelled.

Use of computers: Knowledge of computer programs such as Word and Excel will help you complete assignments for this course. The Student Client Support Office has online tutorials at <http://www.neiu.edu/~scs> (click on “Tutorials” on the left panel).

Blackboard and NEIU e-mail address: I will frequently post handouts, changes to the course schedule, your grades, etc. on Blackboard and may require that you turn in assignments through Blackboard. *It is your responsibility to regularly check Blackboard as well as your NEIU e-mail address.* According to NEIU policy, e-mail correspondence related to university business should be conducted through NEIU e-mail addresses.

To access Blackboard, login to NEIUport at <http://neiuport.neiu.edu> and click on the Blackboard link. **If you have difficulty, bypass NEIUport by using the direct link to Blackboard, <http://neiu.blackboard.com/>** Login using the same NetID and password that you would use for NEIUport. If you don’t know your NEIUport NetID and password, follow these steps.

1. Go to <http://neiuport.neiu.edu> and click on “Look up your NetID and Email address.”
2. If you don’t know your NetID, click on “Forget your NetID?”
3. Type your NetID into the box. Then click “What is my password?”
4. Problems? Go to <http://www.neiu.edu/~scs> for trouble-shooting tips or call 773-442-4230.

A Note on Original Work: You are expected to adhere to the University Student Conduct Code (<http://www.neiu.edu/~DeanSt/survival/conduct.pdf>). We will all be working very closely together in class discussions and in lab and field exercises, where group efforts are a must. However, when individual efforts are called for (e.g. exams and writing assignments) – they must be accomplished alone. Keep in mind that plagiarism is a serious offense. Even copying a phrase or sentence, without quote marks and a source reference, whether that phrase or sentence is from a lab partner, book, article, or the internet, is plagiarism. We will discuss plagiarism, and how to avoid it, in detail.

Please understand that it is never worthwhile to conduct an honor violation. Infractions are sad, because they show that a student doesn’t believe in his or her ability to perform well. Dishonesty can ruin a career; it is crucial to be in the habit of always conducting honest work. *Any violation to the Code of Student Conduct (such as cheating or plagiarism) is grounds to fail the course. The violation will also be referred to the Office of the Dean of Students and additional sanctions may be imposed by the university.*

GRADING: 90-100% (450-500 points)=A; 80-90% (400-449 points)=B; 70-80% (350-399 points)=C; 60-70% (300-349 points)=D; below 60% (299 points or lower) = F

Exam 1: 15 of the points for take-home essay question(s)	75 pts.
Exam 2: 15 of the points for take-home essay question(s)	75 pts.
Cumulative Final Exam	100 pts.
Lab/Field Notebook	80 pts.
Primary Research Paper <i>Draft</i>	25 pts.
Primary Research Paper <i>Final Submission</i>	50 pts.
Oral presentation (10 of the points for preparation of effective visual aids)	15 pts.
Persuasive Letter	15 pts.
Variety of short writing assignments (e.g. field site descriptions, analysis of published research paper)	Total of 40 pts.
Completing writing practice activities	Total of 25 pts.
TOTAL	500 pts.

SCHEDULE, FALL 2009

Modifications will be announced in class and posted on Blackboard. All reading materials that are not from the textbook will be available in the library or posted on Blackboard. Additional reading assignments will be added.

WK.	CLASS	TOPIC & DUE DATES OF MAJOR WRITING ASSIGNMENTS	REQUIRED READING
1	Lecture	Introduction to ecology & course expectations Nutrient Supply & Cycling	Chapters 1 & 6
	Lab	Analyze parts of a primary research paper.	Effect of Management Burning on Prairie Insect...
2		<i>No class- Labor Day holiday</i>	
	Lab	Field trip to Gensburg-Markham Prairie. Literature search & analysis of published research paper due.	
3	Lecture	Coping with Environmental Variation: Temperature, Water, & Energy. Example: Wetland Ecosystems. Field site description due.	Chapters 4 & 5.
	Lab	Applied ecology: Principles of Wetland Ecology applied to sewage treatment.	Biological Treatment of Wastewater
4	Lecture	Population Ecology: Life History Analyses Population Distribution & Abundance	Chapters 7 & 8
	Lab	Life Table generation. Persuasive letter (draft) due.	
5	Lecture	Population Growth & Regulation; Population Dynamics	Chapters 9 & 10
	Lab	Population growth curves with <i>Lemma</i> . Competition experiment between <i>Lemma</i> and <i>Spirodela</i> plants. Field/lab ntbks. due.	
6	Lecture	EXAM 1	
	Lab	Develop an ecological question and design an appropriate protocol to test that question. Searching the primary literature. Ntbks. due.	
7	Lecture	Competition. Persuasive letter (final) due.	Chapter 11.
	Lab	Field trip: Collect samples from Mary Mix McDonald Woods (Chicago Botanical Gardens)	
8	Lecture	Predation & Herbivory	Chapter 12.
	Lab	Analyze samples collected from field trip. Field/lab ntbks. due.	
9	Lecture	Parasitism, Mutualism, & Commensalism	Chapters 13 & 14
	Lab	Analyze samples, cont.; create graphs of data, statistically analyze data. Field/lab ntbks. due.	Introduction to Statistical Analysis.
10	Lecture	The nature of communities; change in communities	Chapters 15 & 16
	Lab	Oral Presentations	
11	Lecture	Species diversity in communities; Energy flow & food webs. Primary research paper (draft) due.	Chapters 18 & 20
	Lab	Soil ecosystems. Use a dichotomous key to identify soil invertebrates; calculate biodiversity indices.	Soil biodiversity & ecosystem functioning
12	Lecture	EXAM 2	
	Lab	Nutrient cycling I: Nitrogen	
13	Lecture	Nutrient Supply & Cycling. Primary research paper (rewrite) due.	Chapter 21
	Lab	Nutrient cycling II: Carbon cycling & CO ₂ sequestration. Ntbks. due.	A guide to CO ₂ Sequestration.
14	Lecture	Conservation Biology	Chapter 22
	Lab	Mathematical models: Landscape Ecology I. Field/lab ntbks. due.	
15	Lecture	Landscape Ecology & Ecosystem management. Primary research paper (optional second rewrite) due.	Chapter 23
	Lab	Mathematical models: Landscape Ecology II	
16	Lecture	Global Ecology. Field/lab ntbks. due.	Chapter 24
		CUMULATIVE FINAL EXAM	