

## **EEB 120 – Evolution** **Summer 2009**

“Nothing in biology makes sense except in the light of evolution.”  
--T. Dobzhansky, 1973

### **Course Objectives:**

Evolutionary theory is central to every aspect of modern biology. Evolutionary theory is developed, supported, and tested by results of observations and experiments from diverse areas of biology. Indeed, the study of evolution unifies ideas from all domains of biology. This course is design to help you understand evolution, including the major ideas, evidence, arguments, and misconceptions involved.

### **Instructor:** Graham Slater

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Office Hours: T, Th 12:00-1:00 pm or by Appt., held in LS 5223

**Lecture:** T, Th 9:30-11:50 pm; Botany 325

**TAs:** Name: **Asif Razee**

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Office Hours: TBA

**Discussion:** 1A: T 1:00-2:20 pm; LS 1113

1B: Th 1:00-2:20 pm; LS 1113

**Textbooks:** Evolution. 2005. Douglas J. Futuyma.

The preceding text is required for this course. Readings for each week are listed in the course calendar. I highly recommend you read the chapters in your textbook. Familiarity with general topics will make things run much more smoothly.

**Website:** <http://www.lsic.ucla.edu/>

### **Course Construction:**

This class consists of two 2 hour lectures and one discussion section per week. There is a lot of material to cover in lecture and the summer session passes quickly. Prior to each lecture I will post my slides on the course website, but these are only an outline of what will be covered. You must pay attention and take your own notes to do well in this course. You are welcome (and encouraged) to tape any of my lectures. When studying, focus on what I

covered in class. My lecture is telling you what material is the most important to learn.

**Grading:** The following is the point distribution for the class:

Lecture:	Midterm 1	100pts	
	Final Exam	150pts	(50 pts cumulative)
Discussion:	Quizzes	50pts	
	Presentation	50pts	
	Participation	50pts	
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	TOTAL	400pts	

**Lecture Exams:** Multiple choice, matching, fill-in-the-blank, and short to medium answers (describe, explain, outline, draw) covering material from the previous lectures. In addition, the FINAL WRITTEN EXAM will be about 20% cumulative (i.e., with material from before the midterm). Exams are held during class time on 8/19 and 9/10. **NO MAKE-UP EXAMS ARE ALLOWED, SO SCHEDULE ACCORDINGLY!**

**Discussion:** Attendance and participation is mandatory and graded. You will read, present and discuss selected primary literature articles each week. Each week you will have a quiz (10pts), which will include short answer questions (a few words or a short sentence) drawn from the discussion articles for that week. No makeup quizzes. Presentations (50pts) will be done in groups of 2 or 3.

**Grading Scale:** Final grades will be likely be assigned based on the distribution of points after the final exam. As a guide to your performance throughout the class, you should assume a straight scale.

90-100% = A  
80-89% = B  
70-79% = C  
60-69% = D  
< 60% = F

**Cheating and Plagiarism:** Cheating and plagiarism will not be tolerated in any form.

## Lecture Schedule:

**disclaimer:** The following schedule is a guide to the topics we will cover in lecture. We may go into more detail in some topics, less in others. For this reason, the dates for each topic listed here are provisional. You should read the appropriate chapters of the book as we get to each topic

Week	Date	Topic	Reading* (ch.)
1	August 4, Tuesday	Introduction, What is Evolution? History of Evolutionary Thought	1, 22
1	August , 6 Thursday	Classification and systematics	2
2	August 11, Tuesday	Fossils and Biogeography	4-7
2	August 13, Thursday	Genetic basis for variation and heredity	89
3	August 18, Tuesday	Natural Selection and other forces	10-12
<b>3</b>	<b>August 19, Thursday</b>	<b>Midterm</b>	
4	August 25, Tuesday	Evolution of phenotypes and patterns of evolution	3, 13
4	August 27, Thursday	Species and Speciation	15, 16
5	September 1, Tuesday	Coevolution and EvoDevo	18, 20
5	September 3, Thursday	Macroevolution - evolution above the species level	21
6	September 8, Tuesday	Humans and Evolution	
<b>6</b>	<b>September 10, Thursday</b>	<b>FINAL EXAM</b>	

\* Readings refer to chapters in Futuyma (2005). "ref" indicates chapters to be used for reference as needed.

## Discussion

In discussion, you will read, present, and discuss primary evolution literature. The aim of discussion is to expose you to some of the current work going on in the field of evolutionary biology. Papers will be posted to the class website, and presenters will be allocated during discussion in the first week.

Week	Topic	Reading
1	Introduction	No Reading
2	Molecular and morphological evolution	Demere et al. 2008. Morphological and Molecular evidence for a stepwise evolutionary transition from teeth to baleen in mysticete whales. <i>Systematic Biology</i> 57: 15-37.  Padian & Chiappe. 1998. The origin of birds and their flight. <i>Scientific American</i> . February 1998: 38-47.
3	Natural Selection and Adaptation	Gould & Lewontin. 1979. The spandrels of San Marco and the Panglossian paradigm: a critique of the adaptationist program. <i>Proceedings of the Royal Society of London B</i> 205: 581-598.  Kirschel, Blumstein and Smith (2009). Character Displacement of song and morphology in African tinkerbirds. <i>Proceedings of the National Academy of Sciences</i> 106: 8256-82561.
4	Speciation	Colosimo et al. 2005. Widespread Parallel Evolution in sticklebacks by repeated fixation of ectodysplasin alleles. <i>Science</i> . 307:1928-1933.  Seehausen et al. 1997. Cichlid fish diversity threatened by eutrophication that curbs sexual selection. <i>Science</i> 277: 1808-1811.
5	Macroevolution	Gould & Eldridge. 1993. Punctuated equilibrium comes of age. <i>Nature</i> 266: 223-227.  Van Valkenburgh, Wang, & Damuth. 2004. Cope's rule, hypercarnivory, and extinction in North American canids. <i>Science</i> 306: 101-104.
6	Human Evolution	Jabloski and Chaplin (2000) The evolution of human skin color. <i>Journal of human evolution</i> . 39: 57-106  Tishkoff and Williams (2002) Genetic Analysis of African Populations: human Evolution and complex disease. <i>Nature Reviews</i> 3: 611- 621