

# BIO 4480: Evolution

Fall 2012

Lecture: M,W,F 9AM-10:50AM

“Nothing in biology makes sense except in the light of evolution.”  
-Theodosius Dobzhansky

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**Office hours:** 10-11 MWF, 2:30-3:30 TR and by appointment

## **Texts:**

Stearns and Hoekstra. 2005. Evolution: an introduction 2<sup>nd</sup> edition. Oxford University Press, Oxford.

Williams and Nesse. 1994. Why We Get Sick: The New Science of Darwinian Medicine. Random House.

## **Course overview:**

Evolution is the unifying theory of biology with applications to every field of biology. While scientists almost universally agree on the theory it is hotly disputed in US society at large. We will discuss the evidence and scientific basis for evolution, mechanisms of evolution including genetic variation and natural selection, population genetics, and speciation. In addition, according to student interest we may also discuss applied topics such as Darwinian medicine, sexual selection, evolution of cooperation, and human evolution. We will also address the societal debates involving the teaching of evolution and/or intelligent design in schools. The format of the course will include participatory lectures, student-led discussions and activities.

## **Course Learning Outcomes:**

To understand:

1. all Darwinian and non-Darwinian theories of evolution
2. the evidence all disciplines of biology provide for evolution
3. how evolutionary theory is applied to medicine, agriculture, and conservation
4. mechanisms that shape micro and macro evolution

## **Attendance:**

Lecture: I do not take attendance in lecture; however, you will be responsible for all information covered in lecture sessions. **Most of the examples and some of the concepts covered in class may not appear in your textbook. You are responsible for any and all announcements made in class.**

Withdrawal Policy – The last day to withdraw from this class with a **W** is October 4, 2012. Thereafter, I **will not** issue any withdrawals from the course, and you will receive an official grade.

Participation in College-related Activities:

If you have to miss an exam, you must submit a signed note from a Doctor, Department Head, Coach or Supervisor. Please see me immediately to schedule a time to make up an exam. If you do not make up an exam within a week after it was originally scheduled, you will receive **a grade of zero** for the exam. If you have an unexcused absence from an exam, you will receive **a grade of zero** for the exam.

**Evaluation:**

I do not “give” you a grade, you *EARN* a grade. There will be no extra credit. Your grade reflects the number of points you have accumulated in this course and you are wholly responsible for it. You will accumulate grades through the following assignments:

Exams: There will be three exams (including the final) worth 100 points each covering the material in your readings, homework, and discussed in class. Exams will include multiple choice questions, short answer and/or essay. The final exam will also be worth 100 points, but will be comprehensive.

Class Participation & Quizzes: Class participation includes in-class activities, quizzes and discussion of articles for a total of 100 points. All quizzes will be announced ahead of time. These activities cannot be made-up if you miss a class.

Homework: I will give you homework assignments over the semester that will help you integrate and work through some of the important evolutionary ideas that we will cover. Specific instructions will be given for each assignment.

Tell Me a Story: The last two weeks of the semester will be used for student presentations about a particular “story” in evolutionary biology. This assignment is worth 60 points. More details will be given soon.

	#	Points	Total	Percent of Grade
Exams	2	100	200	33%
Final Exam	1	150	150	25%
Participation & Quizzes	TBD	100	100	16%
Homework	4	25	100	16%
Tell me a story assignment	1	60	60	10%

There is no curve in this class; your grade is simply determined by the sum of your points: **90-100% = A(+/-); 80-89% = B(+/-); 70-79% = C(+/-), 60-69% = D(+/-); <59% = F**

## Tentative Schedule

This schedule is set through the first exam but is tentative for the remainder of the semester.

Week	Dates		Book	Readings
1	8/15 8/17	Introduction and development of topics HIV as evolutionary science	Ch. 1 Ch. 2	HIV paper
2	8/20 8/22 8/24	Natural selection Types of selection Limits to adaptations, start neutral evolution	Ch. 2 Ch. 2-3	Spaniels paper
3	8/27 8/29 8/31	Neutral evolution Population genetics: H-W	Ch. 3 Ch. 4	PopG lab
4	9/3 9/5 9/7	LABOR DAY - NO CLASS Genetic Impact of Selection Origin and maintenance of variation	Ch. 4 Ch. 5	Lizard paper
5	9/10 9/12 9/14	...continued <b>Exam I</b>	Ch. 5	
6	9/17 9/19 9/21	What is sex? PBS Video- Why sex?	Ch. 8 Ch. 8	West et al 1999
7	9/24 9/26 9/28	Anisogamy Sexual Selection	Ch. 11 Ch. 11	Lonely Hearts
8	10/1 10/3 10/5	Species concepts Systematics and Phylogenies	Ch. 12 Ch. 13	
9	10/8 10/10 10/12	Methods in phylogenetics Coevolution And Kin Selection	Ch. 14 Ch. 18	
10	10/15 10/17 10/19	Connecting micro and macro evolution <b>Exam II</b>	Ch. 18	
11	10/22 10/24 10/26	Extinctions and explosions Origins of Life Discussion	Ch. 15 Ch. 16	Freeman and Herron Ch 17
12	10/29 10/31 11/2	Early hominids Evolutionary medicine	Ch. 19	
13	11/5 11/7 11/9	TBD Invited Speaker:		
14	11/12 11/14	TBD		

	11/16			
15	11/19 11/21 11/23	<b>Student Presentations</b> Thanksgiving Holiday – No Class Thanksgiving Holiday – No Class		
16	11/26 11/28 11/30	<b>Student Presentations</b>		
	12/3	<b>Last Day of Classes</b>		
		<b>Date and Time of Final Will Be Announced in Class</b>		

Potential additional topics:

- *Creationism—Intelligent Design—Evolution*
- *Darwinian Medicine*
- *Evolution and development*