

Syllabus BIOL 3338 – BIOLOGICAL EVOLUTION

Professor:

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Course Meeting Time: MWF 10:10-11:05 am, Soules 103

Office Hours: MWF, 2-3 pm

Comments about emails. Emails sent during normal business hours (e.g., 9am to 5pm) can expect a reply that day. Emails sent in the evening or early morning (e.g., 1am) most likely will not receive a reply until the following day. Emails sent over the weekend (Friday evening until Sunday evening) or on holidays also most likely will not be answered until the next business day. Nevertheless, I periodically check my email outside of business hours and will reply, when possible, to emergencies. So, if you have an emergency, send the email so that I have record of it and I will respond when I can.

COURSE DESCRIPTION: This course provides an overview of the mechanisms and processes of evolutionary change at the population, organismal, cellular, and molecular levels. It also provides an overview of the history of Earth and its biota including geological time, fossils, and man. Prerequisites: BIOL 1306/1106, BIOL 1307/1107 and BIOL 3332 (Genetics).

STUDENT LEARNING OBJECTIVES: Upon completion of BIOL 3338, the student should be able to

- define biological evolution and discuss the rise of modern evolutionary biology
- apply genetics to evolutionary biology
- identify evidence for evolution
- know what conditions are required for natural selection to operate and other mechanisms of evolutionary change
- distinguish between directional, stabilizing, and disruptive forms of selection
- define adaptation, how they evolve, and understand at what level selection is operating
- differentiate among species concepts and understand the mechanistic hypotheses for speciation
- understand the basics of molecular evolution
- understand phylogenies
- understand mechanisms of speciation
- understand the evolutionary history of humans

Required Texts:

1. Bergstrom, Carl T. and Lee A. Dugatkin. 2023. *Evolution*. Norton.
<https://wnorton.com/books/9781324033714>

2. Dawkins R (1976). *The Selfish Gene*. Oxford University Press. (Any edition will work, the library has this as ebook).

Additional required readings from the primary literature may be announced from time to time.

Evaluation: Grades will be assigned based on the performance on four exams. Each of the four exams will be worth 25% of the final grade. The final exam will be optional and will replace the lowest regular exam grade. The final exam will be cumulative. Material for the exams will come from the lecture, videos and guest lectures and the required text. More details may be announced in class.

Evaluation Summary:

1. Four exams (each will be worth 100 points, 400 points total)
2. *The Selfish Gene* quiz, taken at the end of the semester (50 points)
3. Attendance (100 points)

Optional Final Exam (will replace your lowest exam)

Final grades in the course will be determined by a standard grading system

90 – 100% = A 80 – 89% = B 70 – 79% = C 60 – 69% = D < 59% = F

Rounding: Grades will be rounded to the nearest whole number. Therefore, a 79.1 would be rounded down to a 79 (a 'C') and a 79.6 would be rounded up to an 80 (a 'B') and so on. This also means that grades in the middle of a bin, e.g., a 77 or an 87 will not be rounded to an 80 or 90, respectively.

Exams. Each student will have an entire class period take the exam. Pay attention to all announcements in class on Canvas. See policy on missed exams and assignments below. Although exams will stress the material preceding each exam, all exams should be considered comprehensive (as is all biology). Exams will cover the materials presented in lectures and assigned readings. Exams may contain a mix of multiple choice, definitions and essay/short answer questions. If you arrive late to class and everyone has completed the quiz or exam, you will not get a makeup quiz or exam. If you arrive late and someone has taken the quiz (or exam) and left the room, you will not get a quiz or exam. Arrive to class on time. **Realize that questions of written exams are not 'open ended questions' or opinion-based. The questions I ask you will have definite, correct answers and will not involve your opinions unless I explicitly ask you for your opinions.** Also realize that if you write a very long answer but do not answer the question and/or provide factually incorrect statements, you may earn 0 points for that question. While you may earn partial credit, depending on the completeness of your answers, do not expect to receive points for effort. If you do not answer the question, you will receive zero points. Students must answer the questions clearly using complete sentences, not bullets or phrases. This is not meant to torture students, but the ability to communicate effectively and remember content across courses are very important skills. Thus the clarity of

written answer will be a factor in grading. Except for invited speakers during the UT Tyler Darwin Day celebration, **I do not give extra credit.**

Grading Issues. In grading, I strive for fairness and consistency. If you feel like a grading error was made on an exam, you may submit a typed appeal within a week (7 days) of when the exam was returned to you. Your written appeal should be based on course materials and should stress the scientific validity of your original response.

Regrading issues. While I am happy to discuss exams and course content during office hours or other meetings, I will not verbally discuss grades or points on exams to students. Exams will be returned and keys will be posted online. If you are concerned about an exam grade, the best approach will be to go over the exam questions and try to understand why you scored incorrectly on each exam question. If you believe you unfairly lost points, consider filing an appeal. If you would like further clarification why you did not receive full points, please put the request in writing. **You will have one week from the return of the exam to file an appeal or make an inquiry or make any other dispute.** Your request must be justified with content from the lecture, textbook or other scientific peer-reviewed source, i.e., not random websites. Please come to office hours or schedule an appointment, and come with questions. The single exception to this policy would be errors in addition, for example, if I incorrectly tally up your points. If there is a math issue, you may contact me personally or send me an email. **In summary, I am happy to discuss topics or exam questions and answers, I will not discuss grades or points or address disputes in person. Grade and point issues must be addressed in written format.**

No Grade Grubbing. Grade grubbing is asking for points you did not earn. It's unethical to ask and would be unethical for me to award points. Also, within the category of grade grubbing is asking for exams or quizzes to be regraded outside the window where you are allowed to do so. Grade grubbing is not asking about your grades or trying to understand where you went wrong.

The Selfish Gene. You are required to read this text. My recommendation would be to read this book early in the semester, take notes and think about it as we visit the main parts of evolutionary biology throughout the semester. The Selfish Gene should help you think about the genetic basis of evolution early in the semester and more macroevolutionary topics later on. There will be an online, take home quiz about this book toward the end of the semester. You will need to have read this book to perform well on the quiz. Do not rely on a AI summary or anything other than the original text.

Do not cheat or plagiarize, even on extra credit assignments. **If you cheat or plagiarize, you will at a minimum receive a 0 on that assignment and be reported to the university authorities.** Realize that any issue with academic misconduct can severely impact, if not inhibit, your chances of obtaining a career associated with public trust (police officer, lawyer, doctor, dentist, nurse, etc.). Don't cheat or plagiarize. Just don't do it. Don't be tempted to look up/copying and pasting sentences or paragraphs while taking an exam. Just don't. For definition

and explanation of cheating or plagiarism see section on “**Student Standards of Academic Conduct**” toward the end of this document.

Comment about plagiarism and definitions: Reciting definitions as you might see them defined in a textbook is not necessarily plagiarism. This is how we learn should learn words – we should learn the words and then a technical definition, which may be close if not nearly identical to what you might find in a dictionary, glossary or textbook. This is especially true in a closed book exam. For example, if evolution is defined as ‘genetic changes over time’ there are only so many ways this could be rewritten in an original manner and still retain its technical meaning. Therefore, I would not consider it to be plagiarism if you remember definitions of words as they are presented in the textbook or lecture, but if you stray from these definitions you may lose meaning. Much of scientific writing is not meant to entertain or be creative rather it is meant to convey understanding and meaning.

Attendance. Attendance is mandatory and will be taken in class. If you sign in for a friend (or friends), all of you will be counted as absent.

Missed Exam and Assignment policy: It is your responsibility to take the exam on time. Failing to take a scheduled examination will result in a score of 0 unless replaced by a make-up exam in a timely fashion. ‘Make-up’ examinations are given only in cases where there is a documented excuse beyond your reasonable control:

- Illness – you must have a physician note indicating that you were not in a physical condition to take the exam at the scheduled time. A note from a family member is insufficient.
- Death or grave illness in your immediate family.
- Significant scheduling conflicts (e.g., med-school interviews, or other university sponsored events). You must notify the instructor at least 2 weeks in advance of this absence.

The nature of the make-up exam will be decided by the instructor and may consist of a written and/or oral examination.

SUPPLEMENTS: Illustrations, announcements and some PowerPoint presentations will be available on Canvas. **Please note that my lecture slides will not be posted on Canvas.** This is to encourage you to develop excellent study habits by purchasing and reading the book and also taking advantage of the online supplements. I will post on Canvas material presented in class that is not in the book. Material posted on Canvas is strictly for your own use, and is not to be disseminated to anyone else, under any circumstances. Lectures will be supplemented by frequent videos shown during class. These will provide new information or reaffirm the information presented in lecture. **Both lectures and supplements represent testable material.** The textbook also has an excellent website with quizzes and other study aids.
<https://wnorton.com/books/9781324033714>.

Academic Integrity: Students should be aware that absolute academic integrity is expected of every student, in all courses taken at The University of Texas at Tyler. Failure to comply can result in strong university-imposed penalties. For instance, submitting plagiarized work to meet

academic requirements including the representation of another's work or ideas as one's own; the unacknowledged word-for-word research results shall be grounds for charges of academic misconduct. Penalties for cheating or other types of academic misconduct include anything from a zero on the exam or quiz during which the cheating occurred or an F for the course.

Exams

- **TAKEN INDIVIDUALLY**, without input or assistance from anyone else, including students that have taken the exam, quiz, or course previously.
- The use of notes, texts, or any other reference material is **PROHIBITED**.
- Possession of anything containing course content will be considered cheating, whether or not you actually refer to them or not during the exam
- **TALKING** during an exam to anyone other than the instructor or proctor will automatically be considered cheating. It does not matter what you were talking about.
- Any use of a cell phone or any other electronic device that could be used to record or transmit test material is **PROHIBITED**. Phones must be out of sight and silenced during the exam. Do not let people call you.
- Hats worn during exams must be turned around or removed so the face is not covered in any way.

Lab Reports or Writing Assignments

- Students may **NOT** plagiarize any part of the lab report, it must be written individually.
- Methods may be similar since the same labs will be conducted; however, they may not be identical, since everyone writes a bit differently.
- Results may have similar data to your group members; **HOWEVER**, you should prepare your own tables and figures and create your own titles.
- You will submit this to a plagiarism checker via Canvas (unicheck), which will check for all forms of plagiarism. Your similarity report should be less than 40%, if it is not, you better double-check your work!
- All submissions should be in a Word document.

WHAT IS PLAGIARISM AND HOW CAN IT BE AVOIDED?

Plagiarism may be defined as (1) presenting work, ideas, or phrasing of another, in whole or part, as one's own without giving credit and proper documentation of sources; (2) copying material directly from sources (including electronic media) except when the material is enclosed in quotation marks and the source is clearly identified; (3) paraphrasing too closely to the original, even when the source is identified; and (4) claiming credit for work in any media (electronic, digital, artistic, etc.) where the student is not the original creator of said work. Work that is plagiarized will receive an automatic grade of "F". If you are unsure about this subject, please take the time to talk to your instructor and /or read this:

<https://www.ox.ac.uk/students/academic/guidance/skills/plagiarism>

Use of an AI Generator such as ChatGPT, iA Writer, MidJourney, DALL-E, etc. is **explicitly prohibited** unless otherwise noted by the instructor. The information derived from these tools is based on previously published materials. Therefore, using these tools without proper citation constitutes plagiarism. Additionally, be aware that the information derived from these tools is often inaccurate or incomplete. **It is imperative that all work submitted should be your own.** Any assignment that is found to have been plagiarized or to have used unauthorized AI tools may receive a zero and/or be reported for academic misconduct.

Some definitions:

- (i) “Cheating” includes, but is not limited to:
- copying from another student’s test paper;
 - using, during a test, materials not authorized by the person giving the test;
 - failure to comply with instructions given by the person administering the test;
 - possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed “crib notes”. The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
 - using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
 - collaborating with or seeking aid from another student during a test or other assignment without authority;
 - discussing the contents of an examination with another student who will take the examination;
 - divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
 - substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
 - paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
 - falsifying research data, laboratory reports, and/or other academic work offered for credit;
 - taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and

- misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.

(ii) “Collusion” includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.

(iii) All written work that is submitted will be subject to review by Unicheck™, available on Canvas.

Recording of Class Sessions

Class sessions may be recorded by the instructor for use by students enrolled in this course. Recordings that contain personally identifiable information or other information subject to FERPA shall not be shared with individuals not enrolled in this course unless appropriate consent is obtained from all relevant students. Class recordings are reserved only for the use of students enrolled in the course and only for educational purposes. Course recordings should not be shared outside of the course in any form without express permission.

Artificial Intelligence Statement

For this course, **AI is not permitted in this course at all.** I expect all work students submit for this course to be their own. I have carefully designed all assignments and class activities to support your learning. Doing your own work, without human or artificial intelligence assistance, is best for your efforts in mastering course learning objectives. For this course, I expressly forbid using ChatGPT or any other artificial intelligence (AI) tools for any stages of the work process, including brainstorming. Deviations from these guidelines will be considered a violation of UT Tyler’s Honor Code and academic honesty values.

TENTATIVE CLASS SCHEDULE

(Changes will be announced in class)

Lecture Topics (Chapters)

Introduction (1)
Evidence of Evolution (2)
Natural Selection (3)
Population Structure/Genetic Drift (8)

Feb 5 – Exam 1

Evolution of Sex (16)
Evolutionary Medicine (20)
Evolutionary Genetics/Genomics (6,10)

March 5 – Exam 2

Molecular Evolution Ch. 8, 5(287-304)
Phylogenetics (4,5)
Speciation (14)
Extinction (15)

April 4 – Exam 3

History of Life on Earth (11, 12)
Human Evolution (19)

April 25 – Exam 4

Final Exam TBA (April 28-May 2)

Important Dates:

January 20: Martin Luther King, Jr Day (No Class)
January 27: Census Date
March 31: Withdrawal Date
March 17-21: Spring Break (No Class)
April 25: Last Day of Classes
April 28-May 2, Final Exam Week)