

BIOLOGY 270: Biodiversity and Evolution

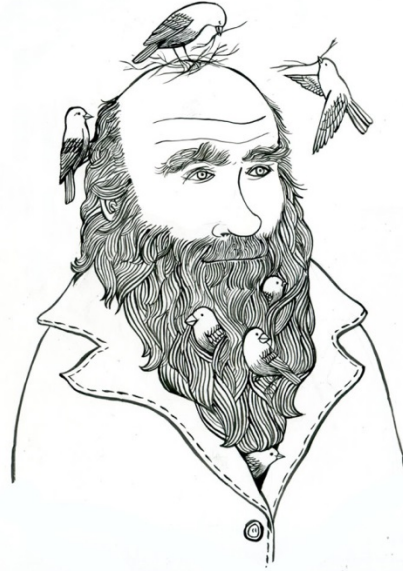
Fall 2013 Syllabus

Teaching Staff

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Course Overview

This course surveys the diversity of life, and the patterns and processes of its historical and continuing evolution. Students will be introduced to the major groups of living things and, using an evolutionary framework, learn how these groups are related to each other and how they evolved over the >3 billion years that life has existed on Earth. Emphasis is placed on the scientific approach in evolutionary biology; i.e., how new knowledge is created using morphological, geological, and molecular data. Major topics include the fossil record, constructing and interpreting evolutionary trees, speciation, extinction, coevolution, and a survey of life on Earth. In the lab, students will develop and test hypotheses using morphological and molecular data, and learn the major features of plant and animal groups.

Textbook and other readings

Our textbook is *Life: The Science of Biology*, Volume 2 by Sadava et al. (9th edition). We will also read articles from the primary scientific literature, *Scientific American*, and scholarly books for popular audiences. Apart from textbook assignments, all readings will be available for download on Moodle.

Moodle website

All lecture topics for the week, textbook readings, and supplemental materials will be posted on the Moodle webpage. I will also post my lecture slides to Moodle at the end of the week. Check Moodle often!

Grading

Your grade for the course will be based on the following materials:

Lecture Component

2 Exams	200 points
Final Exam	150 points
Evolutionary genetics problem set	15 points
GenBank assignment	10 points
Phylogenetics problem set	25 points

Adaptation project	50 points
Journal Club	20 points
Weekly readings questions	10 points

Lab Component

Phylogenetics Lab	20 points
HIV Lab	20 points
Fossil Lab	20 points
Human DNA Lab	20 points
Plant Anatomy Lab	20 points
Invertebrates Dissection Lab	20 points
Evolution/Intelligent Design	10 points

Final letter grades will be based on this scale: A = 93-100%, A- = 90-92%, B+ = 87-89%, B = 83-86%, B- = 80-82%, C+ = 77-79%, C = 73-76%, C- = 70-72%, D+ = 67-69%, D = 63-66%, D- = 60-62%.

Participation

Participation refers to coming to class, contributing during class, coming to lab, and contributing during lab. In particular, participation in lab is mandatory! Exceptions can be made for illness, athletic events, or academic events if you notify me ahead of time. Missing any lab or field trip without excuse will result in a **20-point deduction from your next exam grade**. Both lack of participation and excellent participation will be incorporated into your final grade.

Help!

My office hours for this semester are 9 to 11 on Monday and Tuesday. Outside of that, I have an open-door policy (even when it's closed). Email is also a good way to contact me if you have questions or concerns, and I'm always happy to set up a meeting time around scheduling conflicts. Finally, don't forget about your TAs – they can help, too!

MAX Center Statement: The Macalester Academic Excellence (MAX) Center, located in Kagin Commons, has peer tutors available for helping students understand mathematics and science concepts for courses in math, biology, and chemistry. Hours are 9:00 A.M. to 4:30 P.M., Monday through Friday, and 7:00 P.M. to 10:00 P.M., Sunday through Thursday. You may drop in or call 651-696-6121 during the day or x6193 in the evening to schedule an appointment. Dave Ehren and Stephanie Alden also provide mathematics and science assistance during daytime hours and some evenings, Monday through Friday.

Exam Dates:

EXAM 1:	Friday, October 4
EXAM 2:	Monday, November 11
FINAL:	Friday, December 13

Tentative Schedule of Lecture Topics (subject to change)

UNIT 1 EVOLUTION

- WEEK 1: Course Intro, Background and Basics
- WEEK 2: Microevolution – evolution within species
- WEEK 3: Macroevolution – evolution of species and higher taxa
- WEEK 4: Phylogenetics – constructing and interpreting evolutionary trees
- WEEK 5: Molecular Evolution – molecules and evo-devo
- WEEK 6: The Fossil Record

UNIT 2 BIODIVERSITY TOUR

- WEEK 7: Prokaryotes
- WEEK 8: Eukaryotes and 'Protists'
- WEEK 9: Fungi
- WEEK 10: Plants
- WEEK 11: Invertebrates
- WEEK 12: Vertebrates
- WEEK 13: Human Evolution
- WEEK 14: Wrap-up