

University of Massachusetts Dartmouth
BIO 1XX: Biology of Genetic Disease
Instructor: Dr. Cindy Ladino
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Course Description: Fundamentals of genetic disease and disorders . Explains the role of genes in causing disease and disorders and the prospects that genetic information will help prevent, treat and cure diseases. This course also presents the ethical issues and social context of medical genetics. This course is intended for the non-biology major and meets the University Studies Curriculum Cluster 2 B requirements.

Learning Outcomes

Course-Specific Learning Outcomes: After completing the course, students will be able to:

1. Understand and use specialized vocabulary specific to the chosen topic.
2. Explain basic biological concepts relevant to the topic.
3. Apply those biological concepts to understand observations of the natural world.
4. Discuss how the topic interacts with human concerns.

University Studies Learning Outcomes: Cluster 2B Science in the Engaged Community. After completing the course, students will be able to:

1. Analyze and evaluate the use of scientific information in the context of social, economic, environmental or political issues.
2. Apply scientific theories and knowledge to real-world problems.
3. Effectively communicate scientific information in writing

Required Text : Gillham, Nicholas. **Genes, Chromosomes, and Disease: From Simple Traits, to Complex Traits, to Personalized Medicine.** FT Press, 2011. ISBN-10: 0137075448.

Course Schedule (subject to change):

<u>Week</u>	<u>Topic</u>	<u>Reading Assignment</u>
1	Hunting for disease genes	Chapter 1
2	How genetic diseases arise	Chapter 2
3	Quiz 1 Chapters 1 and 2 Ethnicity and genetic disease	Chapter 3
4	Susceptibility genes and risk factors	Chapter 4
5	Quiz 2 Chapters 3 and 4 Genes and Cancer	Chapter 5
6	Project I: Brochure Genes and Behavior	Chapter 6
7	Quiz 3 Chapters 5 and 6 Epigenetics	Handouts

8	Preventing genetic disease	Chapter 8
9	Quiz 4 Chapters 7 and 8	
	Treating genetic disease	Chapter 9
10	Project II: Research Paper	
	Personalized medicine	Chapter 10
11	Quiz 5: chapters 9 and 10	
12	A cautionary tale	Postscript
13	Using the Web	
14	Project III: Final Project	

Grading:

The Registrar's Office will mail final grades to students. You may check your final grades by accessing COIN. Grades will not be mailed, e-mailed or phoned-in to students. Posting of final grades is prohibited by university and departmental policy.

(3) Projects @ 25 points each	75 points (75%)
Quizzes.....	<u>25 points (25%)</u>
	100 points (100%)

Quizzes will be given as scheduled and consist of short-answer, multiple choice and true/false questions on information from the textbook chapters and lecture. There are no make-ups for the quizzes. The last page of this syllabus provides information concerning the projects. All submitted assignments must be of the highest quality: specific and detailed. You must be present and on time for class to receive credit for all projects and quizzes. E-mailed assignment submissions will not be accepted. Late assignments will not be accepted without an official note (should be on letterhead) as follows and may be subject to a late fee of 2 pts/day. Absences will not be excused without official notification.

Sick Absence : doctor's note or UMD Health Center note

Athletics: Note from Coach

Other Reason: Note from Office of Student Services or the Dean of Students Office

Extra Credit Assignments:

During the semester extra credit assignments will be offered. You may or may not receive notification as to when these assignments will be given. There are no make-ups for these assignments.

Grading Scale:

A+ 97-100, A 93-96, A- 90-92, B+ 87-89, B 83-86, B- 80-82, C+ 77-79, C 73-76, C- 70-72, D+ 67-69, D 63-66, D- 60-62, F < 60

Attendance Policy:

Only students officially registered for this course may attend classes. **Please arrive on time for class. If you are late or leave early without the instructor's permission, you will not receive credit for any in-class assignment due on that day and your course grade may be lowered.** Once the class begins, please be prepared to remain for the entire class session. You must be present in class for the entire session to receive credit for projects.

You are considered "officially registered" for this course if your name/ID appears on the official UMD roster. All students are responsible for following the official UMD academic calendar. Due to holiday observations throughout the semester, please note that the day this class meets is subject to change.

Absence from class does not at any time, under any condition or circumstance either excuse or release a student from the satisfactory completion of any course obligation/assignment and/or the consequences of any announcements made by the instructor, nor does it absolve the absentee from the responsibility to make-up and/or remain current with any and all subject matter missed during the time of absence. Absences may be excused with instructor's permission and may require official UMD notification.

Cell Phone/Pager Policy:

The use of cell phones in any manner is strictly prohibited at all times during class. Please be sure your cell phones are in the "off" or "vibrate" mode when class is in session. Texting while class is in session **is not allowed**. Use of earbuds and headphones is **prohibited**.

Computerized, Electronic and/or Audiovisual Devices:

The use of any electronic devices, including computers, is not allowed in class without permission. This includes Kindles, iPods etc.

Course Withdrawal:

There is no penalty for withdrawal, other than a "W" on your transcript, as long as it is done by the last date for student-generated withdrawal. A "W" will not affect your GPA (grade point average) but it may affect your SPI (student progress index) which may have consequences on your financial eligibility or academic standing. Verbal withdrawals cannot be accepted. If you choose to withdraw, please fill out the necessary withdrawal form by the appropriate deadline. Students who do not officially withdraw from the course, but instead simply stop attending class will receive a letter grade for the course.

Incomplete Grades: Work Incomplete may be given only in exceptional circumstances, at the instructor's discretion and at the student's request made no more than 48 hours after the final examination or last class. The student must be passing at the time of the request or must be sufficiently close to passing for the instructor to believe that upon completion of the work the student will pass the course. If the work is not completed within a year of the recording of the grade of I, the grade will become an F9I). "I" grades cannot be changed to "W".

Academic Difficulty:

Students experiencing academic difficulty should see me as quickly as possible for assistance. Please do not procrastinate. UMD offers students free tutoring in a variety of disciplines at the Academic Resource Center. The centers include the Writing and Reading Center, the Science and Engineering center, and Center for Access and Success (Pine Dale Hall, Room 7136).

Writing and Reading Center: x8710 in Group I-220
Math and Business Center: x8716 in Group I- 010
Science and Engineering Center: x8718 in Group II- 271B

Academic Negligence:

We maintain a **zero-tolerance** policy towards academic negligence in any form. Academic negligence is demonstrated by **failure to do assigned work, excessive absences, repeated lateness to class, academic dishonesty, or distracting or disruptive classroom behavior**. Any faculty member may, at any time, recommend in writing to the Dean of Academic Affairs that a student guilty of academic negligence be dropped from a course with a grade of “W” or “F”. As stated in the Academic Ethical Standards section of UMD student Handbook, academic dishonesty may result in expulsion from the University.

A responsible, courteous and mature attitude is expected and required of all students at all times while in the classroom. Students are required to abide by the Code of Conduct as stated in the college catalog. Any attempt to create an intimidating, hostile or offensive situation or subject a person to unwanted and unsolicited attention will not be permitted. Please note that “distracting or disruptive behavior” includes **the use of cell phones, talking at inappropriate times in class, arriving late to class and leaving class early without the instructor’s permission**. Consequences of these actions will proceed as follows:

- a. After one warning in class, you will be asked to speak with me after class.
- b. Repeated action will result in having the student removed from the class with a possible grade reduction.
- c. If the student refuses to leave or if the action continues, the Academic Dean will be notified and this may result in the student receiving a “W” or “F” in the course.

ADA Compliance:

UMD strives to comply with the provisions of Title III of the Americans with Disabilities Act of 1990 and Section 504 of the Rehabilitation Act of 1973 in accordance with university policy, if you have a demonstrated disability and require accommodations to obtain equal access in this course. Please meet with me at the beginning of the semester and provide the appropriate paperwork from the Center for Access and Success. The necessary paperwork is obtained when you bring proper documentation to the Center for Access and Success which is located in Pine Dale Hall, Room 7136; phone: 508-999-8711.

Requirements for Completion of the Course:

- * All reading assignments are mandatory
- * Each student must be current with all assigned readings
- * Students must take and achieve at least a minimum passing average on projects
- * Students are bound by the details and provisions and rules/regulations of the official UMD catalog
- * Students must be free of academic negligence
- * Students must be officially registered for this course by the Registrar
- * Students are bound to the official UMD academic calendar

Project Descriptions and Grading Rubrics : Students must be present and on time for class to receive credit for submitted projects. E-mailed submissions will not be accepted. Late assignments will not be accepted without official note of excuse (please refer to syllabus). Project submissions should be examples of your best work: detailed and specific.

Project I: Awareness Information Brochure: Type of Genetic Disease

The goal of this assignment is to introduce students to the different types of inherited diseases. It satisfies the three outcomes as outlined in University Studies Cluster 2B. To complete this project, students must effectively communicate scientific information concerning genetic disease in writing. Students must analyze scientific information and applied it in the context of social issues related to genetic disease, such as risk factors, genetic screening and treatment. This project satisfies University Studies Cluster 2B outcomes #1, #2 and #3).

A. Your brochure should contain the following:

Name

Title

Descriptive Information in Detail : type of disease, risk factor, hereditary component, genes mutated including their normal function, treatment, stages, pathology (with pictures), causes (epidemiology), at least 5 scientific references in a separate section on back of poster.

B. Grading:

Name 2 pts

Title 2 pts

Design/Neatness 4 pts

References 5 pts

Content 12 pts

Total 25 pts

C. References:

Author (last, first name) , Title, Book (journal or website), Date published, Pages Cited.

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Project II: Power Point Presentation

The goal of this project is to provide students with an in-depth study of the role of a specific gene in a particular inherited disease. Role of genes in disease/disorders: a specific genetic abnormality, the role of the normal gene in development, and how it relates to disease. This is a writing-intensive assignment in which students must effectively communicate scientific information in writing. This project satisfies University Studies Cluster 2B outcome #3.

A. Should contain at least 10 informative slides and at least 5 scientific references

B. Grading: This project is worth 25 points and will be assessed on the following: content (10 pts), writing quality (10 points), references (5 points)

Project III: Final Project

The goal of Project III is to showcase what students have learned in this course. The topic and mode of presentation for this project are chosen by the students. This provides flexibility and freedom to create in-depth, interesting, and creative projects. Some examples of projects include: power point presentations, research papers, patient interviews, models, pamphlets, art projects, and videos. Videos, art projects and models require a two-page essay which explains the project. Research papers should be at least 10 pages in length, Power point presentations should contain at least 10 informative slides. All projects should include at least 10 scientific references. Examples of topics include: gene therapy, the relationship between a specific ethnicity and genetic disease, specific treatments, genetic counseling, and diagnostic procedures. Your project must relate your topic to real-world problems concerning genetic disease and be presented in the context of social issues related to genetic disease. This project satisfies University Studies Cluster 2B outcomes #1 , #2 and #3. It cannot be on the same topic as in Project I or Project II.

A. The topic and mode of presentation is your choice but must be reviewed by me and **cannot be on a type of disease or on genes mutated in an inherited disease.** All projects must include at least 10 scientific references. If you are writing a paper or a power point presentation, it should be at least 10 double-spaced pages in length. If you are submitting a model or an art project, you should also include a detailed report explaining your project, including at least 10 references.

B. Grading: This project is worth 25 pts. It will assessed as in Project I (for posters/no assessment) or as in Project II (for all other projects).