

BI305--Genetics and Genomics; Spring 2015 [Jan 2016-May 2016]; 3 credit hours

Division of Natural Sciences and Mathematics
Chaminade University of Honolulu

Meeting Time & Location: TR 3:30-4:50 HHOA 103

Instructors: Dr. Joan Kuh, Assistant Professor Biology, Wesselkamper Science Center 102; 739-4642; joan.kuh@chaminade.edu;

Office Hours: M 1:30-4 PM; W 3-5 PM or by appointment

Dr. Gwenevere Anderson, Dean, Chaminade School of Nursing, Henry Hall;
739-8347; gwenevere.anderson@chaminade.edu ;

Office Hours: by appointment

Course Description:

This course is intended to provide training in the basic concepts of genetics and genomics and their applications in human medical practices to third year nursing students in the Chaminade School of Nursing. Topics that include personalized medicine, gene therapy and family histories of genetic diseases will be covered. A service learning component is included to expose students to organizations that assist and counsel patients with defined genetic disorders such as muscular dystrophy and chromosomal aneuploidies such as Down Syndrome as well as congenital birth defects. Topics include family history, risk assessment, interventions, genetic testing and counseling, ethical and social issues and use of genetics and genomics to improve clinical practice. *Prerequisites: BI 152/BI 152L, CH 254/CH 254L, NUR 202, NUR 203.*

Course Learning Outcomes:

At the conclusion of the BI305 course, students will demonstrate the ability to

1. Define basic genetic terminology.
2. Describe the basic genetic information and its relationship to genes, phenotypes and mutations.
3. Construct and analyze pedigrees, e.g. family genetic histories, from information collected over a minimum of three generations.*
4. Ascertain patterns of inheritance in pedigrees of human traits that result from pure Mendelian laws as well as factors that can skew Mendelian ratios including phenomena such as multifactorial traits, epigenetics, penetrance and variable expressivity.
5. Write up case studies that incorporate genetics and genomics into health and disease assessments. *
6. Calculate simple genetic risk assessments and make recommendations. *
7. Diagram the composition and organization of the genetic material in the human genome.
8. Identify resources that provide genetic and genomic information including services such as genetic testing. *
9. Describe basic cytological and molecular genetic tests for the major genetic disorders.
10. Explain the concept of personalized medicine particularly as it applies to pharmacogenomics and cancer and gene therapies. *
11. Synthesize the ethical, legal and social issues in the area of genetics and genomics in the context of human health.

*Essential Nursing Competencies Guidelines for Genetics and Genomics, 2008.

Text: *Genetics and Genomics in Nursing and Health Care.* Theresa Beery and M. Linda Workman. F.A. Davis publishers.

Resources: The ecollege tool will be used extensively in this course to post assignments and supplemental readings. Grades will be posted at this site as materials are graded. Supplemental readings will have material that will be on exams and quizzes.

Tutors will be available for this course at the Student Services Center. I will relay more information about these student tutors during the first week of class.

Grading: 90-100% A; 80-89% (B); 70-79% (C); 60-69% (D); < 60% F.
Your grade will be based on the following items:

Grading Component	Number	Points	% Total
IN-CLASS QUIZZES	12@10 PTS	120	20%
CASE STUDIES	3@20 PTS	60	10%
HOMEWORKS	3@20 PTS	60	10%
CLASS PARTICIPATION	6@10 PTS	60	10%
SERVICE LEARNING	1@50 PTS	50	8%
MIDTERM	1@100 PTS	100	17%
FINAL	1@130 PTS	150	25%
TOTAL		600	100%

Description of assignments:

In-Class Quizzes--- WEEKLY quizzes will be given *in class* on Thursday's class during the last 20 minutes. Quizzes will be on that week's materials, including material presented earlier in class. A total of thirteen quizzes will be given and students will be able to drop one quiz. THERE ARE NO MAKE-UP QUIZZES.

Case Study—there will be a total of 3 case studies assigned in this course.

Homeworks --- There will be three homework assignments during the course of the semester. These are to be submitted in class on the due date specified on the syllabus.

Service Learning --- Students will be required to volunteer 10 hours during the semester for an organization or in an activity that is related to human genetics. A 2-3 page reflection paper will be due during Week 14 on the activities. More information on the opportunities will be provided in the first few weeks of class. Service Learning papers are due by April 26. If you complete the service earlier in the semester, you are encouraged to submit the paper earlier in the semester, as in within two weeks of completing the service.

Exams --- A midterm and a final exam will be given during the semester. They will consist of multiple choice and other objective type questions as well as short answers, problems involving calculations and a case study.

Class Participation --- This portion of your grade will be derived from UNANNOUNCED activities in class. You **MUST** be present in class to earn these points with one exception. One "class participation" activity is to visit Dr. Kuh during her office hours once during the semester. Only one class participation activity will apply and the visit must be at least 5 minutes in length. Make an appointment if you are not able to make it to my regular office hours.

Other important policies:

Attendance: Students are expected to attend all classes and attendance will be taken. The classroom is a teaching and learning environment where there is an exchange of knowledge and

experience, so it is essential that students attend class and participate in classroom activities to maximize individual learning. Each student will be encouraged to develop professional accountability based on entrance into the nursing field with a work ethic that reflects personal responsibility, initiative, and teamwork. Students should notify the instructor by phone or e-mail when illness prevents them from attending class and make arrangements to complete missed assignments. Any student who stops attending class without officially withdrawing may receive a failing grade. Unexcused absences equivalent to more than a week of class may lead to a grade reduction for the course. Any absence of two weeks or more must be reported to the Associate Provost and the Records Office by the instructor.

Academic Conduct: Please refer to and follow all policies and procedures included in the Student Handbook (available in hard copy and online) and carefully read all areas. Please pay attention to the sections that discuss plagiarism, classroom respect, student conduct, freedom of speech, and all academic policies regarding grading.

Assignments: It is expected that assignments will be handed in on time. Late papers will receive a 10% point deduction for each day beyond the due date. For in class activities, you will not receive points for that activity if you are absent.

Writing policy: All papers should demonstrate mastery of grammar, punctuation, spelling and syntax expected of college level students. Use of APA is required for all papers, if assigned. If you need writing assistance, please seek help from Student Support Services and the Academic Achievement Program. All papers are to be word processed, proofread, and solely the work of the author.

Testing policy: Students are expected to take tests on the designated day. In case of an emergency, please contact the instructor prior to the test so that an alternate plan can be made. Failure to do so will result in a zero. Approval for taking a make-up test must be granted by the instructor. Students are required to take the final exam as designated. Do not make any travel plans as there will no makeup for this reason and students will receive a 0 in the exam.

Disability information: ADA Accommodations: Students with special needs who meet criteria for the Americans with Disabilities Act (ADA) provisions must provide written documentation of the need for accommodations from the CUH Counseling Center (Dr. June Yasuhara; phone 735 4845) by the end of week three of the class, in order for the instructor to plan accordingly. Failure to provide written documentation will prevent your instructor from making the necessary accommodations. Please refer any questions to the Dean of Students and review the procedures at http://www.chaminade.edu/student_life/sss/counseling_services.php.

Cell phones and other electronic devices: Use of music devices and cell phones are prohibited unless specifically approved by the instructor. Use of these devices is discourteous and may lead to suspicion of academic misconduct. Students who cannot comply with this rule will be asked to leave class and will receive a zero for any activities completed that day in class.

Tentative Schedule*

Week	Dates	Topic	Reading	Supplemental Reading	Assignments/Quizzes
1	Jan 12 & 14	Intro; DNA Structure & Function; DNA to Protein	1, 2 Appendices		
2	Jan 19 & 21	DNA to Protein;	2		Q1
3	Jan 26 & 28	Cell Division; Mendel & genes Patterns of Inheritance	3,4		Q2 HW1 due Jan 26
4	Feb 02 & 04	Patterns of Inheritance; Chromosomes	4, 5	<i>Cystic fibrosis genetics: from molecular understanding to clinical application, NatRevGen 2015</i>	Q3 Case Study 1
5	Feb 09 & 11	Family History & Pedigree Construction	6		Q4
6	Feb 16 & 18	Intro to Probability & Risk; Childhood Onset Disorders;	9		Q5 HW2 due Feb 16
7	Feb 23 & 25	Complex Disorders; Adult Onset Disorders	10	<i>An Overview of the Metabolic Syndrome, JoNS 2013</i>	Q6 Case Study 2
8	Mar 01 & 03	PopGen, Carrier Screening & Genetic Risk	18		Q7
9	Mar 08 & 10	Genetic & Genomic Testing; MIDTERM	14	<i>MIDTERM 1 on March 10; all materials through Mar 03</i>	
10	Mar 15 & 17	Genetic & Genomic Testing, Cancer Genetics	12		Q8
SPRING BREAK –Monday – Friday Mar 21-25.					
11	Mar 29 & 31	Cancer Genetics & Genetic Risk	12		Q9
12	Apr 05 & 07	CVD Disorders; Psychiatric Disorders	11, 13		Q10 HW3 due Apr 05
13	Apr 12 & 14	Pharmacogenetics	15		Q11
14	Apr 19 & 21	Ethics and policies in nursing	17		Q12 Service Learning Papers due Apr 26
15	Apr 26 & 28	Alzheimer Case Study; Wrap up	17		Q13 Case Study 3
16	Week of May 02	FINAL EXAM TBA			