Genetics
Biology 3332
Fall 2025

Instructor Information: Dr. Katrin Kellner
Department of Biology
The University of Texas at Tyler
3900 University Blvd, Tyler, TX 75799
Office: HPR 104
Office hours: MWF, 9– 10 am, MT, 1 – 2pm or by appointment
Email: kkellner@uttyler.edu

E-MAIL POLICY: When sending an email, please add "BIOL3332" at the beginning of the title and clearly indicate your **name** in the first few sentences of the main text. Please note that the instructor may not be able to respond to emails in two working days.

COURSE FORMAT: This course is in a face-to-face format and will be held at the designated time and place, unless otherwise communicated through Canvas. Attendance is required in this course. You will find a calendar with the planned program in this syllabus. Please check Canvas frequently for changes and updates. All deadlines are listed as Central Time.

COURSE DESCRIPTION: This course provides an overview of the principles and concepts of heredity and molecular genetics. Three areas of genetics will be covered: Mendelian (or transmission) genetics, molecular genetics, and population/evolutionary genetics. While easily divided into these units, they are by no means independent, each being tied to the others. Major concepts to be covered will include how the genetic material: 1) replicates and is passed on, 2) contains information that results in a phenotype, and 3) can change. Recent discoveries, historical concepts and some applications will be discussed.

COURSE GOALS: 1) Students will understand the concepts of classical, molecular, and population genetics. 2) Students will solve genetics problems. 3) Students will make connections between genetics, their lives and other disciplines.

LEARNING OUTCOMES: Upon completion of BIOL 3332, the student should be able to

1. list, state, and define the terms of genetic transmission, expression, and change
2. summarize, describe, analyze, categorize, synthesize, and evaluate the principles and processes of genetic transmission, expression, and change
3. assess the merits of genetic hypotheses

4. recall, draw, diagram, interpret, the processes of genetic transmission, expression, and change
5. solve problems, formulate hypotheses, calculate results, based on data generated from genetic experiments

RECOMMENDED BOOKS/Materials:

There are many good genetics textbooks out there, and I recommend that you get access to a book for in depth readings. For this course, it is NOT required that you buy a specific book. The essential materials (lecture slides, videos, animations, online tutorials, practice questions, etc.) can be found through Canvas.

Lecture slides are based on these two books:

- Concepts of Genetics 12e by Klug, Cummings, Spencer, Palladino, Killian, Pearson, 2018
- Principles of Genetics by D. P. Snustad and M. J. Simmons, 6th, John Wiley & Sons, Inc, 2011

COMMUNICATION

Announcements: Announcements are found on Canvas, and depending on your Canvas settings for this class, you will get notified if there is a new one. Please make a point of reading the announcements. This is how I will communicate with the class when there is important information you need.

Office hours: I am available MWF, 9 am – 10 am, and MT 1-2 pm. If the above hours do not work for you, please contact me anyways and we will set up a time that works for both of us.

Important Note: This syllabus, along with course assignments and due dates, are subject to change. It is your responsibility to check Canvas for corrections or updates to the syllabus. Any changes will be clearly noted in a course announcement.

GRADING POLICY: The final grade will be determined as follows:

Exam 1	100 pts
Exam 2	100 pts
Exam 3	100 pts

Final Exam	150 pts
Assignments/Homework/Quizzes	160 pts
Participation & Attendance	100 pts
TOTAL	**710 pts**

Letter grades will be assigned according to the following scale:

A = above 90%

B = 80-89%

C = 70-79%

D = 60-69%

F = below 60%

Exams

Three exams (each 100 pts). Exam questions will be multiple choice, true and false, and short answer style. Exams cover material from the previous chapters. Exams are spaced throughout the semester (see schedule below). The Final Exam is cumulative (150pts).

Make-up Exam Policy

If you are unable to take an exam as scheduled, a make-up exam will be arranged ONLY if the reason is legitimate (illness, sport and religious events, emergencies, etc.), and written documentation is provided (doctor's note, etc.). A make-up exam will have to be scheduled no later than one week after the missed exam. Students who fail to make appropriate arrangements will receive zero points for the missed exam. Make-up exams are in the same style as the regular exams but contain different questions.

Behavior during Exams: Being -Late-to-Exam Policy

Students who are late more than 10 minutes after an exam has started will receive a zero and are not allowed to enter the exam room. Students are required to keep their desks clear of backpacks, purses, jackets and such. No cell phones, laptops or tablets can be out on the tables. Students can bring their own calculator or obtain one from the instructor. Cell phones, tablets and laptops are not allowed as calculators for exams.

Practice Quizzes/Homework/Assignments

For each chapter, there will be an online assignment. This can be an assigned reading, a worksheet with instructions, or an online Quiz (each 10 pts). The assignments can be found online on Canvas. You have one week time to turn in your quiz. Points will be drawn for late work.

In-class Participation & Attendance

In-class Participation is strongly encouraged in this course. There will be a sign in sheet to take attendance. To calculate the attendance grade, students will count the numbers of classes attended and divide that by the total number of classes where attendance was taken. Students can receive a maximum of 100 points for participation. Unless students have an excused absence, there are no make-up points for missed attendance.

LECTURE SCHEDULE:

Please note that this is a tentative schedule. The dates for the exams are tentative and can be flexible.

Course Content Overview

Welcome! Class Orientation-Syllabus and Canvas
Introduction: The Science and History of Genetics
Topic 1: Cellular Reproduction: Mitosis & Meiosis
Topic 2: Mendelian Genetics: The Basic Principles of Inheritance
Topic 3: Extensions of Mendelian Genetics
9/17/2025 Exam I
Topic 4: Complex Traits and the Genetics of Behaviour
Topic 5: Sex determination and Sex chromosomes
Topic 6: Chromosome Mapping, Linkage, Crossing Over: The Chromosomal Basis of Mendelism
Topic 7: Chromosomal Mutations: Variation in Number & Arrangement
Topic 8: Population & Evolutionary Genetics
10/15/2024 Exam II
Topic 9: The Human Genome Project/Introduction to Molecular Genetics
Topic 10: The Genetics of Bacteria and their Viruses
Topic 11: DNA Structure and Analysis, Chromosomes
11/7/2024 Exam III
Topic 12: DNA Replication and recombination
Topic 13: The Genetic Code and Transcription

Topic 14: Translation and Proteins
Topic 15: Gene Mutations and DNA Repair
Topic 16: Regulation of Gene Expression
TBD Final Exam

CANVAS: Students should log onto Canvas ASAP and carefully read all announcements. Canvas and student email should be checked DAILY for new announcements or messages. On Canvas you will find lecture outlines, reviews for exams, videos, and much more that will be very helpful for you as you take this course. You will also have quizzes posted throughout the semester under the module sections (labeled Quizzes). Another helpful tool is that all course grades will be on Canvas, so students will be able to view and calculate their current course grade at any time.

Academic Integrity: Students should be aware that absolute academic integrity is expected of every student in all undertakings at The University of Texas at Tyler. Failure to comply can result in strong university-imposed penalties. Be forewarned that possession of anything containing course content will be considered cheating, whether or not you actually refer to it during the exam. Also be aware that 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. This includes the use of cell phones (even if they call YOU) or any other electronic device that could be used to record test material. Violation of this policy will be considered cheating and treated accordingly. Penalties for cheating include anything from a zero on the exam or quiz during which the cheating occurred, up to an F for the course in question, at the discretion of the instructor

Usage of AI

UT Tyler is committed to exploring and using artificial intelligence (AI) tools as appropriate for the discipline and task undertaken. We encourage discussing AI tools' ethical, societal, philosophical, and disciplinary implications. All uses of AI should be acknowledged as this aligns with our commitment to honor and integrity, as noted in UT Tyler's Honor Code. Faculty and students must not use protected information, data, or copyrighted materials when using any AI tool. Additionally, users should be aware that AI tools rely on predictive models to generate content that may appear correct but is sometimes shown to be incomplete, inaccurate, taken without attribution from other sources, and/or biased. Consequently, an AI tool should not be considered a substitute for traditional approaches to research. You are ultimately responsible for the quality and content of the information you submit. Misusing AI tools that violate the guidelines specified for this course (see

below) is considered a breach of academic integrity. The student will be subject to disciplinary actions as outlined in UT Tyler's Academic Integrity Policy.

For this course, AI is not permitted in this course at all.

To best support your learning, you must complete all graded assignments by yourself to assist in your learning. This exclusion of other resources to help complete assignments includes artificial intelligence (AI). Refrain from using AI tools to generate any course context (e.g., text, video, audio, images, code, etc.) for an assignment or classroom assignment.

Student Resources

University Policies and Information