



EVOLUTION

BIOL 350.01 CRN 10219
Fall Semester 2016

Harbor Walk West (HWWE) 211, Tues/Thurs 12:45 – 2:00 PM

Instructor: Dr. Antony S. Harold, Grice Marine Laboratory (GML), Department of Biology, College of Charleston, 205 Fort Johnson, Charleston, SC 29412.
Office hours: Harbor Walk West room 311 (Tues/Thurs. 2:00 – 2:30) or GML 125 by appointment.

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Course Description

A study of the mechanisms and patterns of organismal evolution with emphasis on the species level of organization.
Prerequisites: BIOL 211, 305

Student Learning Outcomes

Students are expected to show mastery in the broad area of evolutionary biology, with emphasis on historical development of this field, interpretation of patterns of intraspecific variation, earth history as it pertains to processes of evolutionary significance, phylogenetic history, and evolutionary biogeography. The degree to which students have learned this material will be evaluated by (a) three written tests and a final examination, and (b) their ability to critically evaluate published works in evolutionary biology and write about their findings in a Critique Project report that will be graded.

Course Objectives

The primary objectives are to learn the essential concepts in evolutionary biology and apply them to the interpretation of hypothetical and empirical data sets. The course will finish by applying this knowledge to an understanding of current issues in evolutionary biogeography. The following list is a summary of broad subtopics representing the foundation of the course.

- a. Historical development of evolutionary thought
- b. Evolution by natural selection
- c. Other processes contributing to evolutionary change, such as the Founder Effect, random genetic drift, and gene flow
- d. Structure and history of the earth
- e. Historical patterns of organisms
- f. Variation among organisms
- g. Evolutionary rates
- h. Species concepts
- i. Speciation models
- j. Phylogenetic methods and analysis
- k. Geographical patterns of distribution and evolutionary interpretations

Policies and Requirements

1. This course will be conducted in accord with the Honor Code: see Student Handbook and other information on the Dean of Students web page.

2. Attendance Policy: You are expected to attend all meetings of the class. More than five unexcused absences will result in a grade of WA for the course.

Students reporting an absence should go to the Absence Memo Office located at 67 George Street (between Stern Center and Glebe Street) where the student may fill out a form with a schedule of missed classes, dates missed, etc. A representative from the Absence Memo Office will notify the appropriate faculty by E-mail.

3. Electronic Devices: The use of cell phones, laptops and other electronic devices during class is a distraction to both instructors and other students; to be fair to all those concerned they must not be in use while class is in session. Consequently, all electronic communications devices (e.g., cell phones, laptop computers) must be **silenced or turned off** during class. The use of a cell phone for any purpose during a test will be treated as a violation of the Honor Code.

Disabilities accommodations

If there is a student in the class who has a documented disability and has been approved to receive accommodations through the Center for Disability Services / SNAP, please come and discuss this with me during office hours.

4. Textbook (**required**): Ridley, Mark. 2004, 3rd edition. Evolution. Blackwell Science, Cambridge, MA, 751 p. ISBN 1-4051-0345-0 (paper)

5. Critique project

Each student will write a critique (review) of an article (exact title and citation to be announced) published in a research journal in the field of evolution. All students will read and evaluate the same article, and write a short paper. The project will be done in the second half of the course, after students have gained appropriate background knowledge. More details and instructions will be distributed in class. You must do this project independently, without collaboration.

6. Relative values of tests and critique project

Test 1	15%
Test 2 (mid-term)	20%
Test 3	15%
Critique Project	20%
Final examination	25%
Participation	05%

Note: The participation portion of the grade is based on your contributions in class (e.g., discussions), attendance, and adherence to course policies as set out in the syllabus.

7. Grading scale

A	94-100%	B-	80-83%	D+	67-69%
A-	90-93%	C+	77-79%	D	64-66%
B+	87-89%	C	74-76%	D-	60-63%
B	84-86%	C-	70-73%	F	<60%

COURSE SCHEDULE

¹ Specified readings below are chapter numbers in the course textbook by Ridley (2004), except S = Hall and Hallgrimsson (2008) *Strickberger's Evolution*, Jones and Bartlett Publishers, Boston [material to be provided].

Date	Topic	Readings ¹
August		
Tu 23	Introduction	
Th 25	Earth structure and change; evidence of past life	18; S 5
Tu 30	Relative and absolute dating; landmarks in the history of life	18; S 5
September		
Th 01	Plate tectonics and its effects on organisms	18
Tu 06	Patterns of diversity change over time	23
Th 08	Early history of evolutionary thought	1; S 1
Tu 13	Charles Darwin and contemporaries	1; S 2
Th 15	Rates of evolution	21
Tu 20	Rates of evolution	21
Th 22	TEST 1	
Tu 27	Variation	2
Th 29	Variation	2
October		
Tu 04	Evidence for evolution	3
Th 06	Evidence for evolution	3
Tu 11	Natural selection and variation	4
Th 13	TEST 2 (MID-TERM)	
Tu 18	Natural selection and variation	4
Th 20	Species concepts and speciation	13, 14
Tu 25	Species concepts and speciation	13, 14
Th 27	Homology and phylogeny reconstruction	15
November		
Tu 01	Phylogenetic reconstruction	15
Th 03	Phylogenetic reconstruction	15
Tu 08	FALL BREAK-NO CLASS	

Th 10	Classification and evolution; discovery and biodiversity	16
Tu 15	TEST 3	
Th 17	Evolution and geography - historical biogeography	17
Tu 22	Historical biogeography	17
Th 24	THANKSGIVING BREAK - NO CLASS	
Tu 29	Historical biogeography; Critique Paper Due	17
December		20
Th 01	Review	
Tu 13	FINAL EXAMINATION 12:00-3:00 PM, HWWE 211	

