

Spring 2009
Honors Seminar
Evolutionary Ecology: The Ecology of Change

Instructor: Dr. Rich Shefferson

Tuesdays 9:30-10:45

Ecology Building, room 117

Office Hours: 11am-noon Tu or by appointment

Office Location: Biological Sciences 364

E-mail: dormancy@uga.edu

Course website: <http://www.sheffersonlab.com/spr91990.html>

Ecologists typically seek to understand how organisms interact with their environment, and with each other. But as species evolve, their behaviors and responses change. How can we understand the natural world when all organisms change over time, and in seemingly unpredictable ways? This seminar will explore the basic concepts and tools of evolutionary ecology - the study of how organisms evolve in response to their environments, and in turn how such evolutionary change can impact the environment. We will take a wide view of ecology and evolution, and explore issues from the evolution of the earth, to how biological interactions evolve, and to how global climate change can impact evolution and extinction.

This course will be topical and will involve weekly readings to be assigned in class. Grading will be based on 30% participation, 20% each for two 2-page papers, and 30% for one short presentation.

Important dates:

10 Feb – Paper 1 due

31 Mar – Paper 2 due

21 Apr - Presentations

SCHEDULE

<u>Date</u>	<u>Topic</u>
13 Jan	What is evolutionary ecology? And basic concepts in ecology
20 Jan	Principles and mechanisms of evolution
27 Jan	Genetics in evolutionary ecology
3 Feb	Life histories
10 Feb	Trade-offs; PAPER 1 DUE
17 Feb	Evolution ecology and conservation; Review
24 Feb	Evolutionary history and phylogenetics
3 Mar	Diversity, species, and speciation; APPROVAL OF TOPIC FOR PAPER 2 DUE
17 Mar	Biological interactions
24 Mar	Case study in Host-Parasite Interactions (Daniel Streicker, UGA Ecology); APPROVAL OF PRESENTATION TOPIC DUE
31 Mar	Symbioses; PAPER 2 DUE
7 Apr	Evolution in natural communities
14 Apr	Case study: Mycorrhizae and parasitic plants
21 Apr	PRESENTATIONS
28 Apr	Case study in Population Ecology (Dr. John Drake, UGA Ecology)

PARTICIPATION

Participation in class activities is vital to developing an appropriate understanding of the material, and so 30% of each student's grade will be determined by class participation. Participation includes regular attendance of all classes, reading assigned readings and discussing them in class, and actively participating in all class discussions. Students are also invited and encouraged, though not required, to discuss topics of interest with the professor during office hours.

READINGS

Readings will be assigned for each week's topic. Readings for each class will be posted on the class website by the day of the previous class. Please check the website regularly to stay up-to-date.

GUIDELINES FOR CLASS ASSIGNMENTS

Class papers - Papers are intended to provide students with an opportunity to show their understanding of topics relevant to evolutionary ecology. The topic of each paper should meet the following criteria:

Paper 1: Choose a problem in conservation biology and explain how evolutionary approaches can help resolve it.

Paper 2: Summarize AND CRITIQUE a scientific research paper dealing with a topic in evolutionary ecology. The paper chosen must be approved by the professor by 3 March (please send topic by e-mail to the professor at dormancy@uga.edu). Please note that the paper must be of the primary literature - no review papers nor books may be chosen.

Students are encouraged to discuss their topics with the professor beforehand. Papers should be double-spaced and written in 11pt Times New Roman font on 8.5" × 11" paper with a one-inch margin on all sides. Length of papers should not exceed 2 pages each.

Presentations - Presentations are intended to provide students with an opportunity to showcase their own ability to think scientifically about problems in evolutionary ecology. Students will work in pairs and choose an interesting problem in evolutionary ecology. They should then plan an experiment to test the problem. The presentation should be focused on this experiment. The presentation should be organized, with the following sections:

1. Introduction: What is the topic of interest? What is the chosen system? Why are these topics and systems interesting and worth studying?
2. Methods: How exactly would the experiment be conducted? What are the hypotheses to be tested?
3. Expected results: What are the possible scenarios that can happen in the experiment? How would these results be interpreted?
4. Discussion: How will the experiment affect evolutionary ecology and the topics presented in the Introduction? Will the problem have any impacts on our understanding of other fields and systems?

Please create your presentation as a Windows-compatible MS PowerPoint file. Topics should be approved by 24 March (send topics by e-mail to dormancy@uga.edu). Presentations should be 12-15 minutes long, and will be done 21 April.