

BSC 305: Evolution Spring 2008

Instructor

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Office Hours

TBA (should be posted by 28 Jan. 2008)
Also by appointment one day in advance.

Course Description

Lecture. 3 hrs. A comprehensive treatment of evolutionary theory. Prerequisites: BSC 110 and BSC 111 or equivalent. BSC 370 and GLY 103 helpful.

Course Overview

This course serves as a comprehensive introduction to the concepts of evolution in biology. In particular, the course will demonstrate how evolution is central to an understanding of biology in accounting for the diversity of organisms, their characteristics, and their geographical distributions. The history of life on Earth will be studied using fossils and inferences from extant organisms, and the mechanism of natural selection and other evolutionary processes (*e.g.*, genetic drift) will be considered for their role in changing genes and populations through time. Other topics will also be discussed, including species concepts, methods of inferring phylogenies, macroevolution, and applications of evolutionary theory to other fields of study.

Course Objectives

Students will develop and demonstrate:

- An ability to differentiate science and metaphysics and how evolution has played a role at their boundary,
- A knowledge of the basic evidence of evolution and the scientific methods used to test them,
- A knowledge of evolution as history, process, and mechanism,
- An understanding of how evolution has explanatory power for a host of biological questions, and
- An ability to apply the principles and methods of evolution to other disciplines both within and outside biology.

Required Text and Supplies

- (a) Futuyma, D. J. 2005. *Evolution*. Sunderland, MA: Sinauer Associates, Inc.
(b) Darwin, C. 1859. *On the Origin of Species by Means of Natural Selection* London: John Murray (other editions are acceptable).

Class Procedures and Requirements

Attendance of the lecture is expected. The indicated chapter(s) in the book(s) should be read *before* class, which will prepare you for the material presented in lecture. A quiz will be given at the beginning of each class period. A missed quiz earns a grade of zero. At the end of the semester, four quiz grades will be dropped. Missed quizzes count toward your four drop grades. The exams will principally include material covered in lecture, but some questions may come from the relevant reading assignments. Lecture will include some material not present in the textbook. *Extra-credit will not be offered.* Make-up exams are **only** given if written corroboration of a disabling condition or situation is provided (doctor's note, parental note [with phone number] about funeral, police report). Contact professor immediately about re-scheduling. *Re-scheduling after one week is not possible, and a score of zero will be recorded.* One homework assignment must be turned in; you will infer the phylogeny for a group of organisms. After completing Darwin's book, you will write a one-page essay / critique. Details will be provided in class. The grade for the homework and essay will be deducted 10% for *each 24-hour period* that the assignment is late.

Evaluation Criteria

Quizzes	30%
Homework	5%
Essay	5%
Exam 1	20%
Exam 2	20%
Final Exam	20%

Grading Scale

90--100%	A
80--89%	B
70--79%	C
60--69%	D
0--59%	F

Professionalism

Disrespect of the professor and/or students will not be tolerated. Be prompt to class, and if you must leave early, please sit near the rear of the classroom. Questions are encouraged; please raise your hand to be recognized. The use of cellular phones, pagers, and other such electronic devices is prohibited. Computers may be used for note-taking, but disruptive behavior (surfing the web, typing loudly, etc.) will not be tolerated. Disruptive devices will be confiscated and impounded.

Academic Honesty (directly from the *Undergraduate Bulletin*, 2008)

"When cheating is discovered, the faculty member may give the student an F on the work involved or in the course. If further disciplinary action is deemed appropriate, the student should be reported to the Dean of Students. In addition to being a violation of academic honesty, cheating violates the Code of Student Conduct and may be grounds for probation, suspension, or expulsion. Students on disciplinary suspension may not enroll in any courses offered by the University of Southern Mississippi."

ADA Policy

If a student has a disability that qualifies under the Americans with Disabilities Act and requires accommodations, he/she should contact the Office for Disability Accommodations (ODA) for information on appropriate policies and procedures. Disabilities covered by the ADA may include learning, psychiatric, physical disabilities, or chronic health disorders. Students can contact ODA if they are not certain whether a medical condition/disability qualifies. Mailing address: 118 College Drive #8586, Hattiesburg, MS 39406-0001; Telephone: 601-266-5024; TTY: 601-266-6837; Fax: 601-266-6035.

Class Schedule*

Date	Topic	Reading Assignment (chapter from Futuyma or Darwin)
January 15	Logistics and Introduction to Evolution	
17	Evidence for Evolution	Fxii-xv, F1
18	Last day to register for class	
22	Metaphysics and Science Why Study of Evolution Is Important	F22
24	Inferring Phylogeny I: Homology	F2
29	Inferring Phylogeny II: Methods	
31	Complications in Phylogenetic Analysis	homework due
February 5	Mardi Gras Holiday no lecture	
7	Patterns of Evolution	F3, D Introductory Mat.
12	Fossil Record	F4, D1
14	Evolutionary History I	F5, D2
19	Evolutionary History II	D3
21	Exam 1 Dr. Alford out of town	
26	Evolution and Biogeography	F6, D4
27	Last day to drop course without academic penalty	
28	Evolution of Biodiversity	F7, D5
March 4	Variation I	F8, D6
6	Variation II	F9, D7
8–16	Spring Break no lectures	
18	Genetic Drift	F10, D8
20	Natural Selection and Adaptation	F11, D9
25	Natural Selection in Light of Genetics	F12, D10
27	Evolution of Phenotypic Traits	F13, D11
April 1	Exam 2	

3	Conflict and Cooperation	F14, D12
8	Species I	F15, D13
10	Species II	handout, D14
15	Speciation	16
17	Reproductive Success	17, essay due
22	Coevolution	18
24	Evolution of Genes and Genomes	19
29	Evolution and Development	20
May 1	Macroevolution Applications of Evolutionary Theory	21
Thursday, May 8 8:00–10:30 A.M.	Final Exam Comprehensive	video†

*Schedule may be revised if necessary. Students will be notified if this is the case.

† Video, NOVA's "Dogs and More Dogs," should be viewed sometime between March 27 and the day of the final. The final will include a question based on the video.