EEES 4150/5150, **Evolution/Organic Evolution** Spring 2014 3 credit-hours Tuesday and Thursday, 11:00 – 12:15, Bowman-Oddy 1014

## **Instructors**

Dr. Mark Camp, Associate Professor of Geology, Department Environmental Sciences

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Kristen Coleman, Graduate Teaching Assistant, Department of Environmental Sciences

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**Prerequisites** EEES 2150 or BIOL 2150; CHEM 1230; or consent of instructors.

**<u>Required text</u>** Strickberger, M.W. 2008. Evolution, 4<sup>th</sup> Edition. Jones and Bartlett Publishers, Sudbury, MS. (available at campus book stores)

## **Overall Goals**

This course covers the modern theory of evolution, presented within a framework of geology and biology. The goals of this course are to:

- 1. understand the vastness of geologic time and the mechanics of geological dating.
- 2. discuss the requirements of fossil preservation.
- 3. survey the development of life through geologic time, focusing on evolution and influences of the environment.
- 4. become familiar with the specialized conditions that facilitate and promote diversification and eventual evolution of Earth's organisms.
- 5. understand the underlying principles that drive the evolution of micro- and macroorganisms.

## Tentative schedule

In addition to the book chapters noted below, additional readings will be provided when necessary. Notes for the first half of the course will be provided through the Evolution course website.

Week	Meeting Dates	Торіс	Book Chapter
1	01/07 <b>01/09</b>	SNOW DAY Molecules, Protocells and Natural Selection	Chap. 6
2	01/14 <b>01/16</b>	Molecules, Protocells and Natural Selection	Chap. 6
3	01/21* <b>01/23</b>	From Molecules to Life	Chap. 7
4	01/28* 01/30	Origins of Cells and the First Organisms	Chap. 8
5	02/04* <b>02/06</b>	<b>QUIZ I</b> (Chap. 6-8) Cell Division, Mendelian Genetics and Sex Determination	Chap. 9
6	02/11* 02/13	Chromosomes, Mutation, Gene Regulation and Variation	Chap. 10
7	<b>02/18</b> * 02/20	Species, Phylogeny and Classification	Chap. 11
8	02/25 02/27	Genes and Phylogenetic Relationships Exam I (covers lecture and lab material)	Chap. 12
9	03/04 03/06	SPRING BREAK	
10	03/11 03/13	The Concept of Geologic Time Tectonism, Plate Tectonics, Stratigraphy	Chap. 1, 5
11	03/18 03/20	Sedimentary Rocks, Stratigraphy Fossils and their Preservation	Chap. 5 Chap. 3, 5
12	03/25 03/27	Historical Development of Evolutionary Thought Darwin's Legacy	Chap. 3 Chap. 3
13	04/01	PrePaleozoic Life—adapting to chemical changes, first hardparts	Chap. 15
	04/03	The Early Paleozoic Era - larger skeletons and increasing complexity major reefs, moving to land	Chap. 14-16
14	04/08	The Late Paleozoic Era - forested landscapes, flying	Chap. 14-18
	04/10	Evolution of the Amphibians and Non-dinosaurian Reptiles Reports	
15	04/15	Evolution of the Amphibians and Non-dinosaurian Reptiles Reports	
	04/17	Evolution of the Amphibians and Non-dinosaurian Reptiles Reports	
16	04/22	Evolution of the Amphibians and Non-dinosaurian Reptiles Reports	
	04/24	Evolution of the Amphibians and Non-dinosaurian	
	04/29	κершев κероптs EXAM II (Chap. 1, 3, 5, 14-18) 12:30 – 2:30 pm	

## **Dates in bold -** in-class writing assignments \* -Lab exercise

**Grading:** Grades will be earned based on your performance on two quizzes, five short writing assignments (in class during the first half of the semester), a midterm exam, and final exam (non-comprehensive).

In addition, two "half-semester" projects (described below) will be assigned during the semester to develop a further understanding of evolution from the geological and biological perspective. Students are responsible for saving all graded assignments in case a dispute over a recorded grade occurs.

**I.** Evolution of antibiotic resistance in bacteria (50 points) - Students will learn about adaptation and selection in evolution by investigating the development of antibiotic resistance in bacteria. Students will culture *Escherichia coli*, a bacterium normally found in the gut of humans and other mammals, and expose the bacteria to antibiotics to investigate how rapidly the bacteria evolve resistance to these compounds.

**II.** Evolution of the Amphibians and Non-dinosaurian Reptiles Reports (25 points) - Each student will research a selected taxon of amphibian or reptile and report on their evolutionary developments in a 12-15 minute oral in-class presentation between April 10-24 and complete a 2-3 page synopsis to be turned in by Friday, April 25.

What	When	Worth
Quiz I	February 5 <sup>th</sup> (in class)	25 points
Writing assignments	01/07, 01/16, 01/23,	50 points total
	02/06, 02/18 (in class)	
Lab report	March 7 <sup>th</sup> (via email)	50 points
Exam I	February 27 <sup>th</sup> (in class)	100 points
Quiz II	April 1 (in class)	25 points
Dinosaur reports	April 10 - April 24	25 points
Exam II	April 29, 12:30 PM	100 points
Total points		375 points

Attendance and communication We will not take attendance. However your presence at each class meeting will greatly impact your grade. If you miss a class, it is your responsibility to get the class notes from a fellow student. Missed exams and quizzes can only be made-up if a written letter explaining the reason for the absence (including a contact phone number of doctor, mechanic, alarm clock manufacturer, etc)) is presented to the instructor *at the time of the student's next attended class.* In-class writing assignments cannot be made up. All email correspondence will be sent to your UT account.

<u>Academic dishonesty</u> Academic dishonesty in this course will not be tolerated. Examples of academic dishonesty include:

- 1. Obtaining or using work other than your own on tests, exams, quizzes or assignments.
- Unauthorized use of calculators or other programmable equipment during tests, exams, or quizzes.
- 3. Unauthorized use of study aids, answer or crib sheets.
- 4. Soliciting or providing answers on exams, tests or quizzes.

Students who violate the above policy can expect disciplinary action. Disciplinary action may consist of receiving a zero on the assignment, failing the course, being reported to the Dean of Students, or other action as deemed appropriate by the course instructors.