

BIO 370
EVOLUTION – Summer 2020
June 3, 2020

“Lecture” Times

Unique # 84395 M-F 11:00 AM – 12:30 PM
Unique # 84400 TTh 11:00 AM – 12:30 PM

“Discussion” Times

Unique # 84395 M-F 11:00 AM – 12:30 PM
Unique # 84400 TTh 11:00 AM – 12:30 PM

Instructor: Dr. Edward Theriot, Department of Integrative Biology

TA: Mr. Kum (Will) Shim, Department of Integrative Biology

OFFICE HOURS: VIRTUAL OFFICE HOURS WILL BE HELD DURING THE POSTED LECTURE AND DISCUSSION TIMES USING ZOOM THROUGH CANVAS. Dr. Theriot and Mr. Shim will also do their best to be available to you by appointment. Dr. Theriot, in particular, is a night owl and is often available in the evening.

The course is asynchronously taught. That means that you need to be self-directed. There are no regular lectures or discussion sections. See below for general details. Nitty-gritty details are posted on Canvas under Files>BasicClassStuff.

ALL COMMUNICATION WITH MR. SHIM AND DR. THERIOT MUST BE VIA CANVAS EMAIL!

Textbook: *Evolution*— 2nd Edition, 2016. Bergstrom and Dugatkin, Norton & Company.
There is a digital version. I THINK it is available through the Coop. I KNOW it is available through WW Norton.

Use a 1st Edition at your own risk.

NOTA BENE: Several versions of the 2nd Edition are available: a hard binding, soft binding, and loose-leaf binding, and an e-book version. The e-book version has practice questions, etc. that you might find useful.

Homepage: We will be using Canvas (canvas.utexas.edu). Access requires you to login with your EID and Password and **you cannot login unless you are registered in the course.** All communications are VIA CANVAS EMAIL!!

Course Description:

Overarching goals are to explain the core concepts of evolutionary theory and its application in basic science, industry, technology, agriculture, and human health. An ancillary goal is to explain the nature of scientific inquiry and the importance of the PREDICTIVE power of evolutionary theory. **We will identify evolutionary theory as standing alone as a predictive tool for guiding new scientific discovery rather than an explanation for a collection of facts.**

The first half of the course is devoted to understanding the process of genetic change in populations - the evolutionary process. **The first quarter** sets forth a fundamental philosophical statement about evolution as a science, by examining what a theory is and how it is used to make predictions in a general scientific sense. We ask the question: is evolution a science because it explains or because it makes testable predictions? We then will

examine the critical processes underlying heredity. **The second quarter** examines the processes of heritable change from generation to generation by developing models of increasing complexity and applying those models to address questions relevant to both basic and applied scientific questions. It concludes with an explanation of the utility of quantitative genetics as a tool to understand evolution of the phenotype, typically controlled by multiply loci.

The second half of the course is devoted to understanding the outcomes of the evolutionary process, and how we can use the patterns generated by different mechanisms and modes of evolution to make testable predictions. **The third quarter** begins with the logic of reconstruction of the pattern of evolution, and ends with examination of the intersection between population thinking and phylogenetic thinking by addressing the question: What is a species? **The fourth quarter** of the course examines the various consequences of evolution for humans. What does evolution have to do with the price of corn? Literally in one example. We will also explore evolutionary theory for what it predicts about increasing human life span, what sort of mutations are most likely to result in cancer in pre-reproductive humans, and what sort are most likely to result in cancer in post-reproductive humans. We will answer the question: what patterns of application of pesticides or antibiotics are more likely to effect control of highly adaptive insects, or pathogens?

Course Prerequisites: The main prerequisite is an understanding of basic genetic concepts. You are required to have taken BIO 325 or its equivalent before taking this course. You should be familiar with the fundamentals of Mendelian and molecular genetics (e.g., gene inheritance; DNA coding for amino acids in proteins; etc.); it may be worth reviewing basic genetics by reading the appropriate parts of your favorite introductory biology or genetics text.

Course Format and Grading: Self-directed Powerpoint slide sets, each for one day of the 26 day session, will be posted on Canvas, along with a daily quiz that is designed to be more pedagogical and less about assessment. Each will be worth 4 points. The low daily quiz score will be dropped. There will be major quizzes for each of the main weeks of the course (5 total, low score will be dropped).

ALL quizzes are completely open resource. Open book. Open notes. Use the interweb. Consult with your peers. The ONLY cheating is to hack into Canvas for the right answer. Dr. Theriot makes no bones about it. There will be HARD questions asked. You have to read each word carefully. Take advantage of the open resources. His intent is that the weekly quizzes be equal parts pedagogy and assessment.

The four highest scored weekly quizzes are together worth 100 points each for a total of 400 points or 80% of the course total. The 25 highest daily quizzes will be worth 4 points each for a total of 100 points or 20% of your total grade.

All quizzes are on-line in Canvas. You will be notified when a quiz is posted, and you will be notified of the due date and time. You will have about 24 hours to complete a daily quiz before Canvas will close the quiz and auto-submit whatever score you have at that time. You will usually have about 48 hours to complete the weekly quiz before Canvas will close the quiz and auto-submit whatever score you have at that time.

THERE IS NO SEPARATE FINAL EXAM OR QUIZ.

The grade break-down is as follows.

	Points Possible	Percentage
Four exams (100 points per exam)	400	80%
Discussion (10 points for each)	100	20%
Total	500	100%

Letter Grade	Percentage of available	Total Points at Semester End
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	points at any one time.	
A	90+	450-500 pts
B	80-89.99	400-449.99 pts
C	70-79.99	350-399.99 pts
D	60-69.99	300-349.99 pts
F	<60	<300 pts

There are NO extra credit points.

Make-up quizzes/extensions of time for completing quizzes are only available per the rules below.

Grades will NOT be curved

Quiz grade appeals: If you believe a grading error was made on an exam, you may submit an appeal **VIA CANVAS EMAIL**

within a calendar week (7 days) of when the grade was returned to you.

Your appeal MUST be based on course materials and should stress the scientific validity of your original response.

Please keep the following in mind when it comes to requesting a re-grade:

Time and again students have included in their appeals information that was NOT in the original answer on the exam. We can only re-grade what is on the exam, NOT what was in someone's mind.

There is no LECTURE or DISCUSSION ATTENDANCE POLICY.

In fact, there are no typical lectures or discussions. Rather, the posted lecture and discussion times will be used as office hours for Dr. Theriot and Mr. Shim. They will register a Zoom invitation through Canvas for the entire class. PLEASE AVAIL YOURSELF OF THESE OPPORTUNITIES!

Excused absences for quizzes include recognized religious holidays, participation in official UT athletic events (NCAA sports such as swimming, basketball, track or baseball, and/or UT recognized club sports such as rugby or lacrosse), other official UT related/sponsored organizations. Such planned events require a one-week advanced notification to Dr. Theriot AND your assigned TA **VIA CANVAS EMAIL**. Documentation will be required.

Illness, death or serious illness of immediate family, and other serious emergencies are allowable excuses (upon consultation **VIA CANVAS EMAIL** with Dr. Theriot AND your assigned TA ASAP after the event). Documentation will be required.

Incomplete Policy: Any incomplete grade given must be verified with a written (email) agreement between Dr. Theriot and the student that specifies the work to be done and a timetable for completion **VIA CANVAS EMAIL**. In accordance with University policy, the grade of incomplete can only be awarded in cases of students whose circumstances prevent them from finishing the required work for the course.

Special Needs and Accommodations: We will do everything in our power to accommodate students with special needs as addressed in UT policies. UT's Services for Students with Disabilities (SSD) determines eligibility and helps faculty and students implement reasonable accommodations for students with disabilities at the University of Texas at Austin.

PLEASE CONSULT WITH DR. THERIOT ASAP TO DISCUSS YOUR ACCOMMODATIONS. It is not mandatory but it would be a BIG help if you could please refresh Dr. Theriot's memory **VIA CANVAS EMAIL** at least one week prior to exams, if you have exam accommodations.

SSD is housed in the Office of the Dean of Students, located on the fourth floor of the Student Services Building. Information on how to register, downloadable forms, including guidelines for documentation, accommodation request letters, and releases of information are available online. Please do not hesitate to contact SSD at (512) 471-6259, VP: 1-866-329-3986 or via e-mail if you have any questions. Also, the SSD office webpage is at <http://diversity.utexas.edu/disability/>, and has links to contact information and other details.

Academic Integrity: Scholastic dishonesty in any form will not be tolerated. Students who violate rules on scholastic honesty are subject to disciplinary penalties including the possibility of failing the course and being dismissed from the university. See http://deanofstudents.utexas.edu/sjs/scholdis_whatdis.php for additional information on scholastic dishonesty.

Confidentiality of Student Records: We strive to maintain the anonymity of individual students taking this course relative to grades given on assignments or exams, or final grades at the completion of the course.

Some Important UT Calendar Dates: (THIS IS UNOFFICIAL. I HAVE DONE MY BEST TO BE ACCURATE. PLEASE CHECK THE UT CALENDAR AT <https://registrar.utexas.edu/calendars/20summer> TO BE SURE!!)

June 4 – Class begins.

June 5 – Last day of drop/add.

June 9 – Official enrollment date. Last day to add.

July 9 – Last official day of class.

July 11 – Due date of last weekly quiz.

There is no separate final exam.

BIO 370
EVOLUTION – SUMMER 2020
SCHEDULE OF TOPICS AND WEEKLY QUIZZES

Date	Day	Topic
June 4	1	Introduction to Evolutionary Thought
June 5	2	Review of Transmission Genetics from an Evolutionary Viewpoint
June 8	3	Fundamentals of Mutation from an Evolutionary Viewpoint
June 9	4	The Hardy Weinberg Equation; Measuring Fitness
June 10	5	Fate of Alleles under Selection under Different Dominance Situations
June 11	6	Frequency Dependent Selection; Mutation and Fate of Alleles
June 12	7	Effects of Nonrandom Mating and Migration; Summary of Days 5-7
Weekly Quiz 1 due 11:59 p.m., Sunday, June 14		
June 15	8	Finite Population Size and Fundamentals of Drift
June 16	9	Drift, Selection, and the Molecular Clock
June 17	10	Measuring Linkage Disequilibrium
June 18	11	Consequences of Linkage Disequilibrium
June 19	12	Consequences of Linkage Disequilibrium
Weekly Quiz 2 due 11:59 p.m., Sunday, June 21		
June 22	13	Quantitative Genetics
June 23	14	Quantitative Genetics
June 24	15	BuildingAndReadingTrees
June 25	16	BuildingAndReadingTrees
June 26	17	BuildingAndReadingTrees
Weekly Quiz 3 due 11:59 p.m., Sunday, June 28		
June 29	18	SpeciesAndSpeciation
June 30	19	SpeciesAndSpeciation
July 1	20	SpeciesAndSpeciation
July 2	21	Evolutionary Genomics
July 3	22	Exploring Nature for beneficial stuff using evolution
Weekly Quiz 4 due 11:59 p.m., Sunday, July 5		
July 6	23	CoevolutionaryArmsRace
July 7	24	EvolutionaryMedicine
July 8	25	Viruses
July 9	26	BigC.InnerProtist
Weekly Quiz 5 due 11:59 p.m., SATURDAY, July 11		