

BIO 150: Introduction to Biological Inquiry- Prairie Restoration
Fall 2009

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Office hours: Mondays 11-noon
Tuesday 2-3 PM
Wednesday 8-9 AM
Thursdays 10-11 AM
Friday 9-10 AM

Please consult [my online calendar](#) contact me for appointments at other times. *I tend to read and reply to email at the beginning and the end of the day, so call or drop by my office if you need an immediate response to a question.*

Staff: Sue Kolbe, Biology Department Lab Technician, kolbe@grinnell.edu
Larissa Mottl, Conard Environmental Research Area Manager, x4717 mottll@grinnell.edu
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TA's: Matthew Nielson (nielsenm@grinnell.edu)
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COURSE DESCRIPTION

As a way to explore how biologists ask questions and develop answers to them, this class will focus on the biology of the prairie and the problems of prairie restoration. It will be taught in "workshop" format at Grinnell College's Conard Environmental Research Area (CERA), where we will use the prairie and savanna restorations as our laboratory. You will be required to formulate research questions based on your reading of the literature, design experimental or observational studies to test your hypotheses, and report on their findings in written and oral forms.

A note about the philosophy of this course: The primary goal of this course is to help you understand to how biologists ask questions, test their ideas and communicate them. Our method to achieve this goal is *total immersion*. Given that scientific knowledge is constantly changing, our philosophy is that the best thing we can do for you is to help you develop the intellectual tools to evaluate statements by scientists, or even to recognize when you use scientific thinking in your daily life. Unlike conventional courses, we have no defined set of topics we are required to "cover" by the end of the semester. However, this does not mean that facts (i.e., results of observations) and theories are unimportant! Rather, we hope to demonstrate that they are crucial to good science and its application to the rest of our lives. *See the attached statement about Bio 150 for background on how all sections of Bio 150 are related to each other.*

This new way of teaching introductory biology was funded by a grant from the National Science Foundation. One of our obligations for this grant is to determine how well these techniques work to help students learn. We appreciate your participation in these assessment activities. Your responses will remain confidential.

COURSE REQUIREMENTS

Meetings: On most Mondays and Wednesdays (*in bold on schedule below*), we'll be traveling to the Conard Environmental Research Area (CERA), Grinnell College's biological field station. **On these days we'll leave PROMPTLY at 1 PM in front of the Science Building. Don't be late or you'll be left behind!** We'll arrive back at 4:05 PM. On Fridays and other days we don't go to CERA, we'll meet in Science 1823 at 1:15 pm, unless otherwise announced.

Because of the need to concentrate on fieldwork before the coming of winter weather, we will be busy and outdoors during much of the beginning of the course. Later in the semester we will have more time to consider what we learn from restoring prairies and to work on the public products of our investigations. The general outline for the course is below, with travel days to CERA or elsewhere **IN BOLD**:

Week	Monday	Wednesday	Friday
1			28-Aug Introduction
2	31-Aug Intro to prairies and CERA	2-Sept Vegetation sampling (CERA)	4-Sept Lecture/Discussion
	6-Sept Special Sunday Field trip to prairie remnants	9 am – 3 pm	
3	7 Sept Vegetation sampling (CERA)	9-Sept Data analysis	11-Sept Lecture/Disc.
4	14-Sept Peer review	16-Sept Fire experiment at CERA -- Paper due	18-Sept. Lecture/Disc.
5	21-Sept – Sample Fire experiment (CERA)	23-Sept Data analysis	25-Sept Lecture/Discussion
6	28-Sept <i>Oral presentations</i>	30-Sept Independent projects (CERA)	2-Oct Lecture/Discussion
7	5-Oct Independent projects (CERA)	7-Oct Independent projects (CERA)	9-Oct Lecture/Discussion
8	13-Oct Independent projects (CERA) Project Proposal due	14-Oct No class	16-Oct Midterm exam
9	26-Oct Independent projects (CERA)	28-Oct Independent projects (CERA)	30-Oct Lecture/Discussion
10	2-Nov Independent projects (CERA)	4-Nov Independent projects (CERA)	6-Nov Lecture/Discussion
11	9-Nov Independent projects (CERA)	11-Nov Independent projects (CERA)	13-Nov Lecture/Discussion
		12-Nov (evening) – 150 Project Discussions	
12	16-Nov Project analysis	18 Nov -- Project analysis and writing	20 Nov -- Lecture/Discussion
13	23-Nov Project analysis and writing	25-Nov No class	27-Nov No class
14	30-Nov Peer Review <i>Project paper 1st submission due</i>	2-Dec Peer review	4-Dec <i>Final project paper due</i>
15	7-Dec Poster prep	9-Dec No class <i>Poster session Dec 10 11AM-1PM</i>	11-Dec Final Discussion
Final	Thursday Dec 17 9 am		

Each Friday, I will be giving you assignment sheets with details on reading assignments and study questions that will help you prepare for class. These can also always be found on the Class Web Page. Guidelines for papers, peer reviews and oral presentations will be given to you well in advance of the assignments. Late papers will be accepted with a penalty of one letter-grade/24 hours. Penalty-free extensions will be given in the case of illness documented by the health center. *Please let me know in advance if you need to miss class because of a conflict with an extracurricular or other activity. I will try to make reasonable accommodations, but not at the last minute.*

Texts: There are two required texts, *Biological Science Vol. 2* (3rd Edition) by Scott Freeman, *Tallgrass Prairie Wildflowers* by Ladd and Oberle, and *Konza Prairie* by O.J. Reichman. Unfortunately, the last text is backordered at the publishers. I have put a copy on reserve in the Science Library, or you can try to buy a used copy from a student here or from on-line dealers (*barnesandnoble.com* or *amazon.com*). We will also be reading a number of other short articles, which will be on reserve in the Science Library or available electronically through the class website.

Supplies: Aside from appropriate field attire, you should purchase at least one sturdy, waterproof field notebook from the bookstore.

Grades will be based on the following assignments:

Vegetation Analysis Paper		10%
Fire Experiment Oral Presentation	(group)	10%
Midterm exam		15%
Project Proposal	(group)	5%
Project paper	(group)	20%
Peer Review		5%
Project Poster	(group)	10%
Notebooks and homework		5%
Final Exam		20%

Notice that 45% of your grade depends on grades for group work. Exam questions will gauge your ability to use biological terms correctly, explain major ideas from the readings, interpret data and propose tests of hypotheses. If you do not do the assigned readings before coming to class, participate in class, and practice writing about the ideas after class, you will do poorly on the exams! Exam questions from previous years are available on the class website.

Letter grades will be determined in the following manner:

93-100% A	87-90% B+	77-80% C+
90-93% A-	83-87% B	70-77% C
	80-83% B-	60-70% D
		< 60% F

However, you must have an average of >70% on the individual assignments (the vegetation paper, the two exams, homework and the peer review) to receive a C or better in the course. I do not use a grading curve because I believe it discourages students from working together. I encourage you to form study groups or work with me on the subject matter of the course. I will consider improvement over the semester and good class citizenship (e.g., being prepared, participating in class discussions, asking good questions) in determining your final letter grade. If you are worried about your performance in the class,

please come talk to me during office hours. *I have very high expectations of you – and nothing is more important to me than helping you reach and surpass them.*

Safety: When we are at CERA, you may be working in remote areas where I'm not present. If this occurs, make sure you know where your group members are at all times. In case of emergency, I will carry a cell phone (641-275-0937), as does Bob Groenendyck (641-990-3108). *If you have a medical condition that I should know about in order to react appropriately in the field, please let me know. In particular, you should let me know if you are hypersensitive to stings from Hymenoptera (i.e., bees and wasps).*

Disability accommodation: I am personally committed to making reasonable accommodation for all documented disabilities. Please don't hesitate to speak with me early in the semester if you have such documentation. If you don't, but wish to obtain it, contact Joyce Stern in the Academic Advising, who can consult with you on the process. My goal is to make my classroom challenging and welcoming of every person.