

GENETICS (BIOL 3320) – SPRING 2022

Instructor: Jeffrey T. Olimpo, Ph.D.

Office Hours: Tuesdays from 10:00am – 12:00pm *or* 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 office hours on an individual basis. If you would like to schedule an appointment, please send me an e-mail. 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.

COURSE STRUCTURE: AN OVERVIEW

Whether you have recently 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, the lecture portion of our course will be conducted **in an 100% in-person format**. To assist you in achieving your biology learning goals this term, I have applied the RIPE (Review, Interact, Practice, Examine) method to each unit. 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 bring to class, 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 and during class sessions, 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 most units/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 unit. 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 (6th Ed.)*; Benjamin A. Pierce.
W.H. Freeman, Publishers; ISBN-13: 9781319127121

NOTE: The textbook is **not required** for this course, and all assignments and exams will be structured around the lectures and activities delivered in class. 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. 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 ask that you please schedule a time to meet with me so that we may have a private conversation to discuss 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)
- COVID-19 Final Project 25%
- Genetics Review Exercises (GREs) 20%
- Attendance/Participation 10%

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, and attendance is **required** for all exams. 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 PowerPoint lectures, and we will frequently engage in activities/case studies together in class. It is in your best interest to complete these exercises, as they are designed to assist you in reviewing content that will appear on subsequent exams.

Notably, I will ask you to submit five activities for points. These activities include a:

- Brief introduction post on the “Community of Learners” discussion board, which will be due on Sunday, January 23rd
- DNA Replication case study exercise, which will be due on Thursday, January 27th
- Mendelian Genetics problem set, which will be due on Tuesday, March 1st
- Population Genetics problem set, which will be due on Thursday, March 31st
- Scientist Spotlight autobiography activity, which will be due on Thursday, April 28th

Specific instructions and information related to each activity will be distributed via the “Weekly Updates” announcements, with **all activities due no later than 11:59pm (MT) on the date specified**. Collectively, these activities will account for 10% of your overall grade in the course.

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 assignments, 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 Sunday at 5:00pm (MT).

LECTURES

Please note that **it is your responsibility to download and/or print the PowerPoint lectures for each week**. If you work better on a tablet/laptop, please feel free to bring your device with you to class. In reviewing the lecture notes, you will notice that there are several blanks on the slides. As the lecture proceeds, you will want to be sure to fill in these blanks based on the day’s material. A word of caution – these blanks *do* indicate important topics or ideas from the lecture; however, you should *not* only focus on those terms when studying for exams!

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. Because of this latter point, make-up exams will only be scheduled due to extenuating circumstances.

Each exam will consist of a series of **50 multiple-choice and T/F questions**, and you will have the full class period to complete each midterm exam. Note that you will **not** be allowed to listen to any portable device (cell phones included) during the exam, so please ensure that they are left in your backpack throughout the test. I will have the time displayed for you on the projector screen.

Please bring the following items with you to each exam:

- Several #2 pencils (and erasers)
- A four-function calculator
- Your UTEP student ID card

Please note that if you have approved accommodations from CASS and would like to complete the exam at CASS, you must request to do so at least 72 hours in advance.

COVID-19 FINAL PROJECT

Genetics is a complex and multi-faceted subject, and we will not (unfortunately) have time this semester to unpack and explore all aspects of the discipline. While this is the case, students are often interested in other areas of Genetics because of their connection to overall human development and health. The ongoing COVID-19 outbreak provides an unprecedented opportunity to learn more about this disease and its impact on both the El Paso border region and the world. For this project, you will explore aspects of the aforementioned pandemic by: (a) investigating the etiology, symptoms, mode of transmission, and established prevention measures outlined for COVID-19; (b) analyzing data associated with the COVID-19 outbreak; and (c) constructing your own recommendations for how our local community can continue its efforts to combat the novel coronavirus. Specific instructions for completing each portion of the project will be distributed near the end of the semester, in accordance with the lecture schedule. **All portions of the project will be due no later than 11:59pm (MT) on Thursday, May 12th. Note that this project replaces the final exam for the course!**

GENETICS REVIEW EXERCISES (GRES)

In an effort to help you prepare for upcoming exams in the course, I will distribute (via Blackboard) a series of animation-based modules that contain questions pertaining to the major topics covered within each unit. **New modules will open at 5:00pm (MT) on the release date and are due at 11:59pm (MT) on the specified due date** (please see the homework schedule below for all release and due dates for the semester), unless otherwise noted. There will be ten (10) GRES distributed throughout the semester, with this series of assignments collectively accounting for 20% of your overall grade in the course.

Each GRE will consist of three components, as follows:

- **Warm-Up Assessment:** Warm-up assessments will consist of five (5) content-based questions. These assessments will be untimed and are intended to provide a baseline representation of your understanding of the topical focus of each GRE.
- **Video Assignment:** After completion of the warm-up, you will be able to access the animation associated with the GRE content topic. All video animations have been structured using the

EdPuzzle online platform, which presents you with additional opportunities 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 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.

Each component 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!

GRE #	Topic	Release Date	Due Date
1	DNA Replication	Jan. 25 th	Feb. 1 st
2	Protein Synthesis	Feb. 3 rd	Feb. 10 th
3	Gene Expression	Feb. 15 th	Feb. 22 nd
4	Mutations	Feb. 22 nd	Mar. 1 st
5	Sex-linked Genetics	Mar. 3 rd	Mar. 10 th
6	Pedigrees	Mar. 22 nd	Mar. 29 th
7	Population Genetics	Mar. 29 th	Apr. 5 th
8	Evolutionary Genetics	Apr. 7 th	Apr. 14 th
9	Biotech./Genomics	Apr. 19 th	Apr. 26 th
10	Cancer Genetics	Apr. 26 th	May 3 rd

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LECTURE SCHEDULE

Wk.	Date	Lecture Topic(s)	Textbook Chapters
UNIT #1: From Gene to Protein			
1	T Jan. 18	Course Overview/Genetics: An Introduction	1
	R Jan. 20	DNA Replication I	10, 12
2	T Jan. 25	DNA Replication II	10, 12
	R Jan. 27	DNA Replication Case Study Exercise	-
3	T Feb. 1	Transcription	13
	R Feb. 3	Transcription (Cont'd)/Translation	13
4	T Feb. 8	Translation (Cont'd)	13
	R Feb. 10	~~ EXAM ONE ~~	
UNIT #2: Gene Expression and Patterns of Inheritance			
5	T Feb. 15	Gene Expression I	14, 15
	R Feb. 17	Gene Expression II	14, 15
6	T Feb. 22	Mutations/Repair	18
	R Feb. 24	Mendelian Genetics I	3
7	T Mar. 1	Mendelian Genetics II/Case Study Exercise	3
	R Mar. 3	Sex-linked Genetics	2, 4
8	T Mar. 8	Non-Mendelian Inheritance	5, 11
	R Mar. 10	~~ EXAM TWO ~~	
UNIT #3: Evolutionary, Population, and Quantitative Genetics			
9	~~ SPRING BREAK ~~		
10	T Mar. 22	Inheritance Patterns and Pedigrees I	6
	R Mar. 24	Inheritance Patterns and Pedigrees II	6
11	T Mar. 29	Population Genetics	25
	R Mar. 31	Population Genetics Case Study Exercise	25
12	T Apr. 5	Evolutionary Genetics I	26
	R Apr. 7	Evolutionary Genetics II	26
13	T Apr. 12	Quantitative Genetics	24
	R Apr. 14	~~ EXAM THREE ~~	
UNIT #4: "Hot Topics" in Genetics			
14	T Apr. 19	DNA Techniques and Biotechnology	19
	R Apr. 21	Genomics/Proteomics	20
15	T Apr. 26	Cancer Genetics	23
	R Apr. 28	Scientist Spotlight Autobiography Activity	-
16	T May 3	COVID-19 Project (Open Work Session)	-
	R May 5	COVID-19 Project (Open Work Session)	-

SUPPLEMENTAL INSTRUCTION + TIPS FOR SUCCESS IN BIOL 3320

GRADUATE LEARNING ASSISTANT – KAREN SANTILLAN



Please join me in welcoming Ms. Karen Santillan as our graduate learning assistant for BIOL 3320 this semester. Karen will be available to assist with one-on-one/group tutoring sessions and any questions or concerns that you might have. Outside of her office hours (TBD), she can best be reached via e-mail at kasantillan@miners.utep.edu.

TIPS FOR SUCCESS

1. **Create a “Cheat Sheet” for each Lecture**

At the end of each lecture, I would encourage you to create a one-page “cheat sheet” that outlines the content of that lecture. You do not have to (nor should you) copy everything from the PowerPoint notes onto your sheet word-for-word. Instead, ask yourself: *What are the most important concepts from this lecture? What terms, tips/tricks, etc. will I want to have access to come exam time? Are there specific visuals that I want to include on my sheet?* These are the items that you should write down. Broadly-speaking, you should also make sure that your “cheat sheet” is organized. If you cannot locate specific information when necessary, the sheet will not be as useful to you as it otherwise could be.

2. **Science is a Different Language**

This is the only time I am going to condone memorization. You just cannot get by in a biology course (or any science course) without having an understanding of the definitions and terminology used by that discipline. In my opinion, the easiest way to accomplish this goal is to keep a series of notecards containing the definitions of popular terms that have been discussed in lecture. Do **NOT** try to copy everything from your notes onto a flashcard – this will only become overbearing. Instead, consider the notecards as one strategy (among many) to facilitate your learning.

3. **Your Textbook is a Resource**

Your textbook is a guide and a resource. It is not meant to replace participation in the course, and we will not cover much of the minutia discussed in the book. That does not mean you should not read it. Just be aware that it is a tool to support your learning, not a mechanism to learn via osmosis.

4. **Find a “Study Buddy” or form a Study Group**

Do this sooner rather than later, but only if study groups help you!! Try re-teaching lectures to your friends or quizzing them on important topics. If you are capable of teaching material to your group, believe me, you understand it.

5. **Get Help Sooner, not Later**

If you are having difficulty with a topic, do not wait to seek help. Information about how to schedule an appointment with me is on the first page of this syllabus. *Please reach out!!* I enjoy working with students and am here to help, no matter what question you might have!

6. **Budget your Time Wisely**

I understand that you have other classes and obligations. The rule of thumb has always been to spend 2-3 hours outside of class each week for every hour “in class.” Personally, I find that to be insane. Instead, I recommend keeping a calendar that indicates, each day, what goals you intend to accomplish for BIOL 3320. It does not have to be anything big, either. Your goal might be “make flashcards for Chapter 3.” Setting reasonable and manageable goals will help keep you motivated.

7. **Stay Positive!**

I got a “D” on the first biology exam I ever took in college, and I about lost it. But here I am, more than 10 years later, still in one piece (I know; I am old). My point: *stick with it!* Believe in yourself and do everything you need to do to succeed. And remember, I am here to help!

*** Disclaimer: I reserve the right to change the contents of this syllabus due to unforeseen circumstances. Students will be given notice of relevant changes through Blackboard and e-mail. Exam dates will **NOT** change.***

WELCOME TO BIOL 3320!!! 😊