

USC Dornsife
College of Letters,
Arts and Sciences

**HBIO370 – Genetics and Diseases (4 units)
Spring 2022**

Lecture: Tue/Thu 12:30-1:50

Location: VPD 105

Lecture Instructor: Gioia Polidori, PhD

Office: AHF B40

Office Hours: Thu 5-7pm, Fri 2-4pm

Contact Info: gpolidor@usc.edu

Discussion Instructor: Daniel Aslan

Contact Info: aslan@usc.edu

Discussion:

Section number 38458D

Time 11:00-11:50 p.m.

Day Tuesday

Location VPD 107

Section number 38459R

Time 11:00-11:50 p.m.

Day Thursday

Location VPD 107

Section number 38460R

Time 11:00-11:50 p.m.

Day Wednesday

Location VPD 107

In Spring 2022 the first week of instruction will be online and discussions will begin on week 2.

Course Description

The course provides an overview of the genetic underpinning of human health and disease. Topics include, but are not limited to the inheritance of mendelian diseases, common diseases, developmental disease and cancer as well as prenatal testing, genetic counseling and genetic therapies.

I. Prerequisite: BISC 220.

II. Required Text:

Emery's Elements of Medical Genetics, 15th edition. Peter Turnpenny and Sam Ellard.

III. Learning Objectives

- Describe the structure and function of genes and chromosomes as well as their organization in the human genome

- Apply genetic principles to explain the inheritance of selected mendelian and multifactorial human diseases
- Integrate and apply concepts in anatomy, physiology, pathology and genetics to solve case studies through independent study and self-directed group projects
- Solve various inheritance, pedigree and epidemiology problems applying probability concepts and Bayes' theorem
- Discuss and analyze how genetic variation, together with environmental factors, contribute to the naturally occurring manifestations of human diversity
- Use relevant sources of scientific evidence to construct a well-supported, logical argument and apply it for the resolution of ethical and sociocultural issues as they relate to human genetics

IV. Description and Assessment of Assignments

- Class material will be evaluated via quizzes, case studies and exams.
- Problem-based learning activities will entail the use of case studies to apply the knowledge acquired in class to solving real world problems. Each week students will work on a case study in groups and submit their answers on blackboard for grading.
- Quizzes will be given during lectures and will be based on the material discussed as a way to promote interactive learning.
- Debates will address issues concerning genetic testing. Students will work in groups so that each student will participate in one debate. Depending on enrollment, the duration and student distribution in debate projects will vary.

V. Grading Breakdown

Assignment	% of Grade
Midterm 1	25
Midterm 2	25
Final Exam	25
Case Studies	15
Debate	5
Quizzes	5
TOTAL	100
JEP (Extra Credit)	2.5

VI. Grading Scale

- The grading scale is based on the traditional scale as follows:

	A (≥93%)	A- (≥90%)
B+ (≥87%)	B (≥83%)	B- (≥80%)
C+ (≥77%)	C (≥73%)	C- (≥70%)
D+ (≥67%)	D (≥63%)	D- (≥60%)
F (≤59.9%)		

Tentative Lecture Schedule

Date	Lecture Topic	Chapter
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Jan. 11	Intro	
Jan. 13	Molecular Basis of Inheritance I	2
Jan. 18	Molecular Basis of Inheritance II	2
Jan. 20	Molecular Basis of Inheritance III	3
Jan. 25	Patterns of Inheritance I	6
Jan. 27	Patterns of Inheritance II	6
Feb. 1	Population Genetics	7
Feb. 3	Genetic Problems	7
Feb. 8	Risk Calculation	8
Feb. 10	Pedigree Analysis & Risk Calculation	7-8
Feb. 15	<i>Review</i>	
Feb. 17	Midterm I	
Feb. 22	Genetics of Common Diseases	10
Feb. 24	Diseases of Hemoglobin I	12
Mar. 1	Diseases of Hemoglobin II	12
Mar. 3	Immunogenetics	13
Mar. 8	Genetics of Cancer	14
Mar. 10	Spring Recess	
Mar. 15	Spring Recess	
Mar. 17	Personalized Medicine	15
Mar. 22	Inborn Errors of Metabolism	18
Mar. 24	Review	13
Mar. 29	Midterm II	
Mar. 31	Development	9
Apr. 5	Congenital Abnormalities I	16
Apr. 7	Congenital Abnormalities II	16
Apr. 12	Chromosome Disorders	17
Apr. 14	Monogenic Disorders I	19
Apr. 19	Monogenic Disorders II	19
Apr. 21	Prenatal Testing	20
Apr. 26	Genetic Counseling	21
Apr. 28	Review	
	<i>Study Days</i>	
	<i>Final Exam: see schedule of classes</i>	

VII. Additional Policies

- A midterm exam can be taken after the specified date **ONLY** if the student has a **documented** medical excuse.

- A request to take a make-up exam must be accompanied by evidence of necessity (ie: letter from a doctor, plane ticket to a game from an athlete) and must be made before the date of the scheduled exam. Make-up exams will be different from the scheduled exam and may be proctored by personnel who do not have extensive knowledge in the area being tested.
- Lecture slides will be posted on blackboard, however, please do not rely entirely on slides, these are meant as a starting point for note-taking. Class notes and textbook information will form the basis of the material that will be on the exams. If you attend class regularly, you will be updated on the status of lecture notes and course material/announcements.
- Late Work Policy: No late work will be accepted unless the student receives written prior approval from the course instructor. Students should contact the course instructor via email with a request for late work.
- The only extra credit offered for this course is JEP. This is a semester-long commitment and you will receive extra credit in the class based on your performance in the program. JEP is the oldest and largest university service-learning program in the country. It offers students the unique opportunity to combine academic coursework with experiences in the community surrounding the campus. JEP assignments will be relevant to the course content and unique to HBIO 370. At the beginning of the semester, a JEP representative will visit our class and tell you more about the program. Deadline for registration is usually during the first two weeks of classes so make sure you register on time and notify the instructor. JEP assignments must be completed before the scheduled final examination. To register for JEP, visit <http://dornsife.usc.edu/joint-educational-project/>.

VIII. Academic Conduct

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, policy.usc.edu/scientific-misconduct.

Support Systems:

Student Health Counseling Services - (213) 740-7711 – 24/7 on call
engemannshc.usc.edu/counseling

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call
suicidepreventionlifeline.org

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-4900 – 24/7 on call
engemannshc.usc.edu/rsvp

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office of Equity and Diversity (OED) | Title IX - (213) 740-5086
equity.usc.edu, titleix.usc.edu

Information about how to get help or help a survivor of harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following protected characteristics: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations.

Bias Assessment Response and Support - (213) 740-2421
studentaffairs.usc.edu/bias-assessment-response-support

Avenue to report incidents of bias, hate crimes, and microaggressions for appropriate investigation and response.

The Office of Disability Services and Programs - (213) 740-0776
dsp.usc.edu

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

USC Support and Advocacy - (213) 821-4710
studentaffairs.usc.edu/ssa

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity at USC - (213) 740-2101
diversity.usc.edu

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call
dps.usc.edu, emergency.usc.edu

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call
dps.usc.edu

Non-emergency assistance or information.

