

BILD 20: Human Genetics in Modern Society

2022 Summer Session I

Instructors Email	Class Time & Location	Office Hours
Professor Brinda K. Rana, Ph.D. Contact through Canvas Mail	Lectures: M/W 5:00-7:50pm Peterson Hall 104	After Class
IA: Viet Nguyen	DI: Tu/Th 4:00-5:50 pm Warren Lecture Hall 2114	TBA
IA: Samantha Ivezich	DI: Tu/Th 5:00-6:50 pm Warren Lecture Hall 2114	TBA

Course Description

This course will introduce students to the principles of genetic inheritance in human populations and current applications of human genetics and genomics in medicine, behavioral research, and society.

Learning Objectives

- ❖ Understand the nature of genetic variation and how it contributes to phenotypic variation and disorders.
- ❖ Learn about the various study designs applied to investigate the role of genes versus the environment in phenotypic variation.
- ❖ Learn how to conduct a hypothesis test.
- ❖ Use online resources to investigate genetic variants and their role in phenotypic variation and disorders.
- ❖ Develop skills to read genetic manuscripts and critically evaluate genetic reports in the media.

Assessments

Midterm Group Presentation (30 points)

Monday (7/25) or Wednesday (7/27) 6:00-6:50pm in lecture.

Quizzes (60 pts)

Five 20-minute quizzes will be given at the end of lecture. The lowest of the five scores will be dropped.

Class Participation (20 pts)

Throughout the course, there will be short activities in class or online.

Final Exam (90 points)

Date/Time: Friday, July 29 7:00-9:50 pm

Grading

A total of 200 points are available for the course. Grades are based on the total number of points earned through the evaluation (see right column):

≥180 points (90%) A (A+, A or A-)

≥160 points (80%) B (B+, B or B-)

≥140 points (70%) C (C+, C or C-)

≥120 points (60%) D

Cutoffs may be adjusted downward so that at least 50% of students receive an A or a B, but cutoffs will not be adjusted upward for any reason.

Date	Lecture Schedule
Monday 6/27	1. Course Introduction 2. The DNA Molecule and the Central Dogma 3. Mendelian Patterns of Inheritance & Introduction to Pedigrees
Wednesday 6/29	1. Mendelian Patterns of Inheritance & Introduction to Pedigrees Part II 2. Modification of Mendelian Ratios 3. Video Assignments: The Scientific Method & Hypothesis Testing Chromosomal Theory of Inheritance & Meiosis QUIZ 1 due on Friday on CANVAS
Monday 7/4	4 th of July Holiday! No Lecture
Wednesday 7/6	1. Genetic Adaptation & Modern Human Evolution: Lactose Intolerance 2. Sex Determination & Dosage Compensation: The Lyon Hypothesis 3. Complex Traits and Diseases I QUIZ 2 due on Wed at 10pm on CANVAS
Monday 7/11	1. Genetic Counseling Guest Lecture: Diego Quintero (UCSD Alumnus) Stanford Genetic Counseling Program 2. Video Assignment: Eugenics
Wednesday 7/13	1. Complex Traits and Diseases II 2. Genome Wide Association Studies 3. Twin Studies QUIZ 3 due on Wed at 10pm on CANVAS
Monday 7/18	1. Genetics of Brain Imaging and Psychiatric Disorders Guest Lecturer: Carolina Makowski, PhD 2. Molecular Genetic Tools: PCR, Sequencing, and CRISPR Gene Editing
Wednesday 7/20	1. Epigenetics 2. COVID-19 Genetics 3. In-Class PCR Activity QUIZ 4 due on Wed at 10pm on CANVAS
Monday 7/25	1. Midterm Presentations of Group Projects 2. Cancer Genetics
Wednesday 7/27	1. Midterm Presentations of Group Projects 2. Personalized Medicine & Direct-to-Consumer Testing QUIZ 5 due on Wed at 10pm on CANVAS
Friday 7/29 7pm-9:50pm	Final Exam In-Class (Scantrons will be supplied)

PROBLEM SETS & READINGS

Problem sets and readings to be discussed in Discussion Sections are posted on CANVAS. Klug et al. Essentials of Genetics, 9th edition is a good reference but you are not required to purchase this text book. The 8th edition is equally useful and you may be able to find the 8th edition at a discounted price online.

DISCUSSION SECTIONS

Weekly discussion sections are designed to help you develop the skills in problem solving and data analysis that will be important on the exams and provide you with the opportunity to build relationships with fellow students and your IA.

FINAL PRESENTATIONS

Students will work in groups of 5-6. Students will submit their selected topic by the end of lecture on July 27. A 10-minute (live) oral presentations will be given online (ZOOM) by each group during the set time. One copy of the slides is to be turned in by each group on CANVAS. Sign-ups for oral presentation time slots will be on CANVAS. Students who anticipate issues with attending the live online oral presentation should discuss options with the instructor.

EXAM AND QUIZ INFO AND POLICIES

Students with accommodations for exams from the Office of Students with Disabilities must provide their accommodation letter to Dr. Rana at the beginning of the quarter or as soon thereafter as the letter becomes available. Please contact Dr. Rana about a week before each exam to arrange for your accommodation. Please speak with your IA regarding how your accommodation will be applied to quizzes.

After the grading of each exam is completed, you can view your score at the course website in Canvas by clicking "Grades" on the left menu.

If you find an error in the grading of your exam, you can request a regrade by submitting your exam to Dr. Rana in class with a note attached explaining the grading error. The deadline for a re-grade on the exams is July 27 for Quizzes (Aug 2 for final). No requests will be considered after this date, except for correction of point addition errors. If you believe there was an error in the grading of one of your quizzes, you must raise this concern before the date.

If you have an illness, injury or personal crisis that you believe will prevent you from performing adequately on an exam, contact the instructor about this problem before the exam to discuss your options. If you cannot do this and miss an exam for one of these reasons, contact the instructor as soon as possible. Once you have taken an exam (or part of it), you will not be able to drop the score or negotiate a reduction in its impact on your grade for any reason, so it is imperative that you decide you are well enough to take an exam before it starts.

ACADEMIC DISHONESTY

Academic dishonest (aka cheating) will not be tolerated in this class. According to UCSD policy, academic dishonesty includes:

- taking an exam for another student
- allowing another student to take an exam for you
- copying another student's work on an exam or quiz
- allowing another student to copy your work
- altering graded assignments and submitting them for a regrade⁺
- responding to clicker questions in class using another student's clicker*

Any student caught or suspected of violating the principles of academic integrity at UCSD by doing one of the things on the list above will be reported to the UCSD Academic Integrity Coordinator and the Dean of the student's college. Confirmed cases of cheating will result in a reduction in the student's grade – violations determined by the instructor as particularly serious (e.g. cheating on an exam or repeated instances of cheating) will result in the student receiving an F as their final grade as well as other disciplinary actions determined appropriate by the Academic Integrity Coordinator.