BI308 Syllabus

Spring 2016 meeting days/times:

Section 1: MWF 10:30 – 11:20 AM, Hale Hoaloha, room 102

Section 2: MWF 1:30 – 2:20 PM, Hale Hoaloha, room 102

Instructor: Dr Mike Dohm, **Office**: Henry Hall, room 6; **Phone**: 808-739-8543

Office hours: Use Ask Dr Dohm forum; in person on Tuesday 9 – 11AM, and 1 – 2 PM; By appointment

Required textbook(s):

Introduction to Genomics, 2nd ed., 2012, by Arthur Lesk (ISBN: 978-0199564354); *Concepts of Genetics*, 11th edition, by Klug et al. (ISBN: 978-0-321-94891-5; There will be additional readings provided by the instructor throughout the course.

Recommended textbook(s):

Genomes 3, 2006, by T. A. Brown (ISBN: 978-0815341383); *Genome: The autobiography of a species in 23 chapters*, by Matt Ridley (ISBN: 978-0060894085)

Access to course website:

BI308 Genetics & Epigenetics is a web-enhanced course. 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 are available to the student upon request.

You may access the Moodle site directly at http:/www.letgen.org/chaminade. Select BI308 Genomics & Epigenetics 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.

The website is maintained by Dr Dohm is not affiliated nor supported by Chaminade Information technology. You are not required to use the site; it is there for your convenience and to support your learning and my teaching of the course. All questions about the site are to be directed to Dr Dohm.

Course description:

Genomics & Epigenetics is a one semester introduction to the study of genomes (the entirety of an organism's heredity information) and epigenetics, the heritable changes in gene expression as a result of changes other than DNA sequence alterations in biological organisms. Since the late 1990s, the discipline of genomics 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 diagnosed, and perhaps even how we view ourselves.

Through lecture and discussion, we will explore these topics and reflect upon how the technology and discovery in genomics impacts the environment and human society. We will discuss genome structure and how to locate elements like a specific gene to a particular region of the genome, incorporating use of new technologies like genome wide mutant screens and RNA interference, and non-Mendelian inheritance as a

result of epigenetic changes to DNA. Students will be introduced and gain experience with software tools to interrogate genomic data.

Course learning outcomes:

This course will introduce students to the foundational concepts of molecular genetics, genomics, and bioinformatics. 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:

Students will be expected to demonstrate an understanding of

1. Organization of genomes.
2. How sequencing technologies, software, and prior knowledge is incorporated into a genome assembly.
3. How to locate a gene (or other element) by molecular genetic and bioinformatic approaches.
4. Local and genomic control of gene expression.
5. The role of sequence and imprinting on allele-specific patterns of inheritance.

Course prerequisites:

Required courses: BI207/307.

Course assessment:

Your grade will be the result of points earned from worksheets and exams.

Quizzes and Worksheets, hereafter simply referred to as Quizzes, consist of testing of concepts (multiple choice) and from case studies with instructions on a particular genomics or bioinformatics problem. Work will include: use of online databases and bioinformatics tools and will be supported by work in laboratory exercises.

Three “midterm” exams, each based on 8-9 lectures from up to five chapters from the lectures, quizzes, worksheets and required textbook. Exams will include between 15 and 20 questions (approximately 30% multiple choice, 50% short answer format; 20% “essay”). Each exam is cumulative – that is, Exam 2 will include concepts and terms discussed prior to Exam 1, and so forth, leading up the fourth and Final Exam, which is cumulative over the entire semester. All exams are given equal weight

Each exam will include opportunities for bonus points (10% per exam). Bonus is earned for correctly defining terms selected by the instructor. Additional bonus points may be earned from answering questions I post on the Ask Dr Dohm Forum.

A total of 400 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 and Worksheets	*8*	*every 1-2 weeks*	*2.5*	*20*
Exams	*4*	*every 3-4 weeks*	*95*	*380*

Final grade:

Your letter grade will be based on the following point distribution out of 400 points possible.

Points earned	*Percent of total*	*Letter grade*
360-400	*90-100%*	*A*
320-359	*80-89%*	*B*
280-319	*70-79%*	*C*
240-279	*60-69%*	*D*
239 or fewer	*< 60%*	*F*

Course and University Policy, Reminders, and Notices:

1. **Class begins each time exactly at the time scheduled (check your section number) – please be on time**. Chronic tardiness will be viewed as absence from class. If you miss or are tardy for class, please note that we will proceed without you and you will miss material; I cannot re-teach the class -- it is your responsibility to obtain missed lecture topics from your classmates who were in attendance.
2. There are two sections of BI308; **On Exam days, please attend the section you registered for**. However, if space is available, you may, with permission from the instructor, attend a different section to make up any missed lecture.
3. **You are expected to attend class and to come prepared**: Read assigned and suggested readings before the material is to be presented in class; Do ask questions if you are unsure of material: I highly recommend that you ask in class or via the course forum.
4. **Do more than the minimum required!** I will suggest problems or questions from each chapter in your text or from the publisher's website for you to consider; these will not 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. BI308 exams are based on the same concepts and problems that the text questions address. We can discuss answers, but only after you have attempted and submitted your work. I do not post answers to these suggested problems; however, I encourage you to discuss them with me in class or via the course forum.
5. **If a student cannot attend a class in which an exam has been scheduled, the student must notify the instructor in person no later than the class prior to the scheduled exam**. Notification does not include phone calls or by email. Student athletes need to provide the instructor with a schedule of all travel during the semester, in addition to providing a letter from the Athletics Department prior to travel. In the event of an emergency or an illness, a Doctor’s note will be expected and accommodations will be made on a case-by-case basis. Lacking an authorized excuse, you may still be allowed to take the exam at a later time, but you will not be able to earn full credit for the assignment, in fairness to those students who took the exam on time. Same day, but at later time: maximum points possible 95% one day late: maximum points possible 85% two to three days late: maximum points possible 70% More than three days, you will not be permitted to take the exam and a score of “0” will be assigned.
6. **Return of graded material will generally be within 5-7 class days after you take the graded assignment**.
7. **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.

8. **You may not record by camera or video or audio recording device any lecture or other class activity without prior permission from the instructor.**
9. **I encourage you to bring and use your laptops and tablets in class**. However, use of these devices is conditional -- nonacademic activity during class hours is disruptive to the class and everyone around. Mute the sound and avoid "low-battery" emergencies -- electrical outlets are generally not available for student use during class hours.
10. Chaminade University recognizes the inherent dignity of all individuals and promotes respect for all people. Sexual misconduct will NOT be tolerated at Chaminade. If you have been the victim of sexual misconduct, 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, I must report the matter to the Title IX Coordinator. **Should you want to report to a confidential source you may contact the following:**
    - Counseling Center (Dr. June Yasuhara; phone 808-735-4845).
    - Any priest serving as a sacramental confessor or any ordained religious leader serving in the sacred confidence role (Fr. George Cerniglia, Rector; phone 808-739-8399 or Campus Ministry; 808-735-4774).
11. **Chaminade University abides by all aspects of the Family Educational Rights and Privacy Act (FERPA)**. FERPA is a Federal law that protects the privacy of student education records. Details of Chaminade's implementation of FERPA are available beginning on page 12 in your 2014 - 2015 Chaminade University Student Handbook and Academic Planner.
12. Chaminade University is committed to making reasonable accommodations to assist individuals with disabilities in reaching their academic potential (**Americans with Disabilities Act**). **If you have a disability which may impact your performance, attendance, or grades in this course and require accommodations, you must first must obtain written documentation of the need for accommodations from the Chaminade University Counseling Center** (Dr. June Yasuhara; phone 808-735-4845) as soon as possible 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.
13. **You are also expected to have read and to abide by the "Student Rules of Conduct" (p. 25 - 29) 2014 - 2015 Chaminade University's Student Handbook and Academic Planner**. The handbook is available from the Bookstore or online at http://www.chaminade.edu/student_life/handbook.php. Please note standards of academic honesty expected of you. If you are unsure what your responsibilities are, please ask and I will be happy to help you or get you contact information if I cannot help.

BI308 Lectures, Readings, Quiz, & Exam Schedule; may change at discretion of instructor

Weeks 1 – 4: Introduction (Lesk C1); Genomes are the hub of biology (Lesk C2); Gene expression (Klug C16 & C17; Lesk C9) No class 18 January Quiz00 = 1/13 (not counted for grade) Quiz01 = 1/20 Quiz02 = 1/27 Quiz03 = 2/1 Exam01 in class 5 February	Weeks 9 – 10, 12 – 13 Genomes of Prokaryotes & Viruses (Lesk C6; Klug C6 & C12); Genomes of Eukaryotes (Lesk C7; Klug C8, C12, C15) & Humans (Ch08) No class 15 February Week 11: Spring Break Quiz07 = 3/18 Quiz08 = 4/6 Exam03 in class 15 April
Weeks 5 – 8: Genome mapping, sequencing, annotation (Lesk C3; Klug 5, 21); Comparative genomics (Lesk C4; Klug C21); Evolution & Genome Change (Lesk C5; Klug C23) Quiz04 = 2/12 Quiz05 = 2/24 Quiz06 = 3/2 Exam02 in class 11 March	Weeks 14 – 15: Review; Special topics (e.g., genomics & cancer); instructor assigned readings Finals Week: Exam04 BI308-02 – 3 May 11:00AM – 1:00PM BI308-01 – 5 May 11:00AM – 1:00PM

/MD