



Human Genetics | Lecture and Lab

Academic Year 2020-2021

Course Information

Course Numbers	Total Credits	Time Requirement
GEN331/GEN331L	4 (3 Lecture + 1 Lab)	75 hrs (Lecture 45hrs + Lab 30hrs)

Course Details

Recommended Prerequisites

High School Diploma or equivalent; General Biology I and II are highly recommended

Course Description

This course will address the study of mechanisms of traits inheritance and genetic variety in humans. This will require an understanding of Mendelian genetics rules and its extensions, cellular genetics and chromosomal mutation, molecular genetics and analysis of replication, transcription, and translation, and a closer look at cancer, as well as analysis of genetics aspects of health and wellness areas like cancer and biotechnology, evolutionary genetics, genetics and populations and a brief review of ethics in genetics.

Lecture and Laboratory Communication

A website will be set up on Canvas by your instructor.

Log in with your Username and password: <https://scuhs.instructure.com>

Faculty Information

Refer to the Canvas course webpage for this information.

Class Meeting Times

Refer to Canvas course webpage for this information.

Instructional Materials

Required Text(s)

Lecture: Human Genetics by Lewis, 12th ed. LearnSmart, LearnSmart Prep; ISBN-13 : 978-1259700934

Lab

SCU Human Genetics Laboratory Manual (available on Canvas)

Provided Materials: PPE (Personal Protection Equipment): UVEX goggles, gloves, and flame-resistant lab coat.

Required Attire: Close-toed shoes, professional attire and lab coats are mandatory during all lab hours. No shorts, heels, or flip-flops will be allowed in the laboratory; hair longer than shoulder-length must be pulled back and held with a clip or hair tie. Gloves, goggles, and additional safety equipment will be required per experiment.



Course Purpose

Student Learning Outcomes

At the conclusion of this course, a successful student should be able to:

1. Absorb Mendelian genetics, its extensions, and postulates.
2. Understand chromosome mapping.
3. Differentiate between sex chromosomes and sex determination.
4. Examine various forms of chromosomal mutation.
5. Deepen understanding of DNA replication, transcription, and translation.
6. Comprehend cancer on a mechanistic level.
7. Analyze the biotechnology and ethical aspects of genetic applications.

Course Schedule

(subject to slight modifications by the instructor)

Week	Lecture	Assessment
1	Module 1: What Is in a Human Genome? Module 2: Cells Module 3: Meiosis, Development, and Aging	Reading Assignments, Quizzes, Exams
2	Module 4: Single-Gene Inheritance Module 5: Beyond Mendel's Laws Module 6: Matters of Sex	Reading Assignments, Quizzes, Exams
3	Module 7: Multifactorial Traits Module 8: Genetics of Behavior Module 9: DNA Structure and Replication	Reading Assignments, Quizzes, Exams
4	Module 10: Gene Action: From DNA to Protein Module 11: Gene Expression and Epigenetics Module 12: Gene Mutation Systems	Reading Assignments, Quizzes, Exams
5	Module 13: Chromosomes Module 14: Constant Allele Frequencies and DNA Forensics Module 15: Changing Allele Module 16: Cancer Genetics and Genomics	Reading Assignments, Quizzes, Exams

Tentative Grading Procedures

Lecture

Assessment	Points per assignment	Total number of assignments
Reading Assignment	20	16 (1 per module)
Quiz	20	16 (1 per module)
Module Exam	50	16 (1 per module)

Lab Schedule

(subject to slight modifications by the instructor)

Laboratory	Assessment
1) Mendelian genetics	Lab notebook
2) The Cell Cycle and Mitosis	Lab notebook
3) Meiosis & Sexual Reproduction	Lab notebook
4) Patterns of inheritance	Lab notebook
5) Punnet Squares Activity	Lab notebook
6) Human Karyotyping	Lab notebook
7) Human Blood Typing	Lab Midterm Lab notebook
8) Gender Determination	
9) DNA Replication & Gene Expression	Lab notebook
*Watch video and ethical dilemma discussion on genetic engineering.	Lab notebook
10) DNA Extraction	Lab notebook
11) DNA scissors	Lab notebook
10) DNA Extraction	Lab notebook
11) DNA scissors	Lab notebook
14) Genetic Linkage	Lab notebook
15) Population Genetics	Lab notebook
	Lab Final

Tentative Grading Procedures

Lab

Assessment	Weight (%)
Lab Notebook	20
Lab Midterm	35
Lab Final	35
Participation (lab activities)	10
Total	100

Grading scale:

Please note letter grades will be assigned only at the end of the trimester.

A = 90% to 100%

B = 80% - less than 90%

C = 70% - less than 80%

D = 60% - less than 70%

F = less than 60%

W = Withdrawal

Grading procedures:

The format of assessments may include multiple choice, short answer, labelling, fill-in-the-blank, or matching examinations. Participation points are required and will be assigned by the instructor as the course progresses using any of the following: in class mini quizzes, activities, online quizzes. For online quizzes students must have a phone, tablet, laptop or other internet connected device to participate. Students must be in class during the participation activities to receive participation marks.



Academic Integrity

Visit SCU's [Academic Integrity](#) page to review policies for professionalism and academic integrity.

Teaching Methods and Activities

Each week's material is divided into three or four modules, for a total of 16 modules. The course will follow a linear format, meaning you will complete all the modules in sequence. The material in each module will include a combination of readings, videos, and written and interactive assignments. You'll also complete an exam at the end of each module. You may engage in discussions with your peers throughout the course. You can read about each of the course components below. Each module takes about 5 hours to finish. The flow of the modules on Canvas should be followed.

The course requires a significant time commitment from students. This commitment is both in terms of reading lecture PowerPoints prior to reading the chapters, as well as reviewing the material and doing "Check Your Understanding" activities after. In the five weeks of classes, we will cover 16 chapters of the book. Not every topic will be covered in great depth, but students are expected to study each topic in detail.

Introduction: These sections introduce the content covered in each module and outline the learning objectives. Reading the Introduction will help you identify the central concepts of the module and connect what you will learn to the broader context of the course.

Lecture Outline: These sections contain the lecture slides for each chapter. They provide a comprehensive summary of the chapter. Reading the lecture slides prior to doing the reading assignments on Learning Smart will help you to formulate your thoughts and promote active learning.

Reading Assignment: These sections are created on "Connect" through SmartBook. They improve reading productivity and provide students with better knowledge retention. SmartBook is an intelligent eBook that applies the adaptive technology of LearnSmart to ensure a focus on content the student hasn't learned while also promoting long-term retention of learned material. Learn more about this technology at LearnSmart.

Key Point: Its content helps you gain a deeper understanding of the concepts presented in the learning modules and in the textbook. Often, Key Point pages feature animations, games, videos, or other interactive learning resources.

Check Your Understanding: On Check Your Understanding pages, you will practice the module content you've covered using interactive study tools. These interactive study tools will help you assess your progress and identify areas for improvement. Additionally, interactives give you an opportunity to review and apply information presented in your course and in the online textbook before taking exams.

Exams: There will be 1 exam given at the end of each module for a total of 16. There will be questions that come directly from the textbook chapters, activities, and videos. Questions may come in the form of multiple choices, free response, or fill in the blank. Students will have 30 minutes to complete each exam. These exams are all on Connect. Please pay attention to the due dates. They are final and will not be extended. You must use a Remote Exam proctoring software to proctor your exams (all 16 exams). You need to have both video and audio on. You need to start the recording prior to starting the test and end after finishing the test. Your face should be in the field of view.



Online Learning at SCU: MySCU is SCU's online campus portal. It includes SCU's learning management system (Canvas). It acts as a single point of access for a variety of campus information. It houses resources such as university policies, campus safety procedures, financial aid forms, class schedules, campus news, library databases, and other electronic resources for faculty, staff, and students. Incoming students receive login credentials and learn to navigate MySCU during orientation.

The course requires a significant time commitment from students. This commitment is both in terms of reading lecture outlines prior to reading the chapters, as well as reviewing the material.

Required Attire

Close-toed shoes, professional attire and lab coats are mandatory during all lab hours. No shorts, heels, or flip-flops will be allowed in the laboratory; hair longer than shoulder-length must be pulled back and held with a clip or hair tie. Gloves, goggles and additional safety equipment will be required per experiment.

Classroom Expectations

Please be professional, prompt, prepared, and polite always.

The professor will adhere to all policies as found in the Student Handbook. Cellular phones must be kept on silent during class and lab times. Students may not use a phone as a calculator. As a safety precaution, no food or drinks are allowed inside the lab, but there will be a designated break for eating and drinking outside of the lab.

University Policies

Accommodations

As a learning-centered community, Southern California University of Health Sciences recognizes that all students should be afforded the opportunity to achieve their academic and individual potential. The University recognizes and supports the standards set forth in Section 504 of the Rehabilitation Act and

the American with Disabilities Act (ADA). In accordance with its mission and federal and applicable state laws, the University is committed to making reasonable accommodations for qualified applicants for admission and enrolled students with disabilities. A student who needs accommodation(s) due to a disability should contact the Academic Support Office located in the Learning Resource Center.

Faculty and Dr./Patient Relationships

SCU faculty are highly skilled. However, per University Policy, health care is offered to students through the University Health System only. Neither preclinical nor clinical faculty can provide advice, assessment, treatment, or other elements that would be considered part of a Doctor-Patient relationship outside of a clinical setting established for that purpose.

Learning Activities

Students are expected to spend at least two hours for each lecture hour of course time per week in activities and assessments outside the classroom. Examples of activities include but are not limited to writing papers; reading articles or text; small group work; presentations; completing assignments; preparation for assessments; online activities and other activities that do not include direct instructor interaction and involvement.



All university policies apply to this course and all others. For full policy information please consult the university SCU Policy Manual. For a quick reference guide to the following policies: make-up examination, F-challenge examination, grade posting, results of failing grades, student support information, syllabus amendments, special needs, student conduct, and attendance, please consult the academic policies document housed on the [Online Student Services](#).