

BSC 483 Evolution (3 credits)
Spring 2011
10-10:50 AM, 202 Biology Building

Instructor:	Dr. Daniel L. Graf,	Email:	dlgraf@bama.ua.edu
Office:	409 MH Bryant Hall		(include "BSC 483" in subject)
Phone:	348.2537	Office Hours:	Tuesday 2-4 PM
Web site:	eLearning site on mybama.ua.edu		Thursday 8-10 AM or by appointment

General Course Description. "Thorough investigation of evolution, including population genetics, molecular evolution, adaptation, and speciation." This is a course covering both the patterns and processes of biological evolution. Either this course (BSC 483) or Fundamentals of Biochemistry (BSC 450) must be taken to satisfy the degree requirements for the BS in Biology.

Objectives. The objective of this course is to synthesize the diverse data and current theories on the patterns and processes of biological evolution.

Course Objectives

Your instructor will:

1. Review and synthesize the biological patterns that evolutionary theory seeks to explain.
2. Discuss current and historical explanations of the processes behind those patterns.
3. Introduce current methods used to study biological evolution.
4. Emphasize the relevance of evolution to society.

Learning Outcomes

You will be able to:

1. Differentiate scientific from non-scientific explanations of natural processes and be able to critically evaluate scientific information.
2. Describe the evidence for evolution, including that derived from population genetics, molecular/developmental biology, paleontology, biogeography, ecology, and comparative biology.
3. Explain the genetic mechanisms of microevolution, including the roles of mutation, gene flow, selection and genetic drift.
4. Discriminate adaptive evolution (natural selection) from kin selection and sexual selection.
5. Understand the processes behind macroevolution, including speciation, extinction, and the evolution of complex traits.
6. Demonstrate critical and independent thought.

Prerequisites. Courses in Introductory Biology (BSC 114-115/118, 116-117/120) and Genetics (BSC 315).

Required Materials. *Evolutionary Analysis*, 4th edition (2007), by Freeman and Herron. Pearson Benjamin Cummings, San Francisco (ISBN 0-13-227584-8).
The 3rd edition will be sufficient if you don't have access to the 4th.

Grading. Your final grade in BSC 483 will depend upon your performance in four categories of evaluation: exams, daily quizzes, biweekly quizzes, and group discussion/reading assignments.

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Daily Quizzes	50	10%
Biweekly Quizzes	75	15%
Discussion/Readings	110	23%
Midterm Exam	100	21%
<u>Final Exam</u>	<u>150</u>	<u>31%</u>
TOTAL	485	

There will be two exams that constitute 52% of your final grade: a 100-point Midterm (21%) and a 150-point, comprehensive Final (31%). The exams will be designed to test your ability to both synthesize your knowledge of evolutionary biology and apply critical-thinking to address novel questions. The bulk of any exam or quiz will be short-answer/essay questions.

A large part of your final grade (110 points, 23%) will be passed upon your preparedness and participation during discussion periods (most Fridays, described below).

Daily 3-point quizzes will take place at the beginning of each lecture period. These will generally be single questions covering material from the previous or current lecture. Any points accumulated above the scheduled 50 points (10%) will be considered "bonus points."

Roughly every other discussion period, there will be a 15-point quiz to evaluate your comprehension of material recently covered in lecture, readings, and discussions. There are six scheduled quizzes, and you will be able to drop the lowest quiz score (75 points; 15% of your final grade). If you miss a quiz, you will get a 0 and that score will be dropped. If you miss more than one quiz, those extra zeroes will be applied to your final grade.

Grades will be based upon the following percentages of the course totals:

100-99	A+	98-94	A	93-89	A-
88-87	B+	86-83	B	82-79	B-
78-77	C+	76-73	C	72-69	C-
68-67	D+	66-63	D	62-59	D-
<58	F				

NOTE: This course is cross-listed as both a 400- and 500-level class. The graduate students in the class (BSC 583) will be graded on their term papers rather than daily quizzes.

REQUESTS FOR EXTRA POINTS WILL NOT BE HONORED.

Exam and Quiz Rules. The following rules apply to exam periods as well as quizzes.

- If you arrive so late for an exam that anyone else has finished and left, you will not be allowed to take the exam at that time. You may be able to take a make-up exam (see below).
- If you arrive late for a scheduled quiz, you will not be given extra time. When the class is done, you will need to turn in your quiz. There are no make-up quizzes.
- All exams, quizzes, in-class group assignments, etc. MUST be completed in black or blue ink or pencil. **DO NOT COUNT ON YOUR INSTRUCTOR TO PROVIDE YOU WITH AN APPROPRIATE WRITING INSTRUMENT.**
- Baseball caps must be worn with the bill/brim to the back.
- MP3 players, cell phones, etc. will not be allowed in the testing area.
- There may be multiple exam forms: same questions, different order.

Discussion Periods. Most Fridays, we will suspend lecture to engage in discussion of various articles. These are not the textbook readings, but separate papers that will be posted on the eLearning site. They will be scientific papers or book chapters chosen to allow us to delve deeper into particular topics.

Discussion articles will be available on the course eLearning site. It is your responsibility to make sure that you have a copy of each Discussion article, and these should be read before you come to the discussion period. You will be graded on your preparedness as well as your participation.

Attendance. YOUR COMMITMENT TO YOUR CLASSES IS AMONG THE MOST IMPORTANT THINGS IN YOUR LIFE RIGHT NOW. You are expected to attend scheduled class periods. The exams WILL include material that is not covered in the textbook, and the in-class, daily quizzes will constitute 10% of your final grade. There will be NO opportunity to make-up missed daily quizzes, biweekly quizzes, or discussion assignments.

Make-Up Exams. You must make every effort to take exams at the scheduled times. Make-up exams will be allowed only in case of emergency, for which you must provide written documentation. YOU must make arrangements with Dr. Graf within 24 hours of the exam to schedule a make-up exam within one week of the scheduled exam or you simply forfeit the points.

- An emergency is a situation where your presence is required to alleviate extreme suffering (including but not limited to your own).
- The Student Health Center doesn't handle emergencies.
- Scheduled appointments aren't emergencies.
- A good rule of thumb: If your situation wouldn't cause you to postpone your wedding, it isn't a good reason to miss a scheduled exam.
- University athletes with appropriate paperwork (e.g., competition schedule, letter from the athletic department) may have excused absences. These should be discussed with your instructor within the first two weeks of class.

Academic Misconduct. “All students in attendance at the University of Alabama are expected to be honorable and to observe standards of conduct appropriate to a community of scholars. The University expects from its students a higher standard of conduct than the minimum required to avoid discipline. Academic misconduct includes all acts of dishonesty in any academically related matter and any knowing or intentional help or attempt to help, or conspiracy to help, another student. The Academic Misconduct Disciplinary Policy will be followed in the event of academic misconduct.”

Please refer to the Student Affairs Handbook, which you can get at The Office of Student Life and Services in the Ferguson Center.

If your instructor suspects academic misconduct, the matter is automatically sent to the Dean’s office.

NOTE: Dr. Graf is not a dumb as you might think he is.

Classroom Conduct. The Code of Student Conduct dictates that student behavior should promote an environment favorable to both teaching and learning. Students that choose to disrupt or obstruct our lectures and discussions will be sanctioned as described in the Code of Student Conduct (<http://catalogs.ua.edu/catalog08/504200.html>). It is considered disruptive to come late/leave early, to read extra-curricular materials in class, or to use cell phones (or other electronic devices) during class. Students who choose to disrespect their classmates and their instructor will be asked to leave.

If you want to keep your cell phone, you should not use it in class.

Disabilities. I encourage students with disabilities to register with the Office of Disability Services (348.3285), if you haven’t done so already. It is YOUR responsibility to contact me as soon as possible (dlgraf@bama.ua.edu) so that we can schedule a meeting outside of class time so that your needs can be accommodated.

Lecture Schedule

12 Jan.	W	0	Introduction: Syllabus & Scientific Method	Chapter 1
14 Jan	F	1	Evolutionary Biology: Pattern	Chapter 2
17 Jan.	M	–	MLK HOLIDAY: No Classes	
19 Jan.	W	2	Evolutionary Biology: Process	Chapter 3
21 Jan.	F	D1	<i>Discussion</i>	
24 Jan.	M	3	The Tree of Life	Chapter 4
26 Jan.	W	4	Patterns of Evolution	ditto.
28 Jan.	F	D2	<i>Discussion & Quiz 1</i>	TBA
31 Jan.	M	5	Fossil Record & the History of Life	Chapter 18
2 Feb.	W	6	Origin of Life	Chapter 17
4 Feb.	F	D3	<i>Discussion</i>	
7 Feb.	M	7	Mutation & Variation	Chapter 5
9 Feb.	W	8	Hardy-Weinberg & Genetic Drift	Chapters 6 & 7
11 Feb.	F	D4	<i>Discussion & Quiz 2</i>	TBA
14 Feb.	M	9	Migration & Inbreeding	Chapters 6 & 7
16 Feb.	W	10	Natural Selection & Mutation	Ditto.
18 Feb.	F	D5	<i>Discussion</i>	TBA
21 Feb.	M	11	Selection vs. Neutrality	Chapters 6 & 7
23 Feb.	W	12	Linkage & Sex	Chapter 8
25 Feb.	F	D6	<i>Discussion & Quiz 3</i>	
28 Feb.	M	13	Quantitative Genetics, Part I	Chapter 9
2 Mar.	W	14	Quantitative Genetics, Part II	ditto.
4 Mar.	F	M	Midterm Exam	
7 Mar.	M	15	The Study of Adaptation	Chapter 10
9 Mar.	W	16	Kin Selection	Chapter 12
11 Mar.	F	D7	<i>Discussion</i>	TBA
14 Mar.	M	–	SPRING BREAK: No Classes	
16 Mar.	W	–	SPRING BREAK: No Classes	
18 Mar.	F	–	SPRING BREAK: No Classes	
21 Mar.	M	17	Sexual Selection	Chapter 11
23 Mar.	W	18	Life History Evolution I: Life Span	Chapter 13
25 Mar.	F	19	Life History Evolution II: Reproduction	ditto.

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28 Mar.	M	20	Species	Chapter 16
30 Mar.	W	21	Speciation, Part I	ditto.
1 Apr.	F	D8	<i>Discussion & Quiz 4</i>	TBA
4 Apr.	M	22	Speciation, Part II	Chapter 16
6 Apr.	W	23	Biogeography & Complex Characters	Chs. 3, 4, 16
8 Apr.	F	–	HONORS DAY: No Classes	
11 Apr.	M	28	“Expelled” the Movie, Part I	—
13 Apr.	W	29	“Expelled” the Movie, Part II	—
15 Apr.	F	D9	<i>Discussion & Quiz 5</i>	TBA
18 Apr.	M	24	Topics in Human Health	Chapter 14
20 Apr.	W	25	Evolution of Genomes	Chapter 15
22 Apr.	F	D10	<i>Discussion</i>	TBA
25 Apr.	M	26	Evolution of Development	Chapter 19
27 Apr.	W	27	Human Evolution	Chapter 20
29 Apr.	F	D11	<i>Discussion & Quiz 6</i>	
3 May	T	F	Final Exam 11:30 AM-2:00 PM	