Syllabus

Evolution (BIOL 3321)

Fall 2025

The University of Texas at El Paso
Department of Biological Sciences

Course and Instructor Information

CRN:	10330
Delivery method:	In-person
Meeting day and time:	Tuesdays/Thursdays 3:00-4:20pm
Location	UGLC 346
Online material:	Blackboard course page
Instructor:	Dr. Mike Harvey, Assistant Professor
Written Communication:	Email (mgharvey@utep.edu), response within 24h M—F
Office location:	Biology 304
Office hours:	By appointment, in my office or on Zoom (email me first to arrange Zoom office hours). There is also time during class periods for questions.

Course Description

The idea of evolution is foundational to modern biology. Without it, we cannot understand where the diversity of life came from, why the bodies of humans and other organisms look and function the way they do, how cancerous tumors grow, why viruses change from host to host, how our food is processed in our guts, and the list goes on. Moreover, evolutionary principles are increasingly applied to understand change in other contexts, from human language and culture to economies and markets, from engineering design and optimization to computer algorithms and artificial intelligence. A deep understanding of how evolution works can be a superpower in a world of change.

This class is designed to give you that deep understanding. The format of this class may be a bit different from what you are familiar with. In a modern world with AI at our fingertips, information is cheap. What is more critical is context and ideas. The goal of this course is to not just teach you information, but to curate those ideas that are most important and to deliver them in ways that will seep deep into your consciousness. This will require some flexibility over the course of the semester, as learning progresses and we see what works and what doesn't. Most likely, this course will be delivered as a hybrid flipped/traditional class. Some classes will be either lectures with a powerpoint or the instructor just talking at you. Other classes may require you to learn material beforehand, so that in class we can work through problems, discuss contentious ideas, or complete group activities.

Prerequisites: BIOL 3320 (Genetics) with a minimum grade of C (may not be taken concurrently)

Student Learning Objectives

After finishing this class, you should be able to:

- Define biological evolution and discuss the rise of modern evolutionary biology
- Apply genetics to evolutionary biology
- Know what conditions are required for natural selection to operate

- Understand how natural selection works, including the events at the molecular level and how they are modeled
- Know how natural and sexual selection relate to each other
- Apply quantitative genetics to evolutionary biology
- Define adaptations, know how they evolve, and understand the level at which selection is operating
- Know how phylogenies are estimated and how to interpret them, as well as some of the various applications they have in different fields
- Understand the history of species concepts, why they are important, and the mechanistic process of speciation
- Have some ideas about how evolutionary ideas are and might be applied to other fields

Materials and Technology

Textbook: Freeman, Scott, and Jon C. Herron. 2014. Evolutionary Analysis. 5th Edition. Pearson Prentice Hall, NJ. (offered as both a print and a digital book through bookstore)

Hardware: A computer, tablet, or smartphone with internet connection is required for accessing online materials for the course both in and out of class. If you do not have any of this equipment, loans or access are available from UTEP Technology Support (https://www.utep.edu/technologysupport/).

Software: Blackboard and iClicker (https://www.iclicker.com/) applications (both free for UTEP students). Other free websites/applications may be used during the course. Assistance with obtaining and installing these is available from UTEP Technology Support.

Grading and Assignments

Individual quizzes:	10% (64 points, 8 per quiz)
iClicker participation (drop four):	10% (64 points)
Presentation	10% (64 points)
Exams	70% (448 points, 112 each)
Total:	**100% (640 points)**

Quizzes: There will be a quiz for each major topic in the course (8 total). They will be based on the textbook reading and will be administered in Blackboard. Technically they are open-book, but the time limit will make it hard to complete a quiz if you don't know the material and need to refer back to the handout or the internet. Questions will primarily be in multiple-choice format, similar or identical to the multiple-choice questions that will appear on the exams. The quizzes are to motivate you to read through and understand the background material, so be sure to complete the quizzes before the beginning of the appropriate class!

Attendance/iClicker questions: Most class days there will be at least one iClicker question or poll (and sometimes more). Some iClicker (polls) are just graded on participation, others require that you answer correctly. I will tell you which it is when I post each question. **iClicker questions are how we take attendance in this class.** I will drop four iClicker class sessions that either you missed or, if you didn't miss that many, that you missed the most points on.

Presentation: You will be assigned one scientific article on evolution to read during the semester. Then, as part of a group of ~4 students, you will present that paper to the whole class. You should have a ~5 minute summary of the paper prepared. You do not need to make a powerpoint, I will pull up the paper on the screen so you can show figures, etc. to the class. Make sure you start reading the paper early so you understand it (I will ask you questions about it!). The presentation dates for each group are listed in the Course Schedule below under Assessments Due (G1 = Group 1, etc.). Be prepared on your day!

Exams: You will have four exams (112 points each) for the course. All exams are semi-cumulative, which means they will focus on material since the last exam but may contain a few questions on or incorporating ideas from earlier in the course. Exams will be mostly multiple choice, but with one essay question testing your deeper evolutionary thinking. **Exams will be taken in class using the Lockdown browser.** You will need a computer or tablet in class for the exams (see schedule). The first three exams are during regular class times, the final exam is at a different time (during the appointed final exam slot for our class), but still in the normal classroom.

Extra credit: There will be no opportunities for individual extra credit or extra credit on request.

I will try to post grades within one week of each assessment's due date. Grades are assigned according to a standard scale:

90 – 100+: A 80 – 89: B 70 – 79: C 60 – 69: D 0 – 59: F

Communication

1. **Deadlines (for e.g., quizzes and the paper presentations) are posted on Blackboard** under each assignment. It is your responsibility to keep track of these. The exam dates are listed on the syllabus (also posted on Blackboard). Make sure to add these to your calendar!
2. **Questions:** First, ask questions to your peers. If they don't have the answer, try to ask your questions during class periods. Our class format is such that there are often opportunities to raise your hand and ask about either material or logistics (other students probably have the same question!). If that doesn't work, the best way to contact me directly is via email. If necessary, we can then arrange a one-on-one meeting/office hours.

Participation and Attendance

When you are working on materials for this class, come ready to learn. Eliminate distractions, arrive on time (for in-person classes/exams), and plan to focus on the material. This goes without saying, but be courteous to other students and the instructor, all of whom are dealing with their own challenges. Complete all work before the deadlines if you would like to receive credit.

Class absences: You are allowed to miss up to two weeks of class (four non-exam class sessions). I will automatically drop four iClicker sessions. **Do not email me to tell me about an absence, just don't come to class**. Class sessions will be recorded and posted on Blackboard so that you don't miss out on material.

Missed exams: You are not allowed to miss exams. If you require a makeup exam for one of the exams, you must have an excused absence due to medical issues or a religious observance. Written documentation of the excused absence must be provided within 2 days of the missed exam. A makeup of the final exam must be within 24 hours. Makeup exams will only be offered once to all students requiring a makeup.

Academic Integrity and AI

Presenting work that you did not do as if it's your own is strictly prohibited in this course. That said, the use of diverse resources as learning tools is encouraged. **You may use generative AI for all parts of this course except on exams and while giving your presentation**. For more information on UTEP's policies, see the *Academic integrity statement* in the last section below.

Tentative Schedule

Date	Class Session	Assessments Due	Reading Due
26-Aug	Syllabus & Introduction to Evolution		
28-Aug	Genetic Variation & Evolutionary Change		Chapter 2 (37-55)
2-Sep	GV & EC cont'd; Hardy-Weinberg Principle		Chapter 5 (147-174)
4-Sep	Hardy-Weinberg Principle, Genetic Drift	Quiz 1	Chapter 6 (179-201)
9-Sep	Migration, Genetic Drift	G1	Chapter 7 (233-259)
11-Sep	Genetic Drift & Molecular Evolution – Non-random Mating	Quiz 2, G2	Chapter 7 (260-284)
16-Sep	Wrap-up and Review		
18-Sep	EXAM 1	EXAM 1	
23-Sep	Linkage Disequilibrium & Evolution of Sex	G3	Chapter 8 (292-307; 314-325)
25-Sep	Natural Selection	G4	Chapter 3 (73-97)
30-Sep	Natural Selection; Quantitative Traits and Selection	Quiz 3, G5	Chapter 9 (329-334; 343-364)
2-Oct	Sexual selection	G6	Chapter 11 (407-447)
7-Oct	Adaptation Testing	Quiz 4, G7	Ch. 10 (369-378); Ch. 13 (491-495, 513-522)
9-Oct	Wrap-up and Review		
14-Oct	EXAM 2	EXAM 2	
16-Oct	Evolutionary Trees & Tree thinking	G8	Chapter 4 (111-128; 134-140)
21-Oct	Evolution & Human-pathogen interaction	G9	Chapter 14 (535-552)
23-Oct	Mechanisms of Speciation	Quiz 5, G10	Chapter 16 (609-614; 616-620)
28-Oct	Mechanisms of Speciation	G11	Chapter 16 (621-640)
30-Oct	Genome Evolution	Quiz 6, G12	Chapter 15 (581-585; 591-606)
31-Oct	**Drop deadline**		
4-Nov	Wrap-up and Review		
6-Nov	EXAM 3	EXAM 3	
11-Nov	The Origins of Life	Quiz 7, G13	Chapter 17 (645-683)
13-Nov	The Origins of Life	G14	Chapter 17 (645-683)
18-Nov	Evolution and the Fossil Record	Quiz 8, G15	Chapter 18 (692-730)
20-Nov	Human Evolution	G16	Chapter 20 (769-802)
25-Nov	Human Evolution (remote class)		Chapter 20 (769-802)

Date	Class Session	Assessments Due	Reading Due
27-Nov	**THANKSGIVING BREAK – NO CLASS**		
2-Dec	Evolution in the Future	G17	
4-Dec	Wrap-up and Review		
11-Dec	EXAM 4 (4-5:20pm)	EXAM 4	

University Resources and Policies

Academic resources:
Technology Support Help Desk (https://www.utep.edu/technologysupport/)
Miner Learning Center (https://www.utep.edu/mlc/)
University Writing Center (https://www.utep.edu/uwc/)
UTEP Library (https://www.utep.edu/library/)
Center for Instructional Design (https://www.utep.edu/extendeduniversity/cid/student-resources/blackboard-orientation.html) - help with Blackboard issues
Military Student Success Center (https://www.utep.edu/student-affairs/mssc/)
Counseling and Psychological Services (https://www.utep.edu/student-affairs/counsel/)

Center for Accommodations and Support Services (CASS) statement: If you have a disability and require accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to cass@utep.edu, or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at www.sa.utep.edu/cass. Requested accommodations must be made 3 working days before an examination. All students requesting disability accommodations must request a meeting with the professor to discuss the details before they will be implemented, preferably at the beginning of the semester.

Academic integrity statement: Any student who commits an act of academic dishonesty is subject to discipline. Academic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are not attributable directly to the student, taking an examination for another person, and any act designed to give unfair advantage to a student or the attempt to commit such acts. The complete UTEP policy on academic integrity and scholastic dishonesty can be found at: https://www.utep.edu/student-affairs/osccr/student-conduct/academic-integrity.html.

Statement of COVID-19 and other communicable illness: Please stay home if you have been diagnosed with COVID-19 or other highly communicable illness or are experiencing symptoms. If you are feeling unwell, please let me know as soon as possible, so that we can work on appropriate accommodations.

Course withdrawal and incomplete grades: It is the student's responsibility to drop a course by the drop deadline by contacting the Registrar's Office (https://www.utep.edu/student-affairs/registrar/students/registration.html). Incomplete grades are reserved for exceptional circumstances.