BI307 Syllabus

Meeting times:

Section 2: 11:30 AM - 12:50 PM, Tues & Thurs → Henry Hall Room 104

Instructor: Michael Dohm, PhD
Office: Henry Hall 6; **Phone**: 739-8543
Office hours: Monday & Friday, 12:00-2:00PM; By appointment
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Course description

Genetics is a one semester introduction to the study of genes (the unit of heredity) and inheritance in biological organisms. Our focus will include patterns of inheritance (heritability, mutation), the relationship between genes, gene expression, environment, and phenotypes, molecular genetics (gene structure), biotechnology, and the genetics of cancer and regulation of the cell cycle. BI307 is intended to provide a firm foundation of genetic principles and analysis; BI308 continues your genetics education with a focus on genomics. Interestingly, most of the technology now in use to study genes and genomes are based on just two fundamental principles of molecular biology: (1) the hydrogen bonding of complementary nucleotide sequences and (2) interactions between specific proteins with specific nucleotide sequences. Application of these two principles will appear throughout the course. Since the late 1980s, the discipline of genetics has witnessed a revolution in methods and discovery. The impact of this revolution can be seen in the food we purchase, the way our diseases are treated, and perhaps even how we view ourselves. Through lecture and discussion, we will explore these topics and reflect upon how the technology and resources of modern genetics influences the environment and human society.

> *Catalog description (2015 - 2016 catalog):* **BI 307 Molecular Biology I– Genes and Genetics (3)** *Life cycles and meiosis. Mendelian inheritance. Population genetics. Chromosomal and molecular basis of inheritance. Flow of genetic information. Determining structure and function of genes. Mutation and DNA repair systems. Genetic basis of disease, DNA technology. Prerequisites: BI 210L, BI 216 and BI 216L.*

Learning outcomes

On completion of this course, students will be expected to:

1. Describe and demonstrate comprehension of transmission genetics and role of probability: Inheritance patterns and chromosomal basis of heredity.
2. Identify and apply concepts of chance and transmission genetics to examples of the human condition.
3. Identify landmark discoveries in genetics and molecular biology.
4. Identify and explain DNA, RNA, and protein structure and the “Central Dogma” of molecular biology.
5. Identify, distinguish, and evaluate the relationships between gene as construct of particulate inheritance, gene as structure, and the gene as information.Identify, distinguish, and evaluate how mutations, gene flow, nonrandom mating, genetic drift, and natural selection affect the genetics structure of populations.
6. Describe and analyze how chemical properties of DNA and the interactions of proteins are utilized by scientists to study and manipulate genes and phenotypes.

Biology Program outcome

This course will introduce students to the essential concepts of Mendelian inheritance, molecular genetics, population & evolutionary genetics, and biotechnology. Students will enhance abilities to discuss potential benefits and risks of genetic technology to the environment and or to human health and society.

Required Text(s)

The required text for this course is *Concepts of Genetics* 11th ed., 2015, by Klug et al., ISBN: 978032194815. This is a new textbook for BI307. Previous editions (e.g., 10th) would likely be acceptable (ISBN: 9780321724120). However, all suggested reading and homework will be from the 11th edition. Access to Pearson's online web site is not required, but highly recommended as a study aid. Both the 11th and 10th editions are available in several formats including a Kindle version. To rent a digital version of your textbook go to http://www.coursesmart.com/IR/1471192/9780321857415?__hdv=6.8

Recommended, but not required textbooks include *Introduction to Genetic Analysis*, 9th ed., 2008, by Griffiths et al., ISBN: 0716768879, *Lewin's Essential Genes*, by Krebs et al., ISBN: 1449644791, *Advanced Genetic Analysis*, 2009, by Meneely, ISBN: 9780199219827, and *Introduction to Genomics 2nd ed.*, 2012, by Lesk ISBN: 9780199564354. Note: the Klug et al book and Lesk's book are also required for BI308.

There will be additional readings, both suggested and required, throughout the course.

Course elements

Lectures

This course is web-enhanced. All lecture slides, course handouts, including the syllabus, will be made available through our Moodle site. Quizzes typically will also be handled via the Moodle site. Other arrangements for taking quizzes may be available upon request.

You may access the Moodle site directly at http:/www.letgen.org/chaminade. Select BI307 Genetics Lecture from the welcome screen and logon to the course. Logon and password will be provided to you by e-mail or in class during first week of the semester; at your first logon to the site you will be prompted to change your password.

Assignments

Your grade will be the result of points earned from quizzes and exams. The instructor will suggest relevant homework from your textbook problem and discussion questions. Homework will not be graded.

Quizzes are multiple-choice or one word-answer format and will be taken online via the course Moodle website. Quizzes are scheduled outside of scheduled class time. Quizzes will be available for a minimum of 24-48 hours to access and complete the assignment. You have the right to take any or all quizzes by paper; you would then take the quiz as part of an arranged proctored session outside of regular class hours but before the due date for the quiz. There are a total of twelve (12) quizzes; all count to the final grade.

Exams, including the final, comprise between 10 and 20 questions (approximately 30% multiple choice, 70% short answer format). Each of the mid-term exams will have opportunities for bonus points (10% per exam); there are no bonus points possible for the Final.

Grading

A total of 500 points may be earned throughout the semester; each item has the following value.

Item	How many?	How often?	How many points?	Total points towards final grade
Quizzes	12	Every 1-2 weeks	5	60
Exams	4	Every 3-4 weeks	80	320
Cumulative Final	1	Wed 10 December	120	120

Final grade

Your letter grade will be based on the following point distribution out of 500 points possible.

Points earned	Percent (%) of total	Interpretation of scores (from Undergraduate Catalog 2015-2016, p. 26)	Letter grade
450 – 500	90 – 100%	Outstanding scholarship and an unusual degree of intellectual initiative	A
400 – 449	80 – 89%	Superior work done in a consistent and intellectual manner	B
350 – 399	70 – 79%	Average grade indicating a competent grasp of subject matter	C
300 – 349	60 – 69%	Inferior work of the lowest passing grade, not satisfactory for fulfillment of prerequisite course work	D
< 299	< 60%	Failed to grasp the minimum subject matter; no credit given	F

Policy reminders and notices

1. Macbook lab use. This computer classroom was designed and is now maintained by Chaminade's Department of Information Technology and the Division of Natural Sciences and Mathematics so that you would have access to a state-of-the art academic computing environment. Money is simply not available to repair abused or stolen computers. Therefore, each person has the responsibility to use the computers responsibly. By using these facilities, you agree to abide by the Computer Room Policies posted in the classroom. These rules include, but are not limited to *No food or drink *You agree to adhere to the account setup procedures and use restrictions *No alterations of software or hardware configurations *No use of the computers for personal or commercial activities, (except where such activities are otherwise permitted or authorized under applicable University policies).
2. Attendance and tardiness. Students are expected to attend regularly all courses for which they are registered. Students should notify their instructors when illness or other extenuating circumstances prevents them from attending class and make arrangements to complete missed assignments. Notification may be done by sending a text message from within the course Moodle site. Other modes include emailing the instructor’s Chaminade email address, calling the instructor’s campus extension or by leaving a message with the instructor’s division office (Natural Science and Math 1 (808) 440-4204). It is the instructor’s prerogative to modify deadlines of course requirements accordingly. Any student who stops attending a course without officially withdrawing may receive a failing grade. Class begins and ends each time exactly on the scheduled start time. Unexcused absences equivalent to more than a week of classes may lead to a grade reduction for the course. Any unexcused absence of two consecutive weeks or more may result in being withdrawn from the course by the instructor, although the instructor is not required to withdraw students in that scenario. Repeated absences put students at

risk of failing grades. Regular attendance is expected and essential for your progress in this class. The goal of lecture and discussion will be to provide the needed context to remove barriers to your understanding of the material. We will be using a statistics software package (R) that will be intimidating at first -- going it alone is not recommended.

3. Policy on communication. The University provides a Chaminade email address for all students. Official Chaminade communications will be sent to the students' Chaminade email address and instructors will use only this email to communicate with students. It is the responsibility of the student to check their email frequently. Report email-related problems to the Helpdesk at 808-735-4855 or helpdesk@chaminade.edu.
4. Electronic devices. Use of music devices and cell phones is prohibited during all Natural Science and Mathematics classes at Chaminade, unless specifically permitted by your instructor. Use of cellphones and music devices in laboratories is a safety issue. In addition, use of cellphones and music devices in any class is discourteous and may lead to suspicion of academic misconduct. Students who cannot comply with this rule will be asked to leave class and may be subject to laboratory safety violation fines. Please refer any questions to the Dean of Natural Sciences and Mathematics. BI311 Electronic devices policy: You are encouraged to bring and use your laptops and tablets to Biostatistics lecture and workshops. Calculators will be provided for your use on Exam days. Cell phone use as calculators is not permitted while taking exams.
5. Getting help in this course. Please utilize the Ask Dr Dohm forum. Most of the questions you have about biostatistics, others will have too. It is important and an expectation of the course that you participate and regular use of the forum is a great way to accomplish this. You are also encouraged to learn how to askmy official office hours or make an appointment via the Moodle site if you wish to discuss biostatistics.
6. Policy on make-up assignments. No make up quiz, exam, or presentation time will be granted for unexcused absences. For excused absences, if a student cannot attend a class in which a quiz has been scheduled, the student must provide written verification of the need to miss class at least one day prior to the scheduled due date. This includes any activities sponsored by Chaminade (athletics, etc.) -- it is the responsibility of the student to adhere to this policy. In the event of illness, a Doctor's note will be expected.
7. Academic honesty. You are encouraged to work together; however, all graded material must be your own. Cheating in the form of plagiarism, collusion, deception and will not be tolerated and will negatively affect your grade. You are also expected to have read and to abide by the "Student Rules of Conduct" which are available in your copy of Chaminade University's Student Handbook.
8. ADAA Statement. Pursuant to several federal and state laws, including the Americans with Disabilities Act of 1990, as amended by the ADA Amendments Act of 2008, and Section 504 of the Rehabilitation Act of 1973, all qualified students with disabilities are protected from discrimination on basis of disability and are eligible for reasonable accommodations or modifications in the academic environment to enable them to enjoy equal access to academic programs, services, or activities. If a student would like to determine if they meet the criteria for accommodations, they should contact the Counseling Center at 808-735-4845 for further information.
9. Title IX Declaration. Chaminade University of Honolulu recognizes the inherent dignity of all individuals and promotes respect for all people. Sexual misconduct, physical and/or psychological abuse will NOT be tolerated at CUH. If you have been the victim of sexual misconduct, physical and/or psychological abuse, we encourage you to report this matter promptly. As a faculty member, I am interested in promoting a safe and healthy environment, and should I learn of any sexual

misconduct, physical and/or psychological abuse, I must report the matter to the Title IX Coordinator. Should you want to speak to a confidential source you may contact the following:

• Chaminade Counseling Center| 808 735-4845.

• Any priest serving as a sacramental confessor or any ordained religious leader serving in the sacred confidence role.

10. The instructor may modify elements of this syllabus or schedule according to the operational needs of the class.

BI307 Tentative lecture and assignment schedule

August	***October***
25th Tuesday, Pretest, Chapter 1 – 2, Quiz00 opens	20th Tuesday, Chapter 8 & 15; Quiz08 opens
27th Thursday, Chapter 2 & 3	22nd Thursday, Chapter 15
September	27th Tuesday, Chapter 15; Quiz09 opens
1st Tuesday, Chapter 3 & 4; Quiz01 opens	29th Thursday, Review
3rd Thursday, Chapter 5; Quiz02 opens	***November***
8th Tuesday, Chapter 5; Qui03 opens	3rd Tuesday, **Exam03** in class
10th Thursday, Review	5th Thursday, Chapter 20 & 22
15th Tuesday, **Exam01** in class	10th Tuesday, Chapter 20 & 22; Quiz10 opens
17th Thursday, Chapter 7; Quiz04 opens	12th Thursday, Chapter 23
22nd Tuesday, Chapter 10	17th Tuesday, Chapter 23 & 25; Quiz11 opens
24th Thursday, Chapter 11; Quiz05 opens	19th Thursday, Chapter 25
30th Tuesday, Chapter 13; Quiz06 opens	24th Tuesday, Chapter 25; **Exam04** takehome assigned
October	26th Thanksgiving break, no class
1st Thursday, Review	December
6th Tuesday, **Exam02** in class	1st Tuesday, Takehome Exam04 due; Coruse wrapup
8th Thursday, Chapter 13	3rd Thursday, Cumulative final review
13th Tuesday, Chapter 14	5th Saturday – Optional review session
15th Thursday, Chapter 14; Quiz07 opens	9th Wednesday, **Final Exam** 8:30 – 10:30 AM