

BIOL 336: Fundamentals of Evolutionary Biology
Term 2, January 2016

Instructors

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Lecture Sections

Section 201: Tues, Thurs 11:00-12:30, BIOL 2000
Section 202: Tues, Thurs 2:00-3:30, WESB 100

Overall Course Learning Objectives

1. Appreciate the central position of evolution in life sciences and how it relates to your own life.
2. Understand that all of life is related through common ancestry and that evolution is an ongoing process.
3. Develop a solid basic understanding of how evolution works, from the origin and spread of genetic variation in populations, to the origin of novel traits, new species and lineages, to the major evolutionary transitions, and the shape of the tree of life.
4. Understand the types of evidence for evolution and examples of the methods and approaches that scientists use to gather and to evaluate evidence of evolution.

Prerequisite

Biol 234 Fundamentals of Genetics is a prerequisite for this course. We will assume that you have a solid basic genetics background, including an understanding of transmission genetics, and familiarity with concepts and terms such as gene, allele, haploid, diploid, recombination and mutation.

Textbook (required)

Evolution: Making Sense of Life 2nd edition by Carl Zimmer and Douglas Emlen 2015.
You may use the 1st edition, but some sections have changed. Electronic versions are also available.

Policy on Absences

If you have an ongoing issue that is preventing you from keeping up with your work, please come and talk to one of the course instructors as soon as possible, so that resources can be identified to support successful course completion.

For short absences, you are responsible for making up material and submitting assignments during absences. All late submissions are subject to penalty or may not be accepted unless absences are documented in a timely fashion. Check below for details on policies for missed midterms, lectures, tutorials and pre-readings. It is your

responsibility to contact the instructors as soon as you know you will be absent, or when you return from unforeseen absences.

Academic Honesty

Plagiarism or any form of cheating is not tolerated in this course. Please see the UBC rules on Academic Honesty and Standards at www.science.ubc.ca/students/new/conduct.

These rules apply to all exams and assignments (including in class clicker questions).

Breakdown of marks

Pre-reading quizzes	5%
iClicker questions (in lecture)	3%
Short opinion papers (SOP1: 6%; SOP2: 8%)	14%
Tutorials	18%
Exams (60% total)	
Midterm I (Feb 9, lectures 2-9, tutorials 1-4)	16%
Midterm II (Mar 15, lectures 10-16, tutorials 5-7)	14%
Final Exam	30%
Lectures 17-24, tutorials 8-10:	16%
Comprehensive portion:	14%

Course Website

The course website is on Connect (connect.ubc.ca). You will use the site to access pre-reading quizzes, lecture outlines, slides (posted after lectures), and tutorial materials.

Pre-reading quizzes

- You will have pre-reading quizzes on Connect to aid preparation for upcoming lectures. They will typically be available at 5pm on Fridays, and will be available until 9 PM, the evening before each lecture.
- Your lowest pre-reading quiz mark will be dropped.

iClicker questions

- We use clickers to encourage lecture attendance, active involvement and learning in lecture, and to get and give feedback on understanding of concepts.
- Questions will be marked on participation, but trying to get the correct answer will help test your understanding.
- You can miss up to two classes worth of clicker questions without penalty.
- Register your clicker through the Connect site.
- Your clicker responses will be recorded from either of the lecture sections.

Short Opinion Papers (SOPs)

Writing is a core skill for all scientists, and a skill that we will focus on throughout this course. You will write two very short papers; the first will count for 6%, the second for 8% of your course mark. SOP1 is due on Feb 25th; SOP2 is due on April 7th, hand-in during lecture.

Tutorials

- Tutorials are held weekly and are a mandatory and important part of the course.
- Tutorials complement and augment the material covered in lecture, and include readings, examples and problems sets that supplement those covered in lectures.

- Your tutorial grade will be based on a combination of pre-tutorials, in class assignments and participation. Each week's tutorial is equally weighted, and the lowest week's mark will be dropped.
- Pre-tutorial assignments will be posted by 5PM on Friday, for the following week's tutorial.
- Tutorial material is subject to examination on midterms and on the final.
- You must attend the tutorial section for which you are registered. Your TA will inform you of specific policies and expectations for tutorials.

Exams

Exams will be mixed format, including short and longer answer questions, including solving problems, and interpreting responses. Exams can cover materials from lectures and tutorials.

The final exam will include a section that covers lectures and tutorials after midterm II, as well as a comprehensive portion with questions spanning two or more course sections.

There will be no make-up midterms. Students who legitimately miss a midterm will have these marks re-assigned to the cumulative portion of the final exam. It is your responsibility to explain your absence from a midterm within a week of the missed exam.

Tentative Schedule

Week	Dates	Lecture Topic	Tutorial
1	Tues Jan 5	A map of evolution & of the course	NO TUTORIAL
	Thurs Jan 7	Understanding phylogeny	
2	Tues Jan 12	Why genetic history matters	Beach mice paper
	Thurs Jan 14	Depth and breadth of the tree of life	
3	Tues Jan 19	Genetic drift: the role of chance	Phylogenetics
	Thurs Jan 21	Natural selection, fitness and change	
4	Tues Jan 26	Long term outcomes of selection	Pop Gen problems on drift and selection
	Thurs Jan 28	Mutation: where variation is born	
5	Tues Feb 2	Where genes and genomes come from?	Pop Gen problems on selection and mutation
	Thurs Feb 4	The consequences of genetic linkage	
6	Tues Feb 9	MIDTERM I	TBA
	Thurs Feb 11	Gene trees & human genetic history	
	Feb 16-20	Mid-term Break	
7	Tues Feb 23	Understanding complex traits	Lactase paper
	Thurs Feb 25	Adaptation is everywhere (or not)!	
8	Tues Mar 1	Varying selection over space and time	Snail speciation
	Thurs Mar 3	Why is adaptation so difficult?	
9	Tues Mar 8	Coevolution, conflict & cooperation	NO TUTORIAL
	Thurs Mar 10	Life history evolution	
10	Tues Mar 15	MIDTERM II	Biodiversity Exploration
	Thurs Mar 17	Why reproductive systems matter	
11	Tues Mar 22	Sexual selection	Human Evolution
	Thurs Mar 24	Species and species concepts	
12	Tues Mar 29	The evolution of barriers between species	Widowbirds
	Thurs Mar 31	Speciation: rapid and slow births of species	
13	Tues Apr 5	The success of clades	Review
	Thurs Apr 7	TBA	