BI 307, 3 credits

Molecular Biology I – Genes and Genetics

Section: BI307-02
Meeting days/times: Tues, Thurs 11:30 AM – 12:50 PM
Location: CTCC Room 254
Instructor: Michael Dohm, PhD
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Office hours: (1) Monday & Friday, 12:00-2:00PM; (2) By appointment

The required text for this course is *Essentials of Genetics* 8th ed., 2013, by Klug et al., ISBN: 9780321803115. The previous edition (7th) was used as recently as last year ISBN: 9780321618696, however, problem sets will be assigned from the 8th edition. Access to Pearson's online web site is not required, but highly recommended as a study aid. The 8th edition is 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 *Genomes 3*, 2006, by Brown ISBN: 0815341385. Note: the Klug et al book and Brown's Genome 3 are also required for BI308.

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

Access to course website

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 although 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.

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.

Program outcome

This course will introduce students to the foundational concepts of Mendelian inheritance, molecular 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.

Student learning outcomes

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

1. Demonstrate comprehension of transmission genetics and role of probability: Inheritance patterns and chromosomal basis of heredity.
2. Apply concepts of chance and transmission genetics to examples of the human condition.
3. Identify landmark discoveries in genetics and molecular biology.
4. Summarize and explain DNA, RNA, and protein structure and the “Central Dogma” of molecular biology.
5. Evaluate the relationships between gene as construct of particulate inheritance, gene as structure, and the gene as information.
6. Explain how chemical properties of DNA and the interactions of proteins are utilized by scientists to study and manipulate genes and phenotypes.

Course prerequisites

Required courses: BI205/205L and BI206/206L.

Course assessment

Your grade will be the result of points earned from quizzes and exams. Graded elements include: up to twelve (12) quizzes; four (4) mid-term exams; plus a cumulative final exam.

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. However, once you start, you are permitted 50 minutes to complete and submit the quiz. 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. The advantage of taking the quizzes online is that it permits

rapid grading and immediate feedback – because the quizzes are predominately multiple choice, you will receive immediate feed-back once the quiz closes. The quizzes are open-book, open-notes; however, you are strongly encouraged to avoid the temptation to complete the quizzes simply by looking through your text and notes for answers. First, you will likely run out of time. Second, the quizzes are intended to demonstrate your current understanding of the material. 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.

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	Letter grade
450 – 500	90 – 100%	A
400 – 449	80 – 89%	B
350 – 399	70 – 79%	C
300 – 349	60 – 69%	D
< 299	< 60%	F

Course and University Policy, Reminders, and notices

1. Chaminade University abides by all aspects of the Family Educational Rights and Privacy Act (FERPA) . Details of Chaminade's implementation of FERPA are available in your Student Handbook.
2. Success in this class is in your control. The more you do, the better the results will be for you. You are expected to attend class and to come prepared: read your text before the material is to be presented in class; preview the lecture slides available on the course web site; use the web site forum to ask questions and to discuss concepts; ask questions in class if you are unsure of

material. I will suggest problems or questions from each chapter in your text or from the publisher's website for you to consider. If you have purchased access to Pearson's online content that accompanies your text book, please do take advantage of this marvelous resource. Neither the suggested problem sets nor the work on Pearson's supplemental material will be graded, nor are they required. However, the more you do, the more practice and exposure you get to the material, the better you will do on my exams. BI307 exams are based on the same concepts and problems that the text questions address.

3. Use of music devices and cell phones is prohibited during all Natural Science and Mathematics classes at Chaminade, unless specifically permitted by your instructor (see item 4 below for Genetics-specific exemptions to technology policy restrictions). 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.

4. You are encouraged to bring your PDA, tablets or laptops to class provided these tools are used in support of our engaged learning environment on Genetics lecture days. You are encouraged to view lecture slides from within the course website. However, on Exam days no laptops, tablets, or cell phones will be permitted. Calculators may be necessary for Exam 1 and the Cumulative Final. Note that the exam-day prohibition of electronic devices other than approved calculators applies to any calculator application on PDA, cell phone, etc.
5. Return of graded paper material will be within ten business days after you take the graded assignment. Online quizzes typically are graded within three days or less.
6. Grades will be made available for you to view within the secured web site for the course, however, this access is a courtesy and does not constitute the official grade book for the course.
7. You are 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 . You may not share user accounts or passwords to the course website.

8. Students with special needs who meet criteria for the provisions of Americans with Disabilities Act Amendments Act of 2008 (ADAAA) 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

Lecture schedule

Every attempt has been made to create an accurate pathway through the material. However, the instructor reserves the right to alter this schedule as appropriate to correct any error, or based on our progress and in the event of unforeseen events which may affect our work with the material. Therefore, be advised that you are expected to check for the updated schedule on a regular basis throughout the course.

Readings are from 8th edition of *Essentials of Genetics* by Klug, Cumming, Spencer, Falladino.

Week	Day	Item1	Item2	Item3	Graded Item	Notes
1	Tue, Aug 26	Pretest	Chapter01	Chapter02		
	Thu, Aug 28	Chapter02	Chapter03		Quiz00	Due 12PM 9/1
2	Tue, Sep 2	Chapter03	Chapter04		Quiz01	Due 12PM 9/4
	Thu, Sep 4	Chapter05	Chapter07		Quiz02	Due 12PM 9/9
3	Tue, Sep 9	Chapter07			Quiz03	Due 12PM 9/11
	Thu, Sep 11	Review01				
4	Tue, Sep 16	**Exam01**				Inclass
	Thu, Sep 18	Chapter09				
5	Tue, Sep 23	Chapter09	Chapter10			
	Thu, Sep 25	Chapter10			Quiz04	Due 12PM 9/29
6	Tue, Sep 30	Chapter10	Chapter11		Quiz05	Due 12PM 10/2
	Thu, Oct 2	Chapter11			Quiz06	Due 12PM 10/6
7	Tue, Oct 7	Review02				
	Thu, Oct 9	**Exam02**				Inclass
8	Tue, Oct 14	Chapter12				
	Thu, Oct 16	Chapter12	Chapter13		Quiz07	Due 12PM 10/20
9	Tue, Oct 21	Chapter13	Chapter14		Quiz08	Due 12PM 10/23
	Thu, Oct 23	Chapter14				
10	Tue, Oct 28	Chapter14			Quiz09	Due 12PM 10/29
	Thu, Oct 30	Review03				
11	Tue, Nov 4	**Exam03**				Inclass
	Thu, Nov 6	Chapter17				
12	Tue, Nov 11	Holiday			Quiz10	Due 12PM 11/13
	Thu, Nov 13	Chapter22				
13	Tue, Nov 18	Chapter22			Quiz11	Due 12PM 11/20
	Thu, Nov 20	Chapter23			Quiz12	Due 12PM 11/25
14	Tue, Nov 25	Review04				
	Thu, Nov 27	Holiday				
15	Tue, Dec 2	**Exam04**				Inclass
	Thu, Dec 4	Final review				

Final Exam 8:30am - 10:30am Wed, Dec 10