

GENETICS (BIOL 3320) – SUMMER 2023

Instructor: Jeffrey T. Olimpo, Ph.D.

Office Hours: Scheduled by appointment (held via Zoom)*

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*In an effort to ensure that your privacy is maintained, I have elected to hold virtual office hours on an individual basis. If you would like to schedule an appointment, please e-mail me. I am here to help! ☺

COURSE DESCRIPTION

Welcome to *the study of genes, genetic variation, and heredity!* This course examines the field of Genetics with a particular emphasis on the nature and functions of hereditary material, including the experimental procedures and data that have led to our current understanding of Genetics concepts. Applications of Genetics to other areas of science (e.g., public health) will also be discussed. **Please note that this is an accelerated, 4-week course held entirely on Blackboard.**

COURSE STRUCTURE: AN OVERVIEW

Whether you have completed a course in the field or you have not been in the classroom for more than a decade, you possess the means to be successful in this class and have a wealth of experience to contribute to our discussions. This semester, our course will be conducted **in a fully asynchronous, online environment**. To assist you in achieving your biology learning goals this term, I have applied the RIPE (Review, Interact, Practice, Examine) method to each module. You may be curious what this means for you as a student. Specifically, RIPE offers a scaffolded way to approach course content, as follows:

- First, you will want to **review the tasks that you need to accomplish for each week**. In order to help you achieve this objective, I will post a “Weekly Updates” announcement to our Blackboard site that indicates which lectures you should download and view, optional and mandatory assignments that should be completed, etc. This announcement will also be distributed via e-mail, so *please be sure to regularly check your UTEP e-mail account!*
- Within Blackboard, you will have an opportunity to **interact with course content** in the form of lectures, thought questions, and activities. Weekly discussion boards also provide you with a formal space to pose questions, share ideas, and enhance your comprehension of course content.
- For several topics presented in the course, you will have an opportunity to **practice what you have learned** via completion of animation-based exercises. More information about homework for the course can be found later in this syllabus.
- Lastly, course assessments (e.g., exams) will provide a venue for you and me to **examine your understanding** of material presented in each module. Additional details about the exams, such as dates, can be found later in this syllabus.

COURSE GOALS/OBJECTIVES

This course is designed to provide students with a broad introduction to the field of Genetics. Upon completion of the course, students will be able to:

- Identify and describe the processes wherein DNA serves, ultimately, as a template for the synthesis of proteins
- Compare and contrast various patterns of Mendelian and non-Mendelian inheritance as well as apply knowledge of these patterns to both construct and evaluate pedigrees
- Understand the central theories/methods that define various Genetics subdisciplines
- Discuss and demonstrate attitudes important to the scientific community such as discerning cause-effect relationships, making evidence-based claims, and synthesizing facts from multiple sources in order to understand situations as a whole

COURSE TEXTBOOK & MATERIALS

1. *Genetics: A Conceptual Approach (7th Ed.)*; Benjamin A. Pierce.
W.H. Freeman, Publishers; ISBN-13: 9781319216801

NOTE: The textbook is **not required** for this course, and all assignments and exams will be structured around the lectures and activities delivered online. However, the textbook is a recommended resource for reviewing material that you might have found particularly challenging or need further clarification on before exams.

2. *OpenStax* Textbook: The *OpenStax* site provides both online and PDF versions of a general Introductory Biology textbook (<https://openstax.org/details/books/biology-2e>). Please note that chapters 11 - 17 are most relevant to this course.
3. While it will not necessarily be used frequently, you may wish to keep a calculator on hand.

ACADEMIC INTEGRITY

As members of a scholarly community dedicated to healthy intellectual development, students and faculty are expected to share the responsibility of maintaining high standards of honesty and integrity in their academic work. All material for this course must be your work and no one else's. **Cheating or plagiarism in any form will not be tolerated.** This includes, but is not limited to, copying someone else's work on an assignment or exam. Please note that all suspected instances of plagiarism or academic dishonesty will be referred to the Dean of Students Office, in accordance with UTEP policies and procedures.

The honor code also states that all members of the UTEP community are entrusted with the responsibility to uphold and promote five fundamental values: Honesty, Trust, Respect, Fairness, and Responsibility. These core elements foster an atmosphere, inside and outside of the classroom, which serves as a foundation and guides the UTEP community's academic, professional, and personal growth. Endorsement of these core elements by students, faculty, staff, administration, and trustees strengthens the integrity and value of our academic climate.

COMMUNICATIONS

When you e-mail me, please include a proper subject, any message you are responding to, the course name and CRN, as well as your name. Please use your UTEP account to ensure that your e-mail is not blocked by the university's spam filter. If you e-mail me directly from our Blackboard course, essential information like the course name and section will automatically be included. **Please do not use the "Messages" feature in Blackboard, as I will not actively check that area.** I will do my best to respond to your e-mail within 48 hours. If you do not receive a response from me within this timeframe, I ask that you please re-send your e-mail. Ensure that you regularly check the e-mail account listed for you in Blackboard, as this is where I will send all communications.

CENTER FOR ACCOMMODATIONS AND SUPPORT SERVICES

Students who wish to request accommodations must be registered with the Center for Accommodations and Support Services (CASS) Office in Room 106 of the Union East Bldg. You may contact them at (915) 747-5148 or cass@utep.edu for more information. Once you are registered with the CASS Office, I encourage you to schedule a time to meet with me (if you so desire) so that we may have a private conversation to discuss your accommodations, as recommended by CASS.

TECHNICAL SUPPORT

The IT Support Team can assist with Blackboard, password resets, and student e-mail accounts. Hours and other helpful information can be found at <http://www.helpdesk.utep.edu>.

COURSE GRADING & EXPECTATIONS

COURSE GRADING:

- Midterm Exams #1 - #3 45% (lowest grade will be dropped)
- Final Exam 30%
- Genetics Review Exercises (GREs) 25%

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

I may, at times, distribute extra credit that is designed to reinforce course concepts. It is your choice whether or not to complete these assignments. Please also note that the "+/-" grading system will *not* be used in this course as per departmental and university policies.

ATTENDANCE/PARTICIPATION

You attendance and participation in all parts of this course are expected. Given the virtual nature of this course, attendance is defined as the viewing of all online lecture materials, submission of all assignments, and completion of all online exams (i.e., more than merely accessing the course). Please note that my priority is to ensure that you are able to successfully complete the course and meet your own personal

learning goals this semester. Therefore, I **strongly encourage** you to reach out to me via e-mail in the event that you have difficulty accessing materials, require additional time on an assignment due to extenuating circumstances, etc. I will make every effort to assist you as best as I am able.

Your participation in the course is likewise vital, as it will allow you to gain the most from this experience. You will notice, for instance, that there are review/thought questions embedded within the video lectures, and activities/case studies will routinely be made available for you to work on throughout the semester. While the majority of these exercises are optional, it is in your best interest to complete them, as they are designed to assist you in reviewing content that will appear on subsequent exams.

BLACKBOARD

This class makes extensive use of Blackboard® (<https://adminapps.utep.edu/blackboardlearn>). You will use Blackboard to download/print lectures and other course materials, access exams, and check your grades. Please note that your login and password are the same as you would use to access your UTEP e-mail account. Please also note that new lecture materials will be released on Blackboard each week no later than Monday at 5:00pm (MT).

LECTURES

In an effort to facilitate your successful progression through the course, I have structured the schedule to include two lectures/activities per day (with some exceptions), just as would be the case if we were to meet in a face-to-face environment (please see the lecture schedule near the end of the syllabus). However, because our course will meet asynchronously, you may view lecture content at your own convenience once it is released. *Assignments and exams are the only items that **MUST** be completed on or by the date specified!* In order to increase access to lecture content, please note that each week's "Lecture Materials" folder will contain (at minimum) three items: (a) completed versions of that week's lecture notes; (b) a video lecture for each topic presented that week, per the course lecture schedule; and (c) an audio-only version of each lecture. In addition, a discussion board will be available in each week's folder, which will serve as a place to post general comments, concerns, and questions related to that week's material. As a rule of thumb, it is in your best interest to download/print the PowerPoint slides *prior* to viewing each lecture and then add notes as you listen to the lecture recordings. Furthermore, you may want to write down any questions that you have as you are listening; that way, you can submit the questions to the discussion board at a later date. Importantly, video-/audio-lectures can be downloaded and played (including fast-forwarding/rewinding) as often as you would like, so do not hesitate to revisit them as necessary.

MIDTERM EXAMS

Each of the three midterm exams will cover material from the lectures directly preceding it, not including material covered on previous midterm exams (if applicable). You are required to complete all examinations. Exams not taken will be averaged in as a grade of zero, with the lowest of the three midterm exam scores being dropped.

Midterm exams will be available online via Blackboard, as follows:

- **Exam #1** – Monday, July 17th, from 5:00am – 11:59pm (MT)

- **Exam #2** – Monday, July 24th, from 5:00am – 11:59pm (MT)
- **Exam #3** – Monday, July 31st, from 5:00am – 11:59pm (MT)

Each exam will consist of a series of **50 multiple-choice, matching, and/or TF questions**, and you will have **90 min.** to complete each midterm exam. Please note that you will be able to view all exam questions at the same time (i.e., on the same page rather than one question at a time), and you must complete exams in a single sitting once you begin.

PLEASE PREPARE! Although this is an online course and you will have access to the entirety of your lecture materials (among other resources) while completing each exam, the questions will be presented to you in a random sequence, so you must be prepared. Please note that the exam dates posted in the lecture schedule below are non-negotiable. Therefore, if you miss an exam without prior notification and approval, you will receive a score of zero for that exam.

FINAL EXAM

As was the case with the midterm exams, the final exam for this course will take place online via Blackboard. The exam is scheduled for **Monday, Aug. 7th, from 5:00am – 11:59pm (MT)**. Please note that the final exam is cumulative and will consist of **75 multiple-choice, matching, and/or TF questions**, with **2 hrs. and 45 min.** allotted to complete the exam. The format of the test is otherwise identical to that which is stated above for the midterm exams. The final exam is mandatory, and you must take the final at the scheduled time unless you have received prior approval to complete the exam at a different time.

GENETICS REVIEW EXERCISES (GRES)

In an effort to help you prepare for upcoming exams in the course, I will distribute (via Blackboard) several animation-based exercises that contain questions pertaining to the major topics covered within each module. **New exercises will open when their corresponding module is released and are due no later than 11:59pm (MT) on the day of the next upcoming exam**, unless otherwise noted. There will be eight (8) GRES distributed throughout the semester, with this series of assignments collectively accounting for 25% of your overall grade in the course.

Each GRE will consist of two components, as follows:

- **Video Assignment:** All video animations have been structured using the EdPuzzle online platform, which presents you with an opportunity to review (via questions embedded in the animation) material covered in the video/in class. In order to access the videos, you will need to register for an EdPuzzle student account. This can be done by: (a) clicking on the video assignment link; (b) clicking “Sign Up” on the EdPuzzle window that appears; (c) registering as a **student** using your full first name and last name, UTEP login, and a self-generated password; and (d) clicking “Join.” While watching the animation, I would strongly encourage you to take notes, with the intent that those notes will supplement other lecture notes/activities in the course. Once you have completed the animation in its entirety, please navigate back to Blackboard and click the “Mark Reviewed” button under the video link.

- **Wrap-Up Assessment:** Wrap-up assessments will consist of ten (10) questions, including both content-based and attitudinal items. These summative assessments will be untimed and are intended to provide an understanding of the extent to which the video itself impacted your comprehension of and comfort with the material.

The two components must be completed in **sequential order** prior to the due date. Please do not hesitate to let me know if you have any questions or concerns as you are working *or* if you experience any technical issues, and I will work to resolve them ASAP!

Note that the GREs will be graded on the basis of effort/completion rather than accuracy. Therefore, if you make an honest attempt to do your best on each GRE, you will receive full credit for that assignment. Late submissions will not be accepted except in instances of extenuating circumstances.

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LECTURE SCHEDULE

Module	Date	Lecture Topic(s)/Activities	Textbook Chapters	
MODULE #1: From Gene to Protein				
1	T	July 11	Course Overview	-
			Genetics: An Introduction	1
	W	July 12	DNA Replication I	10, 12
			DNA Replication II	10, 12
	R	July 13	<i>GRE #1: DNA Replication</i>	-
			Transcription	13, 14
	F	July 14	Translation	15
<i>GRE #2: Protein Synthesis</i>			-	
M	July 17	~~ EXAM ONE ~~		
MODULE #2: Gene Expression and Patterns of Inheritance				
2	T	July 18	Gene Expression I	16, 17
			Gene Expression II	16, 17
	W	July 19	Mutations and Repair	18
			<i>GRE #3: Mutations and Repair</i>	-
	R	July 20	Mendelian Genetics	3
			Mendelian Genetics Practice Problem Set	-
	F	July 21	Sex-linked Genetics	2, 4
<i>GRE #4: Sex-linked Genetics</i>			-	
M	July 24	~~ EXAM TWO ~~		
MODULE #3: Population and Evolutionary Genetics				
3	T	July 25	Non-Mendelian Inheritance	5
			Non-Mendelian Inheritance Practice Problem Set	-
	W	July 26	Inheritance Patterns and Pedigrees	6
			<i>GRE #5: Inheritance Patterns and Pedigrees</i>	-
	R	July 27	Population Genetics	25
			Population Genetics Practice Problem Set	-
	F	July 28	<i>GRE #6: Population Genetics</i>	-
Evolutionary Genetics			26	
M	July 31	~~ EXAM THREE ~~		
MODULE #4: "Hot Topics" in Genetics				
4	T	August 1	Genomics/Proteomics	20
			<i>GRE #7: Biotechnology and Genomics</i>	-
	W	August 2	Cancer Genetics + Case Study Exercise	23
			<i>GRE #8: Cancer Biology</i>	-
	R	August 3	Epigenetics	21
F	August 4	Online "Live" Review [Optional] / Open Study Day	-	