

BIOE 109 Evolution Syllabus
Summer 2017
July 31 – Sept 1

Course Description:

This course will be an online course where we will examination of the history and mechanisms of evolutionary change. Topics include molecular evolution, natural and sexual selection, adaptation, speciation, biogeography, and macroevolution.

Instructor:

Maya Friedman

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TAs:

Joseph Hoyt

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Regina Spranger

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Contacting Us:

This term we will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, the TAs, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza. If you have any problems or feedback for the developers, email team@piazza.com.

Course Website:

If you are enrolled in the course, you should have automatically been added the Canvas course site. If you cannot access the course site, please email your instructor.

Required Texts:

Evolution: making sense of life by Carl Zimmer and Douglas J. Emlen

Recommended Texts:

Origin of species (1st edition!) by Charles Darwin (available online, link on Canvas)

The Selfish Gene by Richard Dawkins (available online, link on Canvas)

Online lectures:

Lectures are organized into modules, which are composed of several 15-20 minute video lectures (see schedule below). You are responsible for viewing these lectures during the week they are assigned. Video lectures will remain available throughout the course however; you **MUST COMPLETE EACH MODULE** before proceeding to the next module in the series. After you have completed a module, there will be a short quiz to help you test yourself on the lecture material and unlock the next module in the series.

Weekly Quizzes (in lieu of a midterm):

There will be **three** online quizzes at the end of weeks 1-3 instead of having a single midterm. These are separate from, and in addition to the module quizzes to unlock the next module in the series. These will be conducted through Canvas. They are intended to help you test yourself on the lecture material.

They are open note/book but are **NOT GROUP ASSIGNMENTS**. Be sure to carefully read the instructions when taking these quizzes. There are **no** make-ups and the lowest quiz will **not** be dropped. Unless otherwise specified, **quizzes for the week will be closed by SUNDAY night at 11:59pm**.

Readings:

Readings for each week will typically include one or more chapters from the textbook plus one scientific paper from the primary literature. Primary literature readings will be available on the course website (Canvas, see below for schedule). The primary literature readings will be discussed during asynchronous discussion sections and will be on the quizzes.

Discussion “sections”:

Discussion sections will be in the form of asynchronous discussion forums (discussion forums that you can contribute to over time) on Canvas. These forums will be composed of guiding questions relating to the recent lectures and the readings from the primary literature. Participation in these discussion forums will be counted towards your final grade.

Virtual Office Hours & Contacting Us:

Students are **enthusiastically** encouraged to attend the virtual office hours of your instructor and TAs. Virtual office hours will be conducted via Zoom.us. You will find a link to your our private meeting rooms on Canvas. You are welcome to come with specific questions or to just “talk biology.” These office hours will generally be group question and answer periods. If you have a private question/issue to discuss, please contact us ahead of time to make an appointment.

Writing Assignments:

This course fulfills the DC writing requirement. You will be asked to write 2 3-page assignments based on the SimBio (SimBio.com) virtual labs as well as a 3-page research proposal (rough and final draft). Writing assignments, unless otherwise specified, are due online (via Canvas) as indicated by the schedule below. Late assignments, including those turned in the same day after the time specified, will be docked 10% for each day that it is late.

Writing assignments will be based on 2 virtual labs supplied by SimBio.com

Week	Release Date	Assignment	Assignment Due Date
1	Monday July 31	Darwinian snails (simbio)	Sunday Aug 7
2	Monday Aug 7	Proposal 1 st draft	Sunday Aug 13
3	Monday Aug 14	How the guppy got its spots (simbio)	Sunday Aug 20
4	Monday Aug 21	Proposal final draft	Sunday Aug 27

Writing Assignments (cont'd):

The writing assignments will be due the following **Sunday at 11:59 pm**.

You will be emailed an invitation to enroll on the SimBio web site where you will be able to register and download the labs. The labs each cost \$6.00 (\$12 total for the quarter).

FINAL EXAM:

Exams for this course will be taken through the online proctoring service ProctorU. You will need a webcam, microphone, and stable internet connection to use ProctorU. Before you begin your exam, the online proctor will ask you to show a photo ID. The proctor will monitor your computer screen and the room in which you are taking the exam. You will be allowed a calculator and scratch paper. You will NOT be allowed to search the web, look at your notes or book. Exam fees are \$25. You must schedule your exam at least 72 hours in advance.

Academic integrity:

Cheating will not be tolerated. Cheating during tests will result in a zero and may result in a failing grade in the class. By enrolling in the university, students are automatically agreeing to abide by policies, including those on academic misconduct. Academic integrity and scholarship are core values that should guide our conduct and decisions as members of the UCSC community. Plagiarism and cheating contradict these values, and so are very serious academic offenses. Penalties can include a failing grade in an assignment or in the course, or suspension or expulsion from the university. Students are expected to familiarize themselves with and follow citation practices (<http://nettrail.ucsc.edu/ethics/index.html>) and the university's Rules of Conduct regarding student conduct and discipline: <http://www2.ucsc.edu/judicial/handbook.shtml>.

DRC accommodations:

UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student with a disability who requires accommodations to achieve equal access in this course, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to me via email, preferably within the first two weeks of the quarter. At this time, I would also like us to discuss ways we can ensure your full participation in the course. I encourage all students who may benefit from learning more about DRC services to contact DRC by phone at 831-459-2089 or by email at drc@ucsc.edu

Grading:

Weekly Quizzes (3x): 30%

Final Exam: 30%

Simbio writing assignments (2x): 20%

Research proposal 1st draft: 5%

Research proposal FINAL draft: 10%

Participation: 5%

IMPORTANT NOTE:

As this is a summer session class, everything is **VERY fast-paced**. We fit everything required of the normal 10-week offering into half the time! Therefore, to succeed in this class will require **sustained effort and participation**. Cramming interspersed with periods of inactivity will not be a successful strategy!

Weekly Schedule (see next page):

DATES	MODULES	TEXTBOOK
Week 1		
<i>Introduction</i>		
JULY 31- AUG 4	Intro to Evolution: Selection, Inheritance, and History <ol style="list-style-type: none"> 1. What IS evolution? 2. Early naturalists & their contributions 3. Introduction to natural selection 4. Evidence for evolution 	Ch. 2 Zimmer & Emlen
	Review: Basic transmission genetics <ol style="list-style-type: none"> 1. Raw material for evolution 2. Mutations: creating variation 3. What did Mendel figure out? 4. Relationship between genes & the environment 	Ch. 5 Z&E
Week 2		
<i>Microevolution: selection, drift, mutation & migration</i>		
AUG 7- AUG 11	Population genetics <ol style="list-style-type: none"> 1. Hardy-Weinberg equilibrium (HWE) 2. Mechanisms of evolution I 3. Mechanisms of evolution II 4. Selection in peppered moths 5. Violating HWE 6. Interplay between drift, gene flow, selection 	Ch. 6 Z&E
	Quantitative genetics & the evolution of phenotypes <ol style="list-style-type: none"> 1. HWE to polygenic traits 2. Types of selection on quantitative traits 3. Examining complex traits 	Ch. 7 Z&E
	Adaptation <ol style="list-style-type: none"> 1. The adaptionists program 2. How do we study adaptation? 	Ch 10 Z&E
Week 3		
AUG 14- AUG 18	Sex: Causes & Consequences <ol style="list-style-type: none"> 1. How & why did sex evolve? 2. Sexual Selection 3. Types of sexual selection 4. Sex ratios 	Ch. 11 Z&E

DATES	MODULES	TEXTBOOK
Week 3 CONT'D		
AUG 14- AUG 18	Evolution of life history 1. Life history traits & trade-offs 2. Lack's hypothesis: how much to invest?	Ch 12 Z&E
	Kin Selection 1. Inclusive fitness & Hamilton's rule 2. Kin recognition & reciprocal altruism	
Week 4		
AUG 21- AUG 25	Macroevolution: speciation & extinction	
	Tree of life & phylogenies 1. Phylogenetic Inference 2. Building a tree	Ch 13 Z&E
	Species & Speciation 1. What IS a species? The species checklist 2. Mode of speciation 3. Speed of speciation & special issues	Ch 4 Z&E
	History of life 1. What is life? 2. Origins: from cells to eukaryotes 3. Macroevolutionary patterns	Ch 14 Z&E
	Evolution & Development 1. Heterochrony: 3 dimensions 2. Homeotic genes	
Week 5		
AUG 28 - AUG 30	Coevolution 1. Raw materials of coevolution 2. Antagonistic & mutualistic interactions	Ch 15, 16 Z&E
	Human Evolution 1. Early Human Evolution 2. Evolution of Homo 3. Brains, language & culture	Ch 17, 18 Z&E
FINAL EXAM AUG 31st, Time: By appointment		