

Practical Skills (EnSt 393)
McDonnell 412
W 5-7 pm

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Office Hours: By appointment

Course web site: <http://www.nslc.wustl.edu/courses/Bio393/bio393.html>

Goals and course overview: This course will serve the primary purpose of providing you with the background you will need to conduct basic ecological research. We will address several of the most important facets of designing and executing biological research, including identifying and properly defining your research question, designing a study to address your question, collecting, organizing, and analyzing your data, and interpreting and presenting your results. We will also apply a substantial amount of time and effort to the process of writing research grants, which for some of you may culminate in the submission of a research proposal to the Biology Dept./Howard Hughes Medical Institute Summer Undergraduate Research Fellows program or for Tyson Research Fellowships or internships. (These fellowships and internships are competitive, and enrollment in the course does not guarantee funding.)

Specific course goals:

1. Learn how to ask and address important (and interesting) questions in environmental biology and ecology
2. Learn and apply the skills necessary to design and complete a research project
3. Learn and apply data management, analysis, interpretation, and presentation
4. Gain experience in grant proposal writing and reviewing
5. Have fun with mud and ticks

Field Trips

Two Mandatory field trips are required for this course. (1) Amphibian sampling (to occur at night) and (2) Garlic mustard management. Several dates will be available for each of these field trips, to be announced.

One additional field trip (optional): Glade burning, Feb 9th.

Course material:

Required text: *How to Do Ecology: A Concise Handbook* (2006), Karban and Huntzinger, Princeton University Press.

Recommended text: Krebs. Ecology

Additional reading assignments from the primary literature and other sources will be posted online and distributed by email.

Course Syllabus

*****Extremely Subject to Alteration*****

Week	Date	Topic	Reading
1	Jan 16	Organizational information and course introduction. Expectations for the course and future opportunities. Goals for the course (survey). What is Ecology?	Required: What is Ecology? Krebs Recommended: May 1999, Unanswered questions in ecology
	Jan 22 6:30-8 PM	HHMI Information Session http://www.nslc.wustl.edu/Research/HHMI/surf.html	
2	Jan 23	Research philosophy, asking good questions, designing studies to answer your questions. Discussion: how would you answer this question? Homework: come up with a question that interests you	<i>How to Do Ecology</i> , Chapter 1-3 (pg. 1-59)
3	Jan 30	The primary literature, Using web of science Fill out proposal template/outline Or, write a series of ideas (3-4) and outline your approach(s) to answering them. Homework: work on proposal outline (2 page max.)	PDF: “Developing your conceptual framework and significance statement.”
4	Feb 6	Proposal Outline Due to Mentors (or ideas/approaches worksheet). What makes a good proposal? Student review of example proposals	
	Feb 9	Glade restoration field trip	
5	Feb 13	Proposal Draft Due to Mentors Field trip this week? (Contingent on the weather)	
6	Feb 20	Proposal Draft Due to Class Homework: read and evaluate peer proposals	
	Feb 22	SURF/HHMI application deadline http://www.nslc.wustl.edu/Research/HHMI/surf.html	
7	Feb 27	Peer review of proposals and discussion	
8	Mar 5	Work on proposals	
	March 7	HHMI and Tyson Proposals Due	

9	Mar 12	Spring Break	
10	Mar 19	Choosing analyses based on your question and design Introduction to data management Formatting data in Excel Data analysis	<i>How to Do Ecology</i> , Chapter 4 (pg. 60-81)
11	Mar 26	Data analysis, cont. Manuscript review & discussion	
12	Apr 2	Tips on Data presentation: Tables and Figures	<i>How to Do Ecology</i> , Chapter 6 (pg. 88-129)
	Apr 5	Saturday field trip-Garlic Mustard experimental management	
13	Apr 9	Tips on posters and presentations	<i>How to Do Ecology</i> , Chapter 6 (pg. 88-129)
14	Apr 16	Tips on manuscript/paper/report writing	<i>How to Do Ecology</i> , Chapter 6 (pg. 88-129)
15	Apr 23	“Career day.” Grad school and other options for ecology careers. Recommendation letters: how and who to ask.	<i>How to Do Ecology</i> , Chapter 5 (pg. 81-87)

Additional Resources:

Literature research:

Web of science: <http://portal.isiknowledge.com/portal.cgi?DestApp=WOS&Func=Frame>

Google scholar:

<http://scholar.google.com/>

Ingenta connect:

<http://wustl.library.ingentaconnect.com/>