

EEB 390: EVOLUTION

Course Description and Learning Goals

EEB 390 is a lecture and discussion course that covers the fundamentals of evolutionary biology. It includes a historical survey of the development of evolutionary theory, phylogenetic systematics, natural selection, population genetics, molecular evolution, genomics, and macroevolution. Three exams will be given to test students' knowledge of the concepts presented in the lectures and reading materials. Lectures cover topics presented in the textbook but are supplemented with information from a broad range of sources. Weekly discussions will focus on primary literature and will relate to topics covered in lecture or recent developments. A term paper covering a topic in evolutionary biology will be required, including peer-review.

By the end of this course, you will have mastered the following:

- Working knowledge of basic evolutionary principles
- Understanding of how scientists study evolution
- Ability to assess and discuss published research in evolution

Textbook and Readings

CARL T. BERGSTROM • LEE ALAN DUGATKIN



SECOND EDITION

evolution

Bergstrom & Dugatkin. 2016. *Evolution (Second Edition)*. Please read assigned sections from the text before attending lecture. In a few cases, the lecture will focus on a subject that is not directly addressed in any chapter of the textbook. For those, supplemental texts may be recommended on Canvas [Modules]. Assigned readings for discussion sections are available on Canvas [Resources/Readings for Discussion Sessions].

Term Paper Guidelines

Students are required to prepare and submit a paper on a topic in evolutionary biology. Additional information on the paper assignment will be given during the first week of discussion sections, and a more complete description of this assignment is available in Canvas. In brief, students are required to (i) submit a proposed topic for their paper and at least five annotated sources during the week of **February 7th**, (ii) submit

Course Info

Lecture:

Tuesday & Thursday
3:00-4:00pm, 2260 USB

Sections:

Mon 9:00-11:00am 3401 MH
Wed 9:00-11:00am 3254 LSA
Wed 12:00-2:00pm G449 MH
Wed 3:00-5:00pm 2244 USB

Final Exam:

Mon, April 25th, 2260 USB
10:30am-12:30pm

Course website: [Canvas](#)

Instructor Info

Dr. Alison Davis Rabosky

ardr@umich.edu
2064 Biological Sciences Bldg.

Office hours:

Monday 10:00am -12:00pm or
by appointment (email)

Graduate Student Instructors:

Giorgia Auteri:
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Rachel Wadleigh:
wadleigh@umich.edu

Textbook

Bergstrom & Dugatkin. 2016.
Evolution (Second Edition). W. W.
Norton & Co., New York.

Required

a draft of their paper for peer review by a fellow student during the week of **March 7th**, (iii) peer review a fellow student's paper and submit it during the week of **March 28th**, and (iv) submit a final draft of their paper through Canvas by **5pm on April 15th**. Scores assigned for the paper assignment are rigorously determined (see Grading Criteria handout on Canvas) and are not easily changed. Plagiarism is unacceptable; papers that contain plagiarism in any form will be assigned a score of zero ([LSA Academic Integrity information](#)).

Discussion Section

The first discussion section occurs during the week of January 10, 2022. Articles for each discussion section are posted on Canvas. Students are required to submit short summaries (1-2 paragraphs per paper) of the papers that are discussed each period. These summaries should identify the major themes of the papers and will be graded for content. Sets of 2-4 students will sign up during the first meeting to lead discussion sections (your GSI will lead the first discussion). Scores for discussion section are based on quality of the discussion section that you participate in leading (34 points), your contribution to discussion (33 points; 3 points for each session) and submitted summaries (33 points; 3 points for each session). Week #1 work is mandatory, but these scores will not count in your final total. Discussion sections that occur in weeks prior to exams will include a short review session.

Grading

Exams will include short-answer, multiple-choice and small essay questions that are based on lecture material and assigned readings from the text and discussion sections. Examples of exam questions will be posted before the first exam. Final grades will be based on performance on examinations, participation in discussion sections, and performance on the paper assignment as outlined below (600 points total):

- **Two exams (February 3 and March 17):** 100 points each (200 points total)
- **One final exam, partially cumulative (April 25):** 150 points
- **Lecture attendance/engagement:** 50 points
- **Discussion section participation (assigned by GSIs):** 100 points
- **Term Paper:** 100 points

Letter grades will be determined based on the following grading scale according to the percentage of total points earned: A+ = 97-100%, A = 93-97%, A- = 90-93%, B+ = 87-90%, B=83-87%, B- = 80-83%, C+ = 77-80%, C = 73-77%, C- = 70-73%, D+ = 67-70%, D = 63-67%, D- = 60-63%, E < 60%.

Course Policies

- **Attendance and Makeups:** You are expected to attend all lectures and your corresponding discussion section. Lecture slides will be posted as PDF files on Canvas [Resources/Lectures], but they should not be considered a substitute for attending lectures! Please notify Dr. Davis Rabosky as soon as possible if you have a legitimate conflict with an exam date, or in the case of a documented emergency, to arrange any make-up exams. Unexcused absences during exams are unacceptable and will result in a zero for the exam.
- **Accommodation:** If you need an accommodation based on the impact of a disability, please let Dr. Davis Rabosky know at your earliest convenience. We are happy to work with you and the Office of Services for Students with Disabilities (<https://ssd.umich.edu>; 734-763-3000) to help us implement personalized academic accommodations. Any information that you provide is private and confidential and will be treated as such.

Lecture Schedule

Date	Topic	Reading
January 6	On the Origin of Species/Why Study Evolution?	Chapter 2
January 11	Modern Synthesis and Molecular Revolution	Chapter 3
January 13	Phylogenetic Trees and Trait Evolution	Chapter 4
January 18	Sources of Genetic Variation	Chapter 6
January 20	Population Genetics	Chapter 7
January 25	Genetic Drift and Neutral Evolution	Chapter 8
January 27	Evolution at Multiple Loci	Chapter 9
February 1	Fitness Landscapes/Quantitative Genetics	Chapter 9
February 3	Exam 1 (3:00-4:00pm, 2260 USB)	
February 8	Species and Speciation	Chapter 14
February 10	Inferring Phylogenetic Trees	Chapter 5
February 15	Genome Evolution	Chapter 10
February 17	Eukaryotes and Multicellularity	Chapter 12
February 22	History of Life and the Fossil Record	Chapter 11
February 24	Biodiversity and Biogeography	
<i>March 1, March 3</i>	<i>No class: Spring Break!</i>	
March 8	Macroevolution	Chapter 15
March 10	Extinction	Chapter 15
March 15	Guest Lecture: Macroevolution Meets Biogeography	
March 17	Exam 2 (3:00-4:00pm, 2260 USB)	
March 22	Phenotypic Plasticity	
March 24	Evolution of Sex and Sexual Selection	Chapter 16
March 29	Cooperation and Conflict	Chapter 17
March 31	Coevolution	Chapter 18
April 5	Life History Evolution	
April 7	Evolution and Development	Chapter 13
April 12	Evolution of Infectious Diseases	
April 14	Evolution and Human Health	Chapter 20
April 19	Human Evolution	Chapter 19
April 25	FINAL EXAM: 10:30am-12:30pm, 2260 USB	