



USC Dornsife

Dana and David Dornsife
College of Letters, Arts and Sciences

BISC 180Lxg: Evolution

4 units

Spring 2023—Mon/Wed/Fri— 10:00 - 10:50 am

Lecture hall: ZHS 352.

Instructor: Dr. Trond Sigurdson

Office: AHF 139

Office Hours: Wednesday 11:00 am – 1:00 pm

Contact Info: Email: sigurdse@usc.edu

Laboratory Times and Location:

M, W or F: 12:00 - 1:50 PM, ZHS 257

Recommended Texts:

- *Evolution, 4th edition*, by Futuyama and Kirkpatrick, 4th edition. Sinauer Press
- Other texts will be provided on Blackboard or as printouts

Course Description:

Evolution is the unifying principle of all biology but the importance of its study is not restricted to biologists. Understanding evolution is of paramount importance to comprehending the “why” and “how” of nature and modern human variation. This course provides students from all disciplines with a background in evolution that will also prepare them to think critically about a wide range of everyday issues including healthcare and the origin of human society.

Learning Objectives:

The course will use a combination of lecture and laboratory meetings to provide students with a basic understanding of the scientific method and how it has been employed in the study of evolution. Lecture topics will range from principles of evolution and the history of scientific discovery to contemporary issues of human medicine and agriculture. Laboratories will take many forms, including experimental data collection and interpretation, field trips to local natural history collections, simulations of natural processes, and group discussions of scientific papers. The course will be divided into two parts: In the first part of the class, students will learn about the history of evolutionary theory and encounter evidence for evolution in examples of natural selection and a tour through the fossil record. In the second part of the course, the focus will shift to human evolution. These topics will be paired with laboratory exercises that address the interpretation of the hominid fossil record and the acquisition of complex human behaviors.

In the third part of the class (weeks 11-15), students will explore the many ways in which the human race has modified its environment, both for better and for worse. The human practice of artificial selection will be illustrated by highlighting examples of the domestic animals and plants upon which our society is dependent. This part of the course will analyze the consequences of human practices in terms of disease and environmental contamination. In lab students will

simulate the spread and containment of an emerging disease from an epidemiological perspective. Lab meetings will also be devoted to student presentations on the topic of communicating science to the public.

Prerequisite(s): None

Co-Requisite(s): None

Website: <https://blackboard.usc.edu>

Exams: The lecture portion of this course will include one midterm examination and a final examination. Both examinations (midterm and final) may include multiple choice questions, fill-in answer, short answers, short essays, definitions, and quantitative problems. The final examination will be cumulative but also weighted towards material covered in the final third of the course.

Lab Presentations

The last two weeks of the semester will be devoted to 70-point student presentations on topics of the students' choice related to evolution and aimed at a general (non-academic) public. Detailed instructions and guidelines, including deadlines for topic submission, will be posted on Blackboard.

Note on absences

Attendance to both lectures and labs is important. Chronic missed classes will adversely affect your performance. More than two unexcused absences in the lab can result in a failing grade for the lab portion of the course.

Grading Timeline

Grades for Midterm Exams will be posted within one calendar week following the exam date.

Grading Breakdown

Assignment	% of Grade
Midterm	30
Final Exam	30
Oral Presentation Project	10
Laboratory assignments	30
Total	100

Grading Scale

The course grade will be based upon 500 possible points. However, with the exception of unusual circumstances, the highest scoring student is assumed to be at 100%. Final grades will be determined as a percentage of the highest score (e.g. if the highest scoring student is at 490 points total, then the B- starts at 80% of 490 =392 points, C- starts at 70% of 490=343 etc).

Schedule of lecture and lab topics. *Note that the schedule is subject to change. Any schedule changes will be discussed in class and posted on Blackboard.*

Week	Dates	Lectures	Labs
1	Jan 9- Jan 13	Before Darwin; Aristotle to Lamarck. Darwin, Wallace, and natural selection	Scientific method. Evolution, science, and religion
2	Jan16- Jan 20	MLK Day Monday no lecture. Evolutionary trees, Evol. Synthesis.	No labs
3	Jan 23- Jan 27	Adaptations, genetics, Mendel, mutations, genetic disease, sickle cell	Video Worksheet: Life's Rocky Start
4	Jan 30- Feb 3	Directional, disruptive, stabilizing selection, genetic drift, gene flow	Genetics, and natural selection
5	Feb 6- Feb 10	What are species? Speciation, biological sex	Papers: speciation in mammoths and humans
6	Feb13- Feb 17	Sexual selection, fitness, specialization,	Paper: "Double Life of Women" biological sex and humans
7	Feb20- Feb 24	President's Day Monday, no lecture. Altruism, reciprocity, relatedness	No labs, except Friday review
8	Feb27- Mar 3	Interactions between species, mutualism, MIDTERM ON FRIDAY 10am, 1h	Review for midterm Mon, Wed. No lab Friday
9	Mar 6- Mar 10	Genes and chromosome mutations, gene expression	Phylogenetic trees, fossils
10	Mar13- Mar 17	Spring Recess, No lectures	No labs
11	Mar20- Mar 24	Development, Hox genes, plasticity	Development of chicken embryo, microscope slides
12	Mar27- Mar31	Phylogenetics, phylogenetic trees, homology	Dinosaur Halls Worksheet, NHM
13	Apr3- Apr7	History of life: Extinctions, Mass Extinctions, Precambrian, Paleozoic	Mammal Halls Worksheet, NHM
14	Apr10- Apr14	Mesozoic, "age of reptiles", dinosaurs, origin of mammals	Student Presentations, Q&A
15	Apr17- Apr21	Cenozoic, mammalian evolution,	Student Presentations, Q&A
16	Apr24- Apr28	Human evolution, <i>Ardipithecus</i> , <i>Australopithecus</i> , Neanderthals	Video, final exam review
	May 8	Final Exam 9am, 1h	

Course Policies

- 1) Exam dates are firm. There are no makeup exams in the course. Performance on the final may be prorated to substitute for a missing midterm exam, if an excuse considered valid by faculty is presented in a timely fashion. An acceptable written excuse or documentation must be provided to the Instructor.
- 2) The midterm exam will be graded online by the professor and discussed during lectures. The final examination will not be returned but will be retained for one semester by the faculty.
- 3) Regrades: If you think an answer you have provided was graded incorrectly or if there is an arithmetic error, you may seek a regrade. You must provide a written explanation of why you think your answer was graded incorrectly. If a regrade is agreed upon, then the ENTIRE EXAMINATION may be subject to a regrade. Your grade may therefore go up, go down, or remain the same. Regrade requests must be received within one week of when the midterm exam is returned to the students, or by the second week of classes the following semester for the final exam.
- 4) No special assignments for extra credit are permitted.
- 5) Academic integrity policies of the University will be strictly followed (see below). Infractions can result in severe penalties. There may be assigned seating for exams. No student may be admitted to an exam after the first student has left the exam.
- 6) It may be necessary to make adjustments to the syllabus during the semester. Check the course website or class announcements on Blackboard for updates.

Academic Conduct

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Support Systems:

Student Counseling Services (SCS) – (213) 740-7711 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

engemannshc.usc.edu/counseling

National Suicide Prevention Lifeline – 1 (800) 273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) – (213) 740-4900 – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. engemannshc.usc.edu/rsvp

Sexual Assault Resource Center

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: sarc.usc.edu

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086

Works with faculty, staff, visitors, applicants, and students around issues of protected class. equity.usc.edu

Bias Assessment Response and Support

Incidents of bias, and hate crimes need to be reported allowing for appropriate investigation and response. studentaffairs.usc.edu/bias-assessment-response-support

Office of Student Accessibility Services (OSAS)

Provides certification for students with disabilities and helps arrange relevant accommodations. <https://osas.usc.edu/about/contact-location-hours/>

Student Support and Advocacy – (213) 821-4710

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. studentaffairs.usc.edu/ssa

Diversity at USC

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. diversity.usc.edu

USC Emergency Information

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible. emergency.usc.edu

USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or report a crime. Provides overall safety to USC community. dps.usc.edu