BIOE 109 Evolution Syllabus
Summer 2018
July 30 – Aug 31

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
Email: mfriedma@ucsc.edu
Office Hours: Fri 11a-12p

TAs:
Luz de Wit
Email: ldewit@ucsc.edu
Office Hours: Thurs 11a-12p

Remy Gatins
Email: rgatins@ucsc.edu
Office Hours: Wed 10a-11a

Contacting Us:
This term we will be using Piazza- The system is highly catered to getting you help fast and efficiently from classmates, the TAs, and me! Rather than emailing questions, I encourage you to post your questions on the Piazza forum. If you prefer, you can also send private messages to the teaching staff or mark your posts to be shared anonymously. As a last resort you can email us directly, but PLEASE put "Bioe 109" in the subject line of your emails if you do so. Lastly, if you have any problems or feedback for the developers, email team@piazza.com.

Virtual Office Hours:
Students are **enthusiastically** encouraged to attend the virtual office hours of your instructor and TAs. Virtual office hours will be conducted via https://zoom.us/ You will find a link to our private meeting rooms on Canvas. You are welcome to come with specific questions or to just "talk shop." 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.

Course Website: https://canvas.ucsc.edu/
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 (.pdf available online, link on Canvas)

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

Important Deadlines:
Financial Aid Disbursement: July 23
Add: Thursday, August 2
Drop: Monday, August 6 (tuition refund*)
Change Grade Option: Friday, Aug. 10
Withdraw: Friday, Aug. 17 (no refund)
Final exam: Friday, Aug 31
Grades Due: Thursday, Sept 6

A Note on Canvas:
Like most websites, Canvas tracks your activity, including which pages you've visited, when, and for how long. All submissions (assignments, quizzes, discussion forums) are time-stamped, which means that your instructor can see exactly when you turn your work in.

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. You grade on these quizzes will not count towards your grade and you can retake these quizzes as many times as you like

Weekly Quizzes (in lieu of a midterm):
There will be **three** graded 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 that unlock the next module in the series. These will be conducted through Canvas.

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**.

Discussion "sections":
These will not be like traditional sections that you may be familiar with- but rather will take place in the form of **asynchronous** discussion forums (meaning that you can contribute to them over time) on Canvas. These forums will be composed of guiding questions relating to the recent lectures or readings from the primary literature. Participation in these discussion forums will be counted towards your participation grade.

Reading assignments:
Readings for each week will typically include one scientific paper from the primary literature plus supplemental chapter(s) from the textbook. Primary literature readings will be available on the course website (see below for schedule). The primary literature readings will be discussed during discussion forums and will be on the quizzes.

Writing Assignments:
This course fulfills the DC writing requirement for UCSC. Over the duration of this course you will be working on 3-page research proposal on a topic of your choice. I will also provide a few template studies that you can work from, if you are having a hard time coming up with your own study system/questions.

This assignment will be broken up into a few component parts, which will be due online (via Canvas) as indicated by the schedule below**. Late assignments will be docked 10% for each day that it is late.** The writing assignments will be due the following **Sunday at 11:59 pm** from the date posted unless otherwise noted

Week	Release Date	Assignment	Assignment Due Date
1	Monday July 30	Topic statement & literature review	Sunday Aug 5
2	Monday Aug 7	Experimental design worksheet	Sunday Aug 12
3	Monday Aug 14	Proposal rough draft	Sunday Aug 19
4	Monday Aug 20	Peer review	Sunday Aug 26
5	Monday Aug 20	Proposal final draft	**Wednesday Aug 29**

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. **The final exam is NOT open book.** 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:
30% Weekly Quizzes (3x 10%)
30% Final Exam
35% Writing assignments:
- Research topic (*5%)*
- Experimental design worksheet: (*5%)*
- 1st draft Research proposal: (*10%)*
- Peer review: (*5%)*
- FINAL draft Research proposal: (*10%)*

5% Course Participation

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	READINGS
Week 1		
JULY 30-AUG 5	***Introduction***	
	Intro to Evolution: Selection, Inheritance, and History 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 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
	DUE BY SUNDAY 8/5 @ 11:59PM 1. Contribute to Discussion on reading 2. Quiz #1 3. Proposal topic	Darwin & Wallace (1858)
Week 2		
AUG 6-AUG 12	***Microevolution: selection, drift, mutation & migration***	
	Population genetics 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 1. HWE to polygenic traits 2. Types of selection on quantitative traits 3. Examining complex traits	Ch. 7 Z&E
	Adaptation 1. The adaptionists program 2. How do we study adaptation?	Ch 10 Z&E
	DUE BY SUNDAY 8/12 @ 11:59PM 1. Contribute to Discussion on reading 2. Quiz #2 3. Experimental Design worksheet	Grant & Grant (2002)

DATES	MODULES	TEXTBOOK
Week 3		
AUG 13- AUG 19	***Microevolution: selection, drift, mutation & migration***	
	Sex: Causes & Consequences 1. How & why did sex evolve? 2. Sexual Selection 3. Types of sexual selection 4. Sex ratios	Ch. 11 Z&E
	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 & Hamiltons's rule 2. Kin recognition & reciprocal altruism	
	DUE BY SUNDAY 8/19 @ 11:59PM 1. Contribute to Discussion on reading 2. Quiz #3 3. Proposal rough draft	Heath et al (2003)
Week 4		
AUG 20- AUG 26	**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	
	DUE BY SUNDAY 8/26 @ 11:59PM 1. Contribute to Discussion on reading 2. Peer review of proposal 3. FINAL DRAFT **DUE 8/29**	Ceballos et al (2017)

DATES	MODULES	TEXTBOOK
Week 5		
AUG 27 - 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		