USC Dornsife College of Letters, Arts and Sciences

HBIO370 – Genetics and Diseases (4 units)
Spring 2018
Lecture: Mon/Wed/Fri 11:00-11:50
Location: VKC 211
Instructor: Gioia Polidori, PhD
Office: AHF Jane Goodall Center, B10-E
Office Hours: Tue 11:00 am AND by appointment
Contact Info: gpolidor@usc.edu

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
• To develop a deeper comprehension of the central and cross-disciplinary concepts of human biology, which include, but are not limited to human genetics, anatomy, physiology and pathology.
• To foster the students' process of identifying, exploring, assessing and solving real world problems through independent study and self-directed group work that solidify their understanding of the scientific method, and basic scientific principles.
• To obtain a core knowledge base in human molecular genetics that can be applied for the diagnosis and management of hereditary diseases.
•To develop the ability to think critically, analyze, synthesize, and use information to solve case studies and develop student-driven debates.
• To provide students with learning opportunities beyond the classroom including, but not limited to case studies, problem-based activities and debates.
•To place biological, genetic and physiological knowledge into an applicable and ethical context, especially how biology, physiology and genetics can contribute to the resolution of ethical, social and cultural issues.

IV. Description and Assessment of Assignments
• Class material will be evaluated via quizzes, case studies and exams.
• Problem-based learning activities will enatail 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	Points	% of Grade
Midterm 1	250	25
Midterm 2	250	25
Final Exam	250	25
Case Studies	150	15
Debate	50	5
Quizzes	50	5
TOTAL	**1000**	**100**
JEP (Extra Credit)	15	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 7	Intro	
Jan 9	Molecular Basis of Inheritance I	2
Jan 11	*Case Study: Introduction*	
Jan 14	Molecular Basis of Inheritance II	3
Jan 16	*Case Study 1: Karyotype Analysis*	
Jan 18	Patterns of Inheritance I	
Jan 21	**Martin Luther King Jr. Day**	6
Jan 23	Patterns of Inheritance II	6
Jan 25	Population Genetics	7
Jan 28	Risk Calculation	8
Jan 30	*Pedigree Analysis & Risk Calculation*	
Feb 1	*Case Study 2: Cystic Fibrosis*	
Feb 4	Genetics of Common Diseases	10
Feb 6	*Case Study 3: Alzheimer's*	
Feb 8	**Midterm I**	
Feb 11	Diseases of Hemoglobin I	12
Feb 13	Diseases of Hemoglobin II	12
Feb 15	*Case Study 4: Sickle Cell Anemia*	

Feb 18	**Presidents' Day**	
Feb 20	Immunogenetics	13
Feb 22	*Case Study 5: Celiac Disease*	
Feb 25	Genetics of Cancer I	14
Feb 27	Genetics of Cancer II	14
Mar 1	*Case Study 6: Chronic Myeloid Leukemia*	14
Mar 4	Personalized Medicine	15
Mar 6	*Case Study 7: Gene Therapy*	
Mar 8	Inborn Errors of Metabolism	18
Mar 11-15	**Spring Recess**	
Mar 18	*Case Study 8: Albinism*	
Mar 20	**Midterm II**	
Mar 22	*Debate Check in*	
Mar 25	Development	9
Mar 27	*Case Study 9: Achondroplasia*	
Mar 29	Congenital Abnormalities I	16
Apr 1	Congenital Abnormalities II	16
Apr 3	*Case Study 10: Neural Tube Defects*	
Apr 5	Chromosome Disorders	17
Apr 8	*Case Study 11: Sex Determination Disorder*	
Apr 10	Monogenic Disorders	19
Apr 12	*Case Study 12: Duchenne Muscular Dystrophy*	
Apr 15	Prenatal Testing	20
Apr 17	Genetic Counseling	21
Apr 19	Debate I	
Apr 22	Debate II	
Apr 24	Debate III	
Apr 26	Debate IV	
Apr 27-30	**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

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 Section 11, *Behavior Violating University Standards*https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct/.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity* http://equity.usc.edu/ or to the *Department of Public Safety* http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us. This is important for the safety whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. *The Center for Women and Men* http://www.usc.edu/student-affairs/cwm/ provides 24/7 confidential support, and the sexual assault resource center webpage sarc@usc.edu describes reporting options and other resources.

Support Systems

A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* http://dornsife.usc.edu/ali, which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html provides

certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* *http://emergency.usc.edu/*will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.