Course Syllabus

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Due to ongoing Covid-19 pandemic, and in recognition of stay-at-home recommendations from the Governor of State of Hawaii and the **President of Chaminade University (https://chaminade.edu/coronavirus/)** , BI305 students may attend class in person or via online format. ALL classrooms have been staged to facilitate social distance requirements; hand sanitizers are also provided. We ask that students convey their choice to Advising at **https://chaminade.edu/advising/ (https://chaminade.edu/advising/)** .

To obtain a pdf of this syllabus, go to Chaminade's Course Syllabus Repository at **https://syllabus.chaminade.edu/ (https://syllabus.chaminade.edu/)** and search for the course syllabus (Subject: Biology, Instructor: Dohm, Course number: BI305).

Chaminade University OF HONOLULU

BI305 Syllabus

Genetics and Genomics

Spring 2021 meeting days, times, and locations:

Section 1: Once per week

- Monday 8:30 – 11:50 AM, Eiben Hall, CHING Conference Room

Section 2: Once per week

- Monday 1:30 – 3:50 PM, Eiben Hall, CHING Conference Room

Instructor: Dr Mike Dohm, **Office**: WSC, room 108; **Phone**: 808-739-8543
Email: mdohm@chaminade.edu (students: Please use CANVAS to communicate about your course)

Office hours: Tuesday & Thursday 12:30pm – 2pm; Other times may be possible, but by appointment only.

Required textbook:

Genetics and Genomics in Nursing and Health Care, 2nd ed., 2018, by Theresa Beery, Linda Workman, and Julia Eggert (ISBN: 9780803660830). Click **here for link to book information**. Supplemental readings and other media provided by the instructor will also be assigned.

Recommended textbook:

Online Open Genetics textbook:
https://bio.libretexts.org/Bookshelves/Genetics/Book%3A_Online_Open_Genetics_(Nickle_and_B Ng)
(https://bio.libretexts.org/Bookshelves/Genetics/Book%3A_Online_Open_Genetics_(Nickle_and_Barrette-Ng))

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.

Catalog description (https://catalog.chaminade.edu/):

BI 305 Genetics and Genomics (3) Nursing required course. Basic concepts in genetics and genomics, Current research, new ways to diagnose genetic conditions and genetic technologies that provide understanding of the genetic component to common chronic diseases are explored. 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. Restricted to students accepted in the CUH Nursing major. *Prerequisites: BI 152/BI 152L, BI 250/250L, CH 250, NUR 202, NUR 203.*

Service Learning:

Students will be required to provide 10 hours during the semester for an organization or in an activity that is related to human genetics. More information on the opportunities will be provided in the first few weeks of class. A 2-3 page reflection paper will be due during final week on the activities. 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. (*Covid-19 pandemic: service learning activities may be changed.*)

Course assessment:

Your grade will be the result of points earned from Service Learning, Quizzes & worksheets, attendance, participation, and exams.

- **Service Learning**: (*Covid-19 pandemic: service learning activities may be changed.*) In coordination with the Service Learning Office, you will be “assigned” to lead a workshop or learning opportunity held with one of the community partners. You will be part of a team and advised in part by Biology students from the concurrent BI308 course. You must also complete a reflections paper turned into the Service Learning Office. Failure to complete your Service Learning obligations will result in a minimum of one grade level reduction. Learn more about service learning at https://servicelearning.chaminade.edu/
- **Reflection papers**: In addition to a reflection paper for Service Learning, students will be afforded

Reflection papers: In addition to a reflection paper for Service Learning, students will be afforded the opportunity to reflect on ethics of current genetics issues.

- **Quizzes and Worksheets**, hereafter simply referred to as Quizzes, consist of testing of concepts (multiple choice) and work related to case studies drawn from chapters of your textbook and/or from materials provided by the instructor. These are group activities to be completed outside of class time. Their purpose is to deepen your understanding of genetics, model how medical professionals apply genetic principles, and provide hopefully meaningful context to your reading.
- **Attendance**: Employers emphasize showing up for work, on time; reliability is a key characteristic of successful employment. Therefore, and in keeping with your nursing program, attendance is mandatory. *Important: Because we meet only once per week, you are expected to attend every session.* For REMOTE students, attendance is recorded based on CANVAS activity -- the minimum expectation for REMOTE attendance is 3 hours logged on to BI305 CANVAS and a minimum of two page views. In-person attendance will be taken at random during the semester (i.e., the instructor won't take daily roll call). If you miss more than one lecture for any unexcused absence you will receive zero points for Attendance. Continued absence puts the student at risk of administrative withdrawal from the course (see **Student Handbook (https://chaminade.edu/wp-content/uploads/2020/08/NEW-STUDENT-HANDBOOK-20-21-Final-8.4.2020.pdf)**). If you know you will miss class, please contact Dr Dohm via CANVAS messaging in advance.
- **Participation** in class, whether in-person or online, includes asking questions, Work will include: use of online databases and bioinformatics tools and will be supported by work on quiz and or worksheet exercises.
- **Exams**: Three (3) exams, each based on about 4 weeks of lectures from course material (e.g., chapters from your textbook, lectures, quizzes, and other required reading or case studies). Exams will include about 30 questions (all multiple choice, true/false). Each exam will include opportunities for bonus points (5% per exam). The third exam will be scheduled for finals week and should be considered cumulative.

A total of **425 points** may be earned throughout the semester; each item has the following value.

Item	*How many?*	*How often?*	*How many points each?*	*Total points towards final grade*	*Percent of final grade (rounded)*
Attendance & participation		*throughout semester*	15 10	25	6%
Service learning • *client presentation* • *reflection paper*	*1*	*10 hours during semester*	25	25	12%
Quizzes & worksheets	*10*	*every 1-2 weeks*	*10*	*50*	6%

Reflection papers	5	*every 3-4 weeks*	5	25	6%
Exams	*3*	*every 4-5 weeks*	*100*	*300*	71%

Final grade:

Your semester letter grade will be based on the following point distribution out of 425 points possible.

Points earned	*Percent of total*	*Letter grade*	*Interpretation (CUH (https://catalog.chaminade.edu/) catalog (https://catalog.chaminade.edu/))*
> 382	*90-100%*	*A*	Outstanding scholarship and an unusual degree of intellectual initiat
340 – 381	*80-89%*	*B*	Superior work done in a consistent and intellectual manner
297 – 339	*70-79%*	*C*	Average grade indicating a competent grasp of subject matter
255 – 296	*60-69%*	*D*	Inferior work of the lowest passing grade, not satisfactory for fulfillm of prerequisite coursework.
< 254	*< 60%*	*F*	Failed to grasp the minimum subject matter; no credit given

Access to course website

BI 305 is a web-enhanced courses, i.e., instruction takes place in the classroom, and technology, including the website, are used to complement and support face-to-face instruction. All lecture slides, course handouts, including this syllabus, will be made available to you at our web site. Quizzes typically will also be handled via the website, although other arrangements for taking quizzes may be available upon request. You may access the website via Chaminade's Canvas. You should already be enrolled. The Canvas site uses latest SSL security; your information is safe provided you use a decent password. Although Canvas provides a Grading feature, this feature is for you to monitor your progress only; your official grades for the course are maintained by Dr Dohm in his grade book in his office.

Use of Canvas for BI 305 is part of your participation in the course. For a satisfactory score on this element, you are expected to spend about an active hour each week on the site.

Course learning outcomes:

This course will introduce students to the foundational concepts of genetics and genomics. Students will

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

At the conclusion of the BI305 course, students will demonstrate the ability to (mapped to Biology PLO, and to * Essential Nursing Competencies)

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

*Essential Nursing Competencies Guidelines for Genetics and Genomics: **Calzone, K. A., Jenkins, J., Prows, C. A., & Masny, A. (2011). Establishing the outcome indicators for the essential nursing competencies and curricula guidelines for genetics and genomics. *Journal of Professional Nursing*, *27* (http://ncbi.nlm.nih.gov/pmc/articles/PMC3099038/) (3), 179-191 (http://ncbi.nlm.nih.gov/pmc/articles/PMC3099038/)** .

Biology Program Learning Outcomes (PLO)

1. Apply the scientific method in the design and testing of hypotheses
2. Transform and display, statistically evaluate, validate, and interpret scientific data and communicate the results of such analyses effectively both orally and in writing.
3. Acquire and comprehend information from published scientific literature, databases and bioinformatics software to extract and interpret biological data.
4. Recognize the chemical and physical principles that underlie all life forms, and the biological organization at the molecular, cellular, tissue, organ, organism, and system levels that emerge from these principles
5. Define the components and processes of genetic and epigenetic information transmission, and their determinant effects on the adaptive and evolutionary processes that they drive

determinant effects on the adaptive and evolutionary processes that they drive.
6. Evaluate the etiology of major human disease burden in terms of, pathophysiological mechanisms, epidemiology within populations and possible therapeutic approaches.
7. Integrate an awareness of bioethical issues to positively influence the application of science to service, justice and peace in the solution of societal problems

University outcomes

Marianist Values

This class represents one component of your education at Chaminade University of Honolulu. An education in the Marianist Tradition is marked by five principles and you should take every opportunity possible to reflect upon the role of these characteristics in your education and development:

1. Education for formation in faith
2. Provide an integral, quality education
3. Educate in family spirit
4. Educate for service, justice and peace
5. Educate for adaptation and change

Native Hawaiian Values

Education is an integral value in both Marianist and Native Hawaiian culture. Both recognize the transformative effect of a well-rounded, value-centered education on society, particularly in seeking justice for the marginalized, the forgotten, and the oppressed, always with an eye toward God (Ke Akua). This is reflected in the ‘Olelo No’eau (Hawaiian proverbs) and Marianist core beliefs:

1. Educate for Formation in Faith (Mana) E ola au i ke akua (‘Ōlelo No‘eau 364) May I live by God
2. Provide an Integral, Quality Education (Na’auao) Lawe i ka ma‘alea a kū‘ono‘ono (‘Ōlelo No‘eau 1957) Acquire skill and make it deep
3. Educate in Family Spirit (‘Ohana) ‘Ike aku, ‘ike mai, kōkua aku kōkua mai; pela iho la ka nohana ‘ohana (‘Ōlelo No‘eau 1200) Recognize others, be recognized, help others, be helped; such is a family relationship
4. Educate for Service, Justice and Peace (Aloha) Ka lama kū o ka no‘eau (‘Ōlelo No‘eau 1430) Education is the standing torch of wisdom
5. Educate for Adaptation and Change (Aina) ‘A‘ohe pau ka ‘ike i ka hālau ho‘okahi (‘Ōlelo No‘eau 203) All knowledge is not taught in the same school

Alignment of Natural Sciences Courses with Marianist and Hawaiian values of the University.

The Natural Sciences Division provides an integral, quality education: sophisticated integrative course content taught by experienced, dedicated, and well-educated instructors.

1. We educate in the family spirit – every classroom is an Ohana and you can expect to be respected yet challenged in an environment that is supportive, inclusively by instructors who take the time to personally get to know and care for you.
2. We educate for service, justice and peace, since many of the most pressing global issues (climate change, health inequity, poverty, justice) are those which science and technology investigate

change, health inequity, poverty, justice) are those which science and technology investigate, establish ethical parameters for, and offer solutions to.

3. We educate for adaptation and change. In science and technology, the only constant is change. Data, techniques, technologies, questions, interpretations and ethical landscapes are constantly evolving, and we teach students to thrive on this dynamic uncertainty.
4. The study of science and technology can be formative, exploring human creativity and potential in the development of technologies and scientific solutions, the opportunity to engage in the stewardship of the natural world, and the opportunity to promote social justice. We provide opportunities to engage with the problems that face Hawai'i and the Pacific region through the Natural Sciences curriculum, in particular, those centered around severe challenges in health, poverty, environmental resilience, and erosion of traditional culture. The Marianist Educational Values relate to Native Hawaiian ideas of mana, na'auao, ohana, aloha and aina. We intend for our Natural Sciences programs to be culturally-sustaining, rooted in our Hawaiian place, and centered on core values of Maiau, be neat, prepared, careful in all we do; Makawalu, demonstrate foresight and planning; `Ai, sustain mind and body; Pa`a Na`au, learn deeply.

Course and University Policy, Reminders, and Notices:

1. Chaminade University abides by all aspects of the **Family Educational Rights and Privacy Act (FERPA)** (http://ed.gov/policy/gen/guid/fpco/ferpa/students.html) . Details of Chaminade's implementation of FERPA are available in your **Student Handbook** (https://chaminade.edu/wp-content/uploads/2020/08/NEW-STUDENT-HANDBOOK-20-21-Final-8.4.2020.pdf) (**SH** (https://chaminade.edu/wp-content/uploads/2020/08/NEW-STUDENT-HANDBOOK-20-21-Final-8.4.2020.pdf)).

2. 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 (**SH** (https://chaminade.edu/wp-content/uploads/2020/08/NEW-STUDENT-HANDBOOK-20-21-Final-8.4.2020.pdf)).

3. 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. Exams are based on the same concepts and problems that the text questions address.

4. Class begins and ends each time exactly on the scheduled start time. 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 – going it alone is not recommended.

5. It is university policy that any student who stops attending a course without officially withdrawing may receive a failing grade (**SH (https://chaminade.edu/wp-content/uploads/2020/08/NEW-STUDENT-HANDBOOK-20-21-Final-8.4.2020.pdf)**). Unexcused absences equivalent to more than a week of classes will lead to a grade reduction for the course.

6. 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 an exam or 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. Please utilize my official office hours or make an appointment via the course website. You are encouraged to use the Ask Dr Dohm forum – if you have a question, there is an excellent chance that others in the class have similar questions – use of Ask Dr Dohm forum counts as participation.

8. Return of graded paper material will be within ten business days after you take the graded assignment.

9. 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 10 and 11). 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.

10. You are encouraged to bring and use your laptops or tablets to genetics lecture and workshops. However, on exam days, calculators will be provided for your use; you may not use your smartphones, tablets, or laptops during exams.

11. You may not record audio, images, or video in the classroom without expressed permission of the instructor.

12. 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[at]chaminade.edu.

13. You are encouraged to work together; however, all graded material must be your own. Cheating in the form of plagiarism (offering of work of another as one's own, **SH (https://chaminade.edu/wp-content/uploads/2020/08/NEW-STUDENT-HANDBOOK-20-21-Final-8.4.2020.pdf)**), collusion, and

    deception will not be tolerated and will negatively affect your grade. Because the university is an academic community with high professional standards, its teaching function is seriously disrupted and subverted by academic dishonesty. Such dishonesty includes, but is not limited to, cheating, which includes giving/receiving unauthorized assistance during an examination; obtaining information about an examination before it is given, using inappropriate/prohibited sources of

information during an examination; altering answers after an examination has been submitted; and altering the records on any grade. (Refer to the **CUH catalog** **(https://catalog.chaminade.edu/)** for further information).

14. 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, Room 101 Student Support Services Building, 808 735-4845, counselingcenter[at]chaminade.edu.
    • Any priest serving as a sacramental confessor or any ordained religious leader serving in the sacred confidence role.

15. Pursuant to 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 Chaminade Counseling Center at 808-735-4845 or counselingcenter[at]chaminade.edu, for further information 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 CUH Counseling Center (735-4845) by the end of the third week of classes. Failure to provide written documentation will prevent your instructor from making necessary accommodations.

Course Schedule

See **BI305 Class Schedule**

BI305 Quiz & Worksheet schedule

Expect quizzes or worksheets once every week

BI305 Reflection schedule

Expect reflections once every 2-3 weeks

BI305 Service Learning Schedule

Presentations to schools and or community groups typically occur in late March, early April. Negotiations between Chaminade's Service Learning office and community groups are ongoing at the beginning of the semester and will be finalized by the 4th week of the semester. Course time will be set aside for you to work on presentations, but expect some outside class time commitment.

BI305 Exam schedule

Exams	Chapters from 2nd edition, Beery & Workman(2012)	Dates
1	Ch01 – Ch03	Friday, Feb 14
2	Ch04 – Ch06, Ch14, Ch15	Friday, Mar 20
3	Ch07 – Ch10, Ch16, Ch17	Finals week, to be announced

Course Summary:

Date	Details	
Fri Apr 3, 2020	**Exam01** (https://chaminade.instructure.com/calendar?event_id=15643&include_contexts=course_14393)	1:30pm to 4:20pm
Fri May 8, 2020	**Exam02** (https://chaminade.instructure.com/calendar?event_id=15642&include_contexts=course_14393)	1:30pm to 4:20pm
Fri Feb 5, 2021	**Quiz00** (https://chaminade.instructure.com/courses/14393/assignments/162131)	due by 11:59pm
Fri Feb 12, 2021	**Reflection 1: Covid-19 pandemic** (https://chaminade.instructure.com/courses/14393/assignments/162132)	due by 11:59pm
	Reflection 1: Nature & Nurture (https://chaminade.instructure.com/courses/14393/assignments/160374)	due by 11:59pm
	ho‘oilina Quiz No. 1 (https://chaminade.instructure.com/courses/14393/assignments/160754)	due by 11:59pm
Fri Feb 19, 2021	**ho‘oilina Quiz No. 2** (https://chaminade.instructure.com/courses/14393/assignments/160756)	due by 11:59pm
	ho‘oilina Quiz No. 3 (https://chaminade.instructure.com/courses/14393/assignments/160755)	due by 11:59pm

Date	Details	
Sun Feb 28, 2021	BI305 Exam01 (https://chaminade.instructure.com/courses/14393/assignments/160751)	due by 11:59pm
Fri Mar 5, 2021	Reflection 2: Playing God; Forever Young (https://chaminade.instructure.com/courses/14393/assignments/160378)	due by 11:59pm
Fri Mar 19, 2021	Reflection 3: A world without Down's Syndrome (https://chaminade.instructure.com/courses/14393/assignments/160376)	due by 11:59pm
Sun Mar 28, 2021	BI305 Exam02 (https://chaminade.instructure.com/courses/14393/assignments/160367)	due by 11:59pm
Fri Apr 2, 2021	BONUS -- What constitutes evidence in medicine? (https://chaminade.instructure.com/courses/14393/assignments/160368)	due by 11:59pm
	BONUS -- What makes a good science project? (https://chaminade.instructure.com/courses/14393/assignments/160369)	due by 11:59pm
Fri Apr 9, 2021	Reflection 4: What makes us human? (https://chaminade.instructure.com/courses/14393/assignments/160375)	due by 11:59pm
Fri Apr 23, 2021	Reflection 5: Antibiotic use (https://chaminade.instructure.com/courses/14393/assignments/160377)	due by 11:59pm
Mon May 3, 2021	Submit Martian's Syndrome Case Study (https://chaminade.instructure.com/courses/14393/assignments/160380)	due by 11:59pm
Thu May 6, 2021	BI305 Exam03 (https://chaminade.instructure.com/courses/14393/assignments/160366)	due by 11:59pm
	ho‘oilina Quiz No. 4 (https://chaminade.instructure.com/courses/14393/assignments/160370)	
	ho‘oilina Quiz No. 5 (https://chaminade.instructure.com/courses/14393/assignments/160371)	
	ho‘oilina Quiz no. 6 (https://chaminade.instructure.com/courses/14393/assignments/160372)	

Date	Details
	Reflection Paper Service Learning (https://chaminade.instructure.com/courses/14393/assignments/160379)