

**Biology/Environmental Studies 4193 (4 Credits)-
Experimental Ecology Laboratory (Writing Intensive)**

Fall 2007

Fridays—12:00-7:00 PM

Instructors: Jon Chase, Jean Burns, Kevin Smith

TA: Wade Ryberg

Course overview: This course will focus on the design and interpretation of ecological experiments. We will cover a variety of concepts that you should be familiar with from your previous ecology courses, and we will work on a variety of organisms in a variety of ecosystem types. Each lab will emphasize hypothesis testing, sampling methodology, and data analyses. As the course goes on, labs will become more complex, and students will play a larger role in the design and interpretation of the experiments. The final ~1/3 of the class will be devoted to independent projects; students will work closely with instructors to devise a project, execute it, analyze the data, and prepare a final paper.

Grading: There will be no exams. Grading will be based on written laboratory reports and project proposal/presentation (33%), class attendance and participation in discussions (33%), and written final independent projects (33%). In science, writing is an essential tool, and you must learn to do so effectively and carefully. Thus, for both lab reports and independent projects, grading will be based on your ability to communicate (write) your research, as well as the technical details of your work. As this is a writing intensive course, students will be given ample comments and opportunity for revisions, and grading will be based on improvement.

Readings: For most lab periods, we will require readings from the primary literature. For reports and the final paper, you will be expected to perform your own literature reviews (from Web of Science and other searches). The text for the course is Day and Gastel (2006) “How to write and publish a scientific paper”, which will serve as an essential reference for writing.

Special Notes:

-This course will be intensive and in depth. Because much of the grade is based on participation, attendance is mandatory. We will allow one excused absence if necessary (but you will be responsible for getting and analyzing the data), but any more than that will result in lost points for that class period.

-Most of the early part of the class will take place in the field, and you will get dirty and encounter some unpleasant things (e.g., ticks). We will also be hiking up and down considerable slopes, wading in ponds/streams, and the like. Come prepared by dressing

appropriately. Wear long-pants, hats, and good walking shoes (with socks if you want to minimize ticks). Don't wear anything you particularly care about (e.g., nice watch, jewelry). Bring a backpack for your supplies—you need to supply your own water, snacks, sunscreen, and whatever else you might need (we will supply bug-spray).

–We will not stop work because of inclement weather—wear appropriate clothing (e.g., raingear).

–Once we leave the parking lot, there will be limited access to bathrooms—go before we leave, and be prepared to use the woods.

Date

Topic

August 31* Interactions of pollination and herbivory

Experiment: Effects of simulated herbivory on pollinator behavior, pollination success, and floral morphology

Analysis: t-test/One-way ANOVA

Write-up: Methods/Results (due 9/7)

**Note, this is an overnight trip, and we will not return until Saturday afternoon*

September 7 Top-down vs. Bottom-up forces in stream food webs

Experiment: Interactive effects of nutrient resources and fish predators on invertebrate and insect abundances

Analysis: Two-way ANOVA

Write-up: Introduction (due 9/14)

September 14 Edge effects and nest predation

Experiment: Evaluating edge effects on nest predation risk using artificial nests and camera traps.

Analysis: Regression

Write-up: Discussion (due 9/21)

September 21 Fire and forest succession

September 28

Experiment: Forest succession and effects of long-term differences in fire frequency

Analysis: Markov-chain/matrix models

Write-up: Full paper (due 10/5)

October 5

Assessing fitness using foraging ecology

Experiment: Use techniques of optimal foraging to assess habitat-specific fitness differences. Students will design and implement experiment.

Analysis: To be determined by students

Write-up: Full paper (First draft due 10/19, Second draft due 10/26)

October 19 **Fall Break (No Class)**

October 26 **Protist stuff**

Experiment: Introduction to microcosms and research on protists in 'model ecosystems'

November 2* *Weekend Field Trip to the Ozarks/Project proposals*

–Written proposals due/proposal presentation and discussion

**Note, this is an overnight trip, and we will not return until Saturday afternoon*

November 9 *Independent project setup*

November 16 *Independent projects*

November 23 **Thanksgiving—No class**

November 30 *Independent project takedown*

December 7 *Final project presentations*

December 14 *First draft of final paper due*

December 21 *Final draft of final paper due*