



# Evolutionary Biology

Bio 380

## Instructor Info —



Andrew Kern



Office Hrs: Mon 10:30-11:30,  
Fri 2:30-3:30p



Mon: PAC301; Fri: Zoom Meeting  
ID: 991 8344 2530



<http://kr-colab.github.io>



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## Course Info —



Prereq: None



MWF



1-1:50PM



Chapman Hall 220 and Zoom  
Meeting ID: 972 0814 9268

## Discussion Info —



Wednesdays



3 sections available for signup



See Canvas for Zoom info

## TA Info —



Savanah Bird



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Clara Rehmann



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## Overview

This course focuses on the processes that create and maintain genetic variation within and between populations of organisms, from man to the lowliest worms. These forces are inherently evolutionary, thus we will pay particular attention to the myriad ways in which evolution acts to shape genomes. Topics covered will include population genetics, evolution by natural selection, concepts of fitness and adaptation, the genetic bases of evolutionary change, quantitative genetics, genetic mapping, molecular evolution, and phylogenetics.

## Material

### Required Texts

#### Course Notes

I will provide detailed lecture notes as well as all of the slides I present during the term. The lecture notes will be the primary source of written material that I will test on while the text will augment and flesh out those subjects that I cover. I'm currently in the process of turning these notes into a more convenient book format that is available here

Beyond the course notes, there will be half a dozen additional papers that we will cover in Discussion section. These additional readings can be found on the Canvas site.

### Recommended Text

Futuyma, D. J. 2005. *Evolution, 2nd Edition*. Sinauer Associates, Sunderland, Massachusetts

Note this version is out-of-date. This is a deliberate choice so that you can pick up copies from Amazon via loose leaf for around \$14.

### Discussion Section Readings

Required journal articles and book chapters will be provided on Canvas.

## Grading Scheme

55%	Take Home Exams (2)
20%	Problem sets
15%	Canvas assignments
10%	Discussion participation

There will be no curve applied (e.g. everyone can possibly get an A)

## Learning Objectives

- Become familiar with the forces that shape the evolutionary history of biological organisms
- Learn to appreciate the intricacies of genetic variation and the limits to which it underlies phenotypic variation
- Improve our quantitative reasoning (i.e. do some math!), using evolution as our platform.
- Learn to critically read primary literature in Evolutionary biology and discuss it with your peers.

# FAQs

## ? Do we have to do math in this course?

! Yes, we to study evolution you need to do math. That said, if you passed Algebra II you have the chops it will take. Often the hardest part of the math we will do in this class is in understanding its connection to the biology

## ? Can I study evolution even if I don't believe in it?

! Absolutely. As you'll see there is little difference between studying say physics with the way we were treat evolutionary biology.

## ? Why take home exams?

! Exams are a tool of limited utility for pedagogy in my honest opinion. While that is so student assessment is important, so we have to do something! I prefer to make a harder exam that you have to actually think on rather than be forced to regurgitate info back in a limited time.

## ? Do humans evolve?

! Indeed humans are a product of evolution, just as is every other biological entity. We will cover the evolutionary history of our own species in detail during this class.

## Make-up Policy

Make-up exams or assignments will be allowed if needed. I can only believe that this term will provide a multitude of challenges on both the instructors' end and well as on your own. With patience and caring I am confident that we can have an excellent term.

## General Guidelines for Remote Class Participation

While officially we are in-person this term I encourage you to stay at home if you feel at all sick or have been in contact with folks that may be sick. To ease this I'm going to try to broadcast lectures live via Zoom using the classroom HyFlex setup (bear with me...) and will also record these broadcasts.

Questions via the zoom system will be harder to deal with. Please try to stop me if you have a question that I've missed!

## Diversity and Inclusivity Statement

I consider this classroom to be a place where you will be treated with respect, and I welcome individuals of all ages, backgrounds, beliefs, ethnicities, gender identities, religious affiliations, sexual orientations, and abilities. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class.

## Accommodations for Students with Disabilities

I strongly encourage students with disabilities, including "invisible" disabilities like chronic diseases, learning disabilities, and psychiatric disabilities to discuss with me as soon as possible what appropriate accommodations might be helpful to them. You are also encouraged to contact the Accessible Education Center in 164 Oregon Hall at 541-346-1155 or [uoac@uoregon.edu](mailto:uoac@uoregon.edu).

## Academic Integrity

The University Student Conduct Code defines academic misconduct, which includes unauthorized help on assignments and examinations and the use of sources without acknowledgment. Academic misconduct is prohibited at UO. I will report misconduct to the Office of Student Conduct and Community Standards—consequences can include failure of this course. I will ask you to certify that your exams/papers are your own work. Exams are downloaded from Canvas and are take home. I have designed them with the expectation that you will have access to course materials and the Internet when you take them—and that's just fine. I will be looking to see evidence of critical thinking and your ability to put the concepts we're working on into action in response to the exam prompts.

## Class Schedule

### Introductory Material

Date	Topic	Futuyma Chp.	Discussion Reading	HW
27-Sept	Course details + Why Study Evolution?	-	-	-
29-Sept	History of, and Evidence for, Evolution	1	Organize	-
1-Oct	Basics of Genetic Variation	8	-	Canvas 1
4-Oct	Genotypic and Phenotypic Variation	8	-	-

### Microevolution

6-Oct	Intro to Population Genetics	9	Dawkins	-
8-Oct	Natural Selection: Adaptation	11	-	Canvas 2
11-Oct	Natural Selection: Population Genetics	12	-	-
13-Oct	Mutation and Migration	10	Gould and Vrba, Gould and Lewontin	-
15-Oct	Genetic Drift	10	-	Problem Set 1 due
18-Oct	Integration of Evolutionary Forces	Review 9-12; 20	-	-
20-Oct	Linkage and Recombination	9	Simulation lab	-
22-Oct	Molecular Evolution	20	-	-
25-Oct	Exam 1 (Covers through Mol Evol)	-	-	-

### Phenotypic Evolution

27-Oct	Quantitative Genetics: the classics	13	Novembre et al	-
29-Oct	Quantitative Genetics: mapping disease alleles	13	-	Problem Set 2 due
1-Nov	Levels of selection	11	-	-
3-Nov	Evolution / Genetics of Behavior	16	Dorus et al	-
5-Nov	Sexual Selection	15	-	Canvas 3
8-Nov	Mental Health Day (No Class)	-	-	-

### Macroevolution

10-Nov	Systematics	2	Colosimo et al.	-
12-Nov	Phylogenetic Inference	2	-	Canvas 4
15-Nov	Species Concepts	17	-	-
17-Nov	Models of Speciation	17	Coyne and Orr	-

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19-Nov	Genetics of Speciation	18	-	Problem Set 3 due
22-Nov	Human Evolution and Diversity	4	-	-
24-Nov	Diversity and Evolution of life	5	Green et al.	-
26-Nov	Thanksgiving	-	-	-
29-Dec	Macroevolution	22	-	-
1-Dec	Exam 2	-	-	-

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