

USC Dornsife
College of Letters,
Arts and Sciences

**HBIO370 – Genetics and Diseases (4 units)
Spring 2020**

Lecture: Mon/Wed/Fri 11:00-11:50

Location: WPH 207

Lecture Instructor: Gioia Polidori, PhD

Office: AHF Jane Goodall Center, B40

Office Hours: Monday and Friday 2-4pm

Contact Info: gpolidor@usc.edu

Discussion Instructor: Linda Ding

Contact Info: lindadin@usc.edu

Discussion:

-Section number 38458D

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

Day Tuesday

Location SOS B48

--Section number 38459R

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

Day Thursday

Location PED B7

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)	1.5

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
Jan 13	Intro	
Jan 15	Molecular Basis of Inheritance I	2
Jan 17	Molecular Basis of Inheritance II	2
Jan 20	Martin Luther King Jr. Day	
Jan 22	Molecular Basis of Inheritance III	3
Jan 24	Patterns of Inheritance I	6

Jan 27	Patterns of Inheritance II	6
Jan 29	Patterns of Inheritance III	6
Jan 31	Genetic Techniques	4-5
Feb 3	Population Genetics	7
Feb 5	Genetic Problems	7
Feb 7	Risk Calculation	8
Feb 10	Pedigree Analysis & Risk Calculation	7-8
Feb 12	Genetics of Common Diseases	10
Feb 14	<i>Review</i>	
Feb 17	Presidents' Day	
Feb 19	Midterm I	
Feb 21	Debate preparation	
Feb 24	Diseases of Hemoglobin I	12
Feb 26	Diseases of Hemoglobin II	12
Feb 28	Diseases of Hemoglobin III	12
Mar 2	Diseases of Hemoglobin IV	12
Mar 4	Immunogenetics I	13
Mar 6	Immunogenetics II	13
Mar 9	Genetics of Cancer I	14
Mar 11	Genetics of Cancer II	14
Mar 13	Genetics of Cancer III	14
Mar 16-20	Spring Recess	
Mar 23	Personalized Medicine I	15
Mar 25	Personalized Medicine II	15
Mar 27	Inborn Errors of Metabolism I	18
Mar 30	Inborn Errors of Metabolism II	18
Apr 1	Review	9
Apr 3	Midterm II	16
Apr 6	Development	9
Apr 8	Congenital Abnormalities I	16
Apr 10	Congenital Abnormalities II	16
Apr 13	Congenital Abnormalities III	16
Apr 15	Congenital Abnormalities IV	16
Apr 17	Chromosome Disorders	17
Apr 20	Monogenic Disorders I	19
Apr 22	Monogenic Disorders II	19
Apr 24	Prenatal Testing I	20
Apr 27	Prenatal Testing II	20
Apr 29	Genetic Counseling	21
May 1	Review	

May 2-5	Study Days	
	FINAL EXAM: See schedule of classes	

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.