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BIOL 413.01: Field Ecology

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Field Ecology Syllabus--Spring 2000

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Raison d'être: This course is designed for students who are aspiring field research biologists. The emphasis is on **doing** field science, not on learning about the natural history of an area. The course provides students the opportunity to: (1) choose and address a meaningful question to investigate, (2) designing a way to get at the question and to work toward the development of alternative hypotheses to explain some pattern in nature, (3) conduct the necessary field research independently, (4) analyse the data in a quantitative and statistically valid manner, and (5) describe the project in written and oral formats.

Course components:

Selection of a research problem.--A good field biologist can pick up on patterns that others would never have found on their own, but even a beginner at this game will be amazed at the number of questions he/she can uncover after a single day in the field. Finding a question is not difficult; finding a non-trivial and tractable research question is, however, the hardest part of conducting independent research. Like it or not, you will be forced to struggle with the issue of what constitutes an interesting question. We will spend several pre-field class sessions and one day in the field trying to gain an understanding of what kinds of questions can be addressed in the short time frame we have available for field work.

Research methods.--This is your chance to show everyone how innovative you are at designing a way to test an idea using only a pencil, some paper, and possibly some sticks and baling wire! Theoretically, the instructor has gained a good deal of field experience, and should be able to help refine (not develop from scratch) your research design. Since the emphasis here is on the process of science, we tend not to get too carried away with fancy research tools.

Analysis.--Because you have had statistics by now, you should be able to analyse your own results quantitatively. I will work with you in the field to find appropriate methods of analysis (an integral part of research design). Upon return to campus, you will be expected to enter, manage, and analyse their data independently.

Written report.--Your report should be written in publishable format using the journal Ecology as a model. A typed, double-spaced draft of your paper will be due by 10 April, and a final version will be due a couple of weeks later after feedback from the instructor and from peers.

Oral presentation.--Each student will be required to present a brief oral report. The format will be exactly like that expected at a professional meeting (8 minutes to speak, 2 minutes for questions), and will take place during a Monday afternoon class session that will be open to the general university community. This will also be the time and place for peer review (evaluation) of your work.

Grading procedure: Grades will be based on performance in each of the areas outlined above, and earned points will be broken down by question and design (10), field work (10), first draft of written report (10), outline for oral presentation (5), oral presentation (10--based on peer evaluation), and final draft of written report (5). Independence, originality, and personality at each stage of the course count for a lot because those elements are important components of a successful independent researcher (what graduate advisors tend to look for). Nonetheless, social interaction is important, and the better students should interact with and help others.

A student who can follow instructions every step of the way will have developed into no more than a fine **field technician**, which is quite different from developing into an independent **field biologist**. The degree to which the project is “yours” is inversely related to the amount of direction you took from the instructor, but positively correlated with to the amount of advice you obtained from the instructor and others. You should seek a nice balance between independence and consultation--stubborn independence is as bad as the need to have someone hold your hand the whole way through a project.

Reading: I ordered copies of the new text “A natural history of the Sonoran Desert,” but there are numerous additional books that can give you a good feeling for the desert environment if you want some good bedtime reading (see examples cited below):

Cowles, R. B. 1977. Desert journal: reflections of a naturalist. University of California Press, Berkeley, CA.

Fisk, E. J. 1983. The peacocks of Baboquivari. W. W. Horton and Co., New York, NY.

Hornaday, W. T. 1983. Camp-fires on desert and lava. University of Arizona Press, Tucson, AZ.

Jaeger, E. C. 1961. Desert wildlife. Stanford University Press, Stanford, CA.

Kirk, R. 1973. Desert: the American Southwest. Houghton Mifflin Co., Boston, MA.

Krutch, J. W. 1963. The desert year. The Viking Press, New York, NY.

Phillips, S. J., and P. W. Comus (editors). 2000. A natural history of the Sonoran Desert. Arizona-Sonora Desert Museum Press, Tucson, AZ.

Logistics:

(a) field location--Organ Pipe Cactus National Monument. The address and phone you can give to someone in case of emergency is: OPCNM, Route 1, Box 100, Ajo, AZ 85321 (602)387-6849. We will be staying in one of the group campsites;

(b) departure time--as soon as possible after classes end before spring break;
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(c) mode of travel--volunteer drivers;

(d) equipment--we will bring a lot of the basics, but you should bring any specialized equipment you might need;

(e) personal camping items--I'll provide a separate handout that lists some recommended items;

(f) food and money--we will probably do dinner cooking communally to be somewhat efficient and to provide social relief at least once a day. Menus will be planned later in the semester, so you can begin to concoct recipes now! You will be responsible for other meals

Tentative class schedule

- 24 January**—administration (names, e-mails, etc.); orientation to goals of the course; assign reading in book about plants and critters to help students hone in on a conceivable topic for short-term desert research
- 31 January**—develop a series of research categories; assign categories for further digging; discuss the essence of a good project and present example of successful short-term study
- 7 February**—hand in updated list of short-term studies; hand out dataset to analyse
- 14 February**—review analyses; dataset number two with graphical analysis
- 21 February**—Holiday
- 28 February**—review new analyses; discuss writing issues
- 6 March**—equipment needs; logistics of travel finalized
- 13 March**—final logistics
- 18-26 March**—in the field
- 27 March**—help sessions (sign up)
- 3 April**—help sessions (sign up)
- 10 April**—papers due; discuss oral presentations
- 17 April**—presentations
- 24 April**—final paper due