

THE UNIVERSITY OF TEXAS AT EL PASO
COLLEGE OF SCIENCE
Department of Biological Sciences

Course #: BIOL 1107 CRN#15730
Course Title: Evolutionary Genetics
Credit Hrs: 1
Term: Fall 2021
Course Meetings & Location: Biology B108, Wednesdays 11:30 AM – 2:20 PM
Prerequisite Courses: Instructor Approval
Instructor: Eli Greenbaum, Ph.D.
Office Location: Biology 301 (between Classroom & Biosciences Buildings)
Contact Info: Phone # 747-5553; Fax # 747-5808
E-mail address: egreenbaum2@utep.edu
NOTE: **please do NOT email me on Blackboard**
Emergency Contact: (Cell) 785-393-3583 *emergencies only please*
Office Hrs: Tuesdays 12:30-3:30 PM, email for other appointment times
Textbook(s), Materials: Required: Student Lab Notebook (one per group), available from Amazon for \$25 at:
http://www.amazon.com/gp/product/1930882742?ref=cm_sw_r_of_her_aws_WzbNwbQS59RNV
Lab Coat & safety goggles: available online and the UTEP Bookstore

Course Objectives (Learning Outcomes):

- (1) basic concepts of genetics, including the molecular structure of DNA, gene structure and function, polymerase chain reaction, and genomics
- (2) phylogenetic trees, including basic models of molecular evolution, optimality criteria (i.e., parsimony, likelihood, Bayesian inference), and bootstrap/posterior probability support values
- (3) systematics, including cryptic species, taxonomic priority and nomenclature rules, and examples of taxonomic revisions based on phylogenetic trees from the primary literature
- (4) conservation biology, including the biodiversity crisis, global amphibian declines, deforestation, human population growth, global climate change, and threat assessment criteria from IUCN
- (5) laboratory techniques for DNA isolation, cold-vac concentration of samples with low DNA yields, PCR, DNA purification, and observation of DNA sequencing in the BBRC Genomic Core facility
- (6) analysis of Sanger DNA datasets with the online databases GenBank and BLAST, and computer programs

Course Activities/Assignments: Students will be expected to give two 10 minute Powerpoint presentations related to: (1) the genus/family of amphibian or reptile they are working on for their semester-long project (midway through semester); and (2) an analysis of a phylogenetic tree, which will be based on their cumulative laboratory work over the course of the semester (at end of semester). Students will be expected to keep an organized laboratory notebook during laboratory activities to ensure that their methods and data are documented well. **Data generated in the lab will be used for publishable research, and thus lab book documentation is especially important.** Contamination of samples must be avoided. Time constraints might not allow for all scheduled topics to be covered during classtime, and in these cases, students are still responsible for material that is posted in Powerpoints on Blackboard. Due to time constraints, some topics may not be covered.

Assessment of Course Objectives: Students will be assessed on the course objectives from three quizzes, two Powerpoint presentations (a rubric for grading will be provided), organization and clarity of the lab notebook, effectiveness of laboratory procedures (i.e., valid results with no contamination), and attendance/punctuality.

- Grading Policy: Each quiz is worth 15% of the final grade and will include multiple choice questions. Quizzes will: (1) include two or three bonus questions such that it will be possible to receive a grade of 103%; (2) not be cumulative; and (3) not be curved. Failure to bring an undamaged, unfolded green SCANTRON to class on the day of quizzes will result in a penalty of 5 points to the grade. The two Powerpoint presentations will be worth 15% of the final grade each. Ten percent of the final grade will be determined from laboratory notebook organization and clarity. The final fifteen percent will be determined from validity of laboratory results (i.e., lack of contamination) and class attendance/punctuality. Final grades for the course will be as follows: 90–103: A; 80–89: B; 70–79: C; 60–69: D; < 60: F. **Please note that I can discuss grades via email only when students contact me with their official UTEP email address.**
- Make-up Policy: Makeups for missed quizzes will be offered to students because of illness, vehicle breakdown, death in the family, or university-sponsored activity, **but written documentation must be provided within 1 week of the missed quiz via email to the professor.** Makeups are not an option for poor grades on quizzes or Powerpoints, time conflicts with work or other classes, or missed classes due to family obligations. **Approved makeup assignments will consist of a 2-page research paper for quizzes. General guidelines, a grading rubric, and an example of these papers are provided on Blackboard; contact the professor for additional details.**
- Extra Credit: Note that with the exception of bonus questions on exams, no extra credit will be given for any assignment at any time during the entire duration of this course. Requests for extra credit assignments will be denied—no exceptions.
- Attendance Policy: **Attendance and punctuality are a significant portion of your grade in this course.** Valid excuses for tardiness/missing class include illness, vehicle breakdown, death in the family, or university-sponsored activity, but **all valid excuses must be accompanied by written documentation** to receive credit. Students who miss quizzes without written documentation will receive a grade of zero. I will monitor attendance/punctuality on a regular basis throughout the semester. Depending on the laboratory assignment, some classes may end early.
- Assigned Videos: Occasionally I might assign videos for you to watch from websites including CBS News, BBC News, Youtube, New York Times and other sites with stories relevant to class. If videos don't load for you on the first attempt, it is the student's responsibility to try different web browsers to view the videos. I will monitor these websites prior to class, but if for any reason the website is not working, it is the student's responsibility to bring this to my attention at least 2 days before a given quiz so that I can omit any questions that are related to these videos.
- Honors Credit: Honors Credit is not available for this course.
- Academic Integrity Policy: **Sharing of calculators or use of calculator features of cell phones during quizzes will not be permitted.** The UTEP policy on academic honesty can be found at: <https://www.utep.edu/student-affairs/osccr/student-conduct/academic-integrity.html>. All students will be expected to adhere to this policy.
- Civility Statement: I expect all students to be actively engaged in taking notes and class activities during the brief time we meet each week. This means that students should not: (1) converse with classmates during lectures; (2) use cell phones during class (including texting); (3) use laptop computers for any purpose other than note taking; or (4) otherwise disrupt your fellow students from learning and active participation.
- Disability Statement: If you have a disability and need classroom 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 <https://www.utep.edu/student-affairs/cass/>. Requested accommodations must be made 5 working days before a quiz. All students requesting disability accommodations must request a meeting with me before they can be implemented.
- Military Statement: If you are a military student with the potential of being called to military service and/or training during the course of the semester, please contact me within the first two weeks of class to arrange in advance for makeup quizzes, etc.

Dropping the Course: Students are cautioned to consider dropping the course if they are performing poorly **BEFORE** the drop deadline (see below for date). You must drop this class yourself – I will not automatically drop you if you just stop attending. However, I reserve the right to drop you if you register for the course and never show up to class. Also remember that courses may only be repeated a total of 3 times, and a “W” counts as one. The College of Science will remain aligned with the University and not approve any drop requests after the drop date. Note that despite what the registrar’s office might tell you, I am not allowed to drop you after the drop deadline per department policy.

Incomplete Grades: All grades of Incomplete must be accompanied by an Incomplete Contract that has been signed by the instructor of record, student, departmental chair, and the dean. Although UTEP will allow a maximum of one year to complete this contract, the College of Science requests it be limited to one month based upon completion data. A grade of Incomplete is only used in extraordinary circumstances confined to a limited event such as a missed exam, project, or lab. If the student has missed a significant amount of work (e.g. multiple assignments or tasks), a grade of Incomplete is not appropriate or warranted.

COVID-19 Precautions: **Please stay home if you have been diagnosed with COVID-19 or are experiencing COVID-19 symptoms.** If you are feeling unwell, please let me know as soon as possible, so that we can work on appropriate accommodations. If you have tested positive for COVID-19, you are encouraged to report your results to covidaction@utep.edu, so that the Dean of Students Office can provide you with support and help with communication with your professors. The Student Health Center is equipped to provide COVID 19 testing.

The Center for Disease Control and Prevention recommends that people in areas of substantial or high COVID-19 transmission wear face masks when indoors in groups of people. The best way that Miners can take care of Miners is to get the vaccine. If you still need the vaccine, it is widely available in the El Paso area, and will be available at no charge on campus during the first week of classes. For more information about the current rates, testing, and vaccinations, please visit epstrong.org

Course Schedule:

<u>Lecture Schedule</u>	<u>Topic/Exam</u>
W Sep 1	Objectives & Congo Lecture
W Sep 8	DNA: basic genetic material/Lab: DNA Extraction
W Sep 15	DNA Replication/Lab: PCR
W Sep 22	PCR/Lab: Check Gels & DNA Purification
W Sep 29	QUIZ 1 /Lab: DNA extraction from more samples
W Oct 6	Gene Function & Structure/Lab: PCR for more samples
W Oct 13	Genomics & Sequencing /Lab: Check Gels, Purification
W Oct 20	Mutation/Lab: DNA extraction from more samples
W Oct 27	QUIZ 2 / PCR for more samples
F Oct 29	**** DROP DEADLINE *****
W Nov 3	Student Powerpoint Presentations/ Lab: Check Gels, Purification
W Nov 10	Evolutionary Genetics/ Lab: finalize analyses for presentation
W Nov 17	Systematics and Taxonomy/ Lab: Final Student Presentations
W Nov 24	Biodiversity Crisis / Early recess for Thanksgiving
W Dec 1	QUIZ 3