PCB 4683: Evolutionary Biology
Fall 2013
T, TH 1130-1320 h in HPA1, Room 119

Dr. John E. Fauth
BL 401D
E-mail John.Fauth@ucf.edu
Phone 407-823-1661

Graduate teaching assistants

Ms. Gina Ferrie
BL 427
E-mail gferrie@knights.ucf.edu
Office hours: TH 1330-1630 h

Mr. Jason Hickson
BL 425
E-mail hickson@knights.ucf.edu
Office hours: M, T 0730-0830

Catalog description: PCB 4683 COS-BIOL 4(4,0)
Evolutionary Biology: PR: A grade of "C" (2.0) or better in PCB 3044 and PCB 3063 or C.I. Demographic and genetic structure of populations and their relationship to speciation, adaptation, and macroevolutionary processes in plants and animals. Fall, Spring.

Course overview: This course introduces major topics of population genetics and evolutionary biology. The approach emphasizes basic principles and theory rather than descriptive science. Principles of ecology and genetics will be considered as the foundation underlying all aspects of evolutionary biology. Concepts in adaptation, speciation, classification and macroevolution will be considered. The importance of evolutionary concepts to all facets of biology will be stressed, with special emphasis on the interplay between evolution and the traditional fields of ecology, genetics, and developmental biology.

Course objectives

- Understand the principles of population genetics, including selection, genetic drift, linkage, and gene flow
- Understand the mechanisms of adaptation, speciation, and diversification
- Understand the relevance of evolutionary biology to human society, particularly human health issues
- Develop quantitative reasoning skills
- Increase ability to understand hypotheses and critique predictions

http://www.statesymbolsusa.org/Pennsylvania/Fossil_Trilobite.html

Prerequisites: A grade of C (or better) in undergraduate genetics and ecology courses. A sound understanding of basic ecology and genetics is crucial to your success in this class.

Required text: Futuyma, D. J. 2013. Evolution, 3rd edition. Sinauer Associates, Sunderland, MA. ISBN 978-1-60535-115-5. Other recently published textbooks are viable substitutes for this book.

Office hours: By referral from the course graduate teaching assistants, M 1230-1430.

Schedule

Date	Topic	Readings
20 AUG	Course logistics Why evolution is important	
22 AUG	**EXAM I: Pre-test**	
27 AUG	The scientific method & the birth of statistics Theories of evolution	Hairston paper Chapter 1
29 AUG	Classification & cladistics	Pages 19-34
03 SEP	Statistical methods of phylogenetic analysis	Pages 34-49
05 SEP	Patterns of evolution Allometry	Chapter 3 S. J. Gould essay
10 SEP	Evolution in the fossil record & historical evolution	Chapters 4 & 5
12 SEP	Biogeography Phylogeography	Chapter 6 Medley paper
17 SEP	Evolution of biodiversity & the great extinctions	Chapter 7
19 SEP	**EXAM II**	
24 SEP	Origins of genetic variation	Chapter 8
26 SEP	Basics of ecological & population genetics	Pages 217-228 & 239-247
01 OCT	Inbreeding & linkage disequilibrium	Pages 229-239
03 OCT	Variation	Chapter 9
08 OCT	Genetic drift	Chapter 10
10 OCT	Natural selection & adaptation	Chapter 11
15 OCT	**EXAM III**	
17 OCT	Genetic theory of natural selection	Chapter 12
22 OCT	Phenotypic evolution	Chapter 13
24 OCT	Life history evolution	Chapter 14
29 OCT	Sex and reproductive success	Chapter 15
31 OCT	Conflict and cooperation	Chapter 16
5 NOV	Species & speciation	Chapters 17 & 18
7 NOV	**EXAM IV**	
12 NOV	Evolution of species interactions	Chapter 19
14 NOV	Evolution of genes & genomes	Chapter 20
19 NOV	Evolution of development	Chapter 21
21 NOV	Macroevolution	Chapter 22
26 NOV	Evolution & society	Chapter 23
05 DEC	**EXAM V – Final Exam, 1000-1200 h**	

Attendance: I will not monitor attendance but past results show that students who actively participate in my courses do much better than those who don't.

Course materials: We generally distribute additional readings, PowerPoint presentations, etc., via your campus e-mail. Checking and maintaining your campus electronic mail account is a requirement for students graduating under the 2011 (and previous) catalog. We will only provide materials once; you must obtain anything you missed from your classmates.

Assessment: Your final grade will be determined by your performance on the five exams, as follows:

Exam I (Pre-test)	5%
Exam II	15%
Exam III	20%
Exam IV	25%
Exam V (Final exam)	35%

All exams are closed book and cumulative. They will include diverse questions on all aspects of the course, including lecture material, readings, and activities. Exams will be challenging and will require you to apply evolutionary concepts to new situations, to evaluate data, and to design incisive hypothesis tests.

Make-up exams: All exams are cumulative, so if an acceptable absence forces you to miss an exam, its weight will be added to the final exam. Acceptable absences are limited to major illness, serious family emergencies, special curricular or professional requirements (e.g., attending a scientific meeting), court-imposed legal obligations, military obligations, severe weather conditions, religious holidays, and participation in official university-sponsored activities such as intercollegiate athletics. If you miss an exam for other than an acceptable absence your score will be a zero.

Grades: Dr. Fauth uses competency-based grading in all of his courses: to earn an A, one must demonstrate the abilities expected of an excellent undergraduate-level evolutionary biologist. If the entire class demonstrates such abilities, we will be absolutely delighted to give everyone an A! The easiest way for everyone to earn an A is to help each another - peer learning and altruism benefits everyone. A score of 60% is necessary for a D, 70% for a C, 80% for a B, and 90% for an A. Numerical grades <60% earn an F. Pluses and minuses will be assigned to the upper and lower 25% of each grade bracket, e.g., 87.5-89.4 = B+, 82.5-87.4 = B, 79.5-82.4 = B-. Dr. Fauth a longstanding reputation as a "harsh but fair" grader. Your final grade should reflect your ability as an undergraduate-level evolutionary biologist. However, we hope you will not obsess about grades as they may not reflect how hard you've worked, how much you've learned, or even how much you've matured as a biologist, and they certainly do not reflect your value as a person. In college there is much to be learned outside the classroom and you will need to balance your personal goals and aspirations versus grades per se.

Classroom behavior: We come to class on time, organized, prepared, and focused, and expect you to do the same. We do not tolerate disruptive behavior, and will deduct 5 pts. from a student's final numerical grade for each incident of arriving late to class, leaving class early, distruptions from a cellular phone, pager, or other electronic device, or other unruly behavior.

Cheating: Don't! We will not tolerate cheating, unauthorized assistance or plagiarism of any type and will pursue disciplinary actions to the fullest extent possible. Rules of student conduct (including definitions of cheating, unauthorized assistance and plagiarism) are published in Section E of *Golden Rule*.

Withdrawal: The deadline for withdrawal without penalty is published by UCF. You will need to decide whether or not to remain in the course by that time. We do not give grades of Incomplete and the Biology Department does not give grades of NC (no credit).

Disability statement: UCF & Dr. Fauth are committed to providing reasonable accommodations for all persons with disabilities. This syllabus is available in alternate formats on request. Students with disabilities who need accommodations in this course must meet with Dr. Fauth at the beginning of the semester to discuss ways to implement them.

The professor reserves the right to change the syllabus as necessary. Changes will be e-mailed and announced in class.