

EEB 511 Graduate Evolutionary Biology (CORE) - Fall 2014

The EEB graduate ecology and evolutionary biology class is intended to provide a rigorous introduction to current knowledge in key, “core”, areas of evolution and ecology. Successful completion of this course should bring you to a level of sophistication that allows you to read and critically evaluate the current literature, and to discuss both evolutionary topics with visiting speakers and (ultimately) search committees and potential employers. A spring complementary course will do the same for ecology.

Central learning objectives: This course is not intended to teach you everything you need to know about evolution. Instead, we hope to help you develop a foundation of knowledge and confidence upon which to build the specialized knowledge needed for your individual research program and the breadth of knowledge needed to participate in academic science. We also hope that the course and the topics discussed may lead to new collaborations.

Course Organizers: Ben Fitzpatrick (benfitz@utk.edu; 974-9734; 524 Hesler)
Brian O’Meara (bomeara@utk.edu, 974-2804, 446 Hesler)

Other instructors: Joe Williams, & Jim Fordyce

Meetings: 427 Hesler Biology
Mon & Wed 2:30 – 4:25

Course Number: Fall: EEB 511 – 4 credit hours

Office Hours: O’Meara, Mondays at 1:30 in Hesler 446.
Fitzpatrick, Fridays at 1:30 in Hesler 524.
Other faculty available by appointment.

Readings: Assigned readings available on BlackBoard (<http://online.utk.edu>)

Software: R (free online)

Format: This course covers a series of modules that represent major conceptual areas within EEB in evolution; a similar course will follow for ecology. The course will include a combination of lectures, discussions, in-class exercises and/or homework led by a variety of faculty members. Promoting interaction between diverse faculty and first-year students is an important function of the core. A strong emphasis will be placed on independent reading. Several papers for each module will be made available to students via the course BlackBoard site. These papers will include both classic papers and modern treatments or examples. Some of these papers will be discussed in class, but not necessarily all. Students are expected to have read and studied all papers prior to coming to class. We strongly suggest that you form a reading group to discuss the papers outside of class time.

Grading: There will be a midterm and a comprehensive final exam. There are two possible dates for the final exam, based on the exam schedule: Dec. 12 and Dec. 5. The date of the exam will be chosen early in the semester through consultation with students. Questions from each module

will be included on these exams. Each module might also include writing assignments, problem sets, and/or in-class exercises (which may be announced ahead of time or not). Your grade will also be based on your preparation for, and participation in, class discussions. You may be quizzed on earlier material later in the course. A final grade of B or higher is required in this course for students to be classified as making adequate progress in the graduate program. [Note: consult the graduate student handbook on annual progress reports].

Grades in graduate study have the following meanings.

- A (4 quality points per semester hour) superior performance.
- B+ (3.5 quality points per semester hour) better than satisfactory performance.
- B (3 quality points per semester hour) satisfactory performance.
- C+ (2.5 quality points per semester hour) less than satisfactory performance.
- C (2 quality points per semester hour) performance well below the standard expected of graduate students.
- D (1 quality point per semester hour) clearly unsatisfactory performance and cannot be used to satisfy degree requirements.
- F (no quality points) extremely unsatisfactory performance and cannot be used to satisfy degree requirements.

Any student who feels s/he may need an accommodation based on the impact of a disability should contact the instructors privately to discuss your specific needs. Please contact the Office of Disability Services at 865-974-6087 in Hoskins Library to coordinate reasonable accommodations for students with documented disabilities.

This syllabus is subject to change at the discretion of the instructors. Students will be informed of relevant changes during the course.

This section of the course will feature exercises in R. We recommend bringing a laptop with R installed to the first class. If you do not have a laptop, please let the instructors know; there may be teaching laptops available.

Schedule of Topics and Instructors:

Week	Day	Date	Topic	Instructor
0	W	20-Aug-14	Introduction and pre-test	O'Meara & Fitzpatrick
1	M	25-Aug-14	R for EEB	Fordyce
	W	27-Aug-14		
2	M	1-Sep-14	Labor Day	
	W	3-Sep-14		
3	M	8-Sep-14	History and overview	
	W	10-Sep-14	of evolutionary biology	Fitzpatrick
4	M	15-Sep-14	Population genetics and	
	W	17-Sep-14	evolutionary theory	Fitzpatrick
5	M	22-Sep-14		
	W	24-Sep-14		
6	M	29-Sep-14		
	W	1-Oct-14		
7	M	6-Oct-14		
	W	8-Oct-14		
8	M	13-Oct-14	Why phylogenetics, reading trees	
	W	15-Oct-14	Likelihood, Bayes, model selection, bootstrap	O'Meara
9	M	20-Oct-14	Ingredients for phylogenetic methods	
	W	22-Oct-14	DNA models, heterogeneity, alignment	
10	M	27-Oct-14	Continuous traits and tree stretching	
	W	29-Oct-14	Gene tree incongruence	
11	M	3-Nov-14	Species, speciation, taxonomy	
	W	5-Nov-14	Diversification	
12	M	10-Nov-14	Phenotypes and function	Williams & Fitzpatrick
	W	12-Nov-14		
13	M	17-Nov-14		
	W	19-Nov-14		
14	M	24-Nov-14		
	W	26-Nov-14	no class	
15	M	1-Dec-14	Synthetic discussion	O'Meara & Fitzpatrick
	W	3-Dec-14	classes over	