

Course Information and Syllabus

Bi122: Introduction to Human Genetics

Summer 2021

Professor: Dr. Amy Connolly (amyc@uoregon.edu)

TA: Starla Chambrose (starlac@uoregon.edu)

Course Overview

This course will explore 1) the genetic and molecular basis of heredity and inherited traits, 2) how genetics & genomics reveal an understanding of the human condition, including genetic diseases, disability, cancer, and sex development 3) learn how technologies like genetic testing, gene therapy and CRISPR gene-editing work and 4) the ethical ramifications of some of these technologies like prenatal tests, sex testing in sports, ancestry services, BRCA gene tests, gene therapy and the gene editing tool CRISPR. Additionally, this course will look at human variation at the genetic level and consider why some genetic variations are more common in certain parts of the world. This course will also look at how our modern understanding of genetics disproves the outdated theory that humans, biologically-speaking, can be categorized by race. This course will also look at how genetics regulates the development of sex (male, female and different types of intersex).

This course requires no previous knowledge of biology, and will introduce principles of Mendelian genetics, Non-Mendelian inheritance, mitosis and meiosis, transcription and translation, mutations, population genetics, and other foundational concepts necessary to understand the technologies discussed and provide substantive input in class conversations.

Course Objectives

Students will be able to...

- use scientific terminology to explain what genes are, how they are inherited, make predictions about the likelihood of inheriting a trait or disease, compare the difference between Mendelian genetics and alternative patterns of inheritance, explain how genes are transcribed and translated, and examine the consequence to the protein when a gene has been mutated.
- apply genetic principles to explain why genetic disorders like Cystic Fibrosis, Huntington's Disease, and Down Syndrome manifest.
- apply genetic principles and understanding of the cell cycle to understand how cancer results.
- explain using scientific terminology how sex developments and the genes that regulate the process and apply this information to explain what happens when intersex development occurs.

- Explain how ancestry genetic testing services work and point out their strengths and weaknesses.
- Explain why race is not a biological construct, but a social one. Point to evidence in genetics and biology to support this. And be able to dispel racial stereotypes based on incorrect understanding of genetics and biology.
- Comprehend a given current affairs article, news story, or documentary related to human genetics (e.g. genomics testing, human disease, personalized medicine); confidently summarize the major points to family, friends, and colleagues including conveying the issue's significance (including any ethical concerns) and explaining the underlying genetics and molecular biology.
- consider a variety of viewpoints on a particular ethical discussion where genetics intersects with societal topics and reflect upon how their values influence their opinions.
- use evidence from the reading (or elsewhere) to support the thesis or main message of their writing assignment.
- Discuss controversial issues in a constructive manner, which includes listening to others and articulating tricky ideas with the good intention of reaching deeper understanding and solving problems.

Daily Class Structure, Grades and Related-Policies:

Course Overview: See last page for a day-to-day account of what we are doing.

Modules: There is a module due almost every day of the term (see Canvas or last page). Modules will consist of lecture videos, readings (some written by myself, others from your textbook or from other sources, etc.), discussions, activities, supplementary videos, writing assignments and quiz questions. The quiz questions and writing assignments associated with each module will be graded on accuracy; this is how you will receive points for the module. Answers will be revealed the following day to the quizzes. You are encouraged to work ahead if the modules are published.

Grading

Daily Modules: 90% (16 modules worth 3-7% each; see "Assignments" on Canvas for details)

Final Exam: 10%

A+	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
99+	94-99	90-93	87-89	84-86	80-83	77-79	74-76	70-73	67-69	64-66	60-63	59-

*Please note, that I may draw grade cut offs lower than what's outlined above, but I won't draw grade cut offs higher.

At the end of the term,

- please do not ask for your grade to be bumped and
- please do not ask for extra credit.

Late Policy: You will have by 11:59 pm of the due date to complete the modules.

If a quiz is submitted late, there will be a 15% penalty. The penalty is in place because answers become available at 12:00 am the following day. You have **7 days** to complete a late assignment and then it is marked 0, with the exception being the last week of class Week 4. For the last week of class, **no late assignments will be accepted after 11:59 PM Wednesday, July 14.**

Exams

The final will be given through Canvas. There will be a 90 minute time allotment with a due date. You will have a 48-hour window to take the exam from **July 13 at 11:59 PM- July 15, 11:59 PM.** Exam may be available earlier, if I finish it earlier.

Rules for Remote Learning and Academic Honesty:

Modules: You may work together with peers, but do not submit somebody else's work or answers.

Exams: You must complete these by yourself. You are on the honor system here. Do not share test answers with others. Do not discuss the exam with anyone else as you take it. Do not screen shot exam images and share them, unless you are sharing them with your instructor to discuss.

Other information:

If you do believe there was a mistake in grading reach out to me within 4 days of receiving the grade.

Readings

Human Heredity: Principles and Issues, 11th Edition, Michael R Cummings

Online text can be rented through the bookstore or here:

<https://www.cengage.com/c/human-heredity-principles-and-issues-11e-cummings/9781305251052PF/>.

- You may also be able to find a hard copy used or new at the bookstore or on amazon if you wish.

Communicating with your Instructors:

Getting Help with Content

1. Office hours:

Office Hours	Instructor
Tuesday 10:00-11:00	Dr. Connolly
Wednesday 4:00-5:00	Starla
Thursday 10:00-11:00	Dr. Connolly
Thursday 4:00-5:00	Starla

2. Need more help? Contact your TA, Starla

- **Email:** Starla Chambrose will be your TA this term. You are welcome to email her with questions about the daily modules at starlac@uoregon.edu. She won't give you answers to the questions you are submitting but will try get your oriented in the right direction.
- **Discussion board:** Starla will also be monitoring the discussion board in case you want to ask a question there. Other students are welcome to reply and engage.

Questions about Grades

Contact me (Dr. Connolly) at amyc@uoregon.edu

For questions about grades, please direct them to me (Dr. Connolly). If you have a question or concern about a grade, contact me within **four days** of the due date. **No more corrections to grades will be made after the last module is due (Thursday July 15 at 11:59 PM).**

Note: You are also welcome to email me (Dr. Connolly) with content related questions, but dividing the roles between Starla and myself is a helpful way to streamline getting students help sooner.

Other Info:

Discussion of Controversial Issues:

In this class, we will be discussing information that may at times be sensitive in nature. My goal is to create a safe space for people to discuss complex ideas in a respectful manner. Please consider how you can vocalize your viewpoint in a thoughtful and compassionate way that will not make someone else feel alienated.

I care deeply and believe it is my responsibility, as your instructor, to make sure information is not presented in a way that marginalizes any group of people. I therefore welcome you to have private conversations with me if you believe I could improve in some fashion.

Discussion of Medical Issues:

In this class, we will be discussing information relating to disease treatment, medicine, genetic testing and gene therapy. As your instructor I can inform you of the various kinds of technology we are either developing or use, but I cannot advise you on your own personal choices. I am not a medical doctor. If you are interested in how the things we have talked about may influence you, I would suggest talking to your medical doctor about it.

Inclusiveness

The University of Oregon is working to create inclusive learning environments. Please notify the instructor if there are aspects of the instruction or design of this course that result in barriers to your participation. You may also wish to contact the Accessible Education Center in 164 Oregon Hall at 541.346.1155 or uoaec@uoregon.edu.

Mental Health Resources:

This past year has presented a lot of new challenges. If you need someone to talk to or are struggling, there are mental health resources available to you as a UO student. Please follow the links here.

<https://counseling.uoregon.edu>
<https://counseling.uoregon.edu/mental-health-resources>

Plagiarism & Cheating

Plagiarism and cheating will not be tolerated. You are expected to do your own work on all homework, assignments, and exams. You are encouraged to discuss ideas with other students and study together, but do not copy anyone else's work, and don't allow anyone else to copy your work. All students are expected to conform to the student conduct code (see URL below) - students not in compliance will be brought to the attention of the University.

Student Conduct Code

http://www.uoregon.edu/~stl/programs/student_judi_affairs/conduct-code.htm

The Final Word:

You will find that your instructor works hard to support your learning and provide multiple opportunities for you to be successful. At the end of the term, when your grade has been calculated, please do not request any opportunities for extra credit, or your grade to be bumped up to the next grade level. No such request will be granted.

Overview of Course Agenda

	Due Dates Except for the final, complete all modules by 11:59 pm of the date due
<i>Week 1</i>	
Look through the "START HERE" module, read syllabus, get your book.	Monday, June 21

Module 1: Introduction to Genetics and Cell Biology	Tuesday, June 22
Module 2: Mendelian Inheritance	Wednesday, June 23
Module 3: Lactose Intolerance	Thursday, June 24
<i>Week 2</i>	
Module 4: Cell Division	Monday, June 28
Module 5: Non-Mendelian Inheritance	Tuesday, June 29
Module 6: Non-Mendelian Inheritance Part 2	Wednesday, June 30
Module 7: Transcription/Translation	Thursday, July 1
<i>Week 3</i>	
Module 8: Mutations	Monday, July 5
Module 9: Genetics Disorders	Tuesday, July 6
Module 10: Cancer	Wednesday, July 7
Module 11: Genetic Testing	Thursday, July 8
<i>Week 4</i>	
Module 12: Sex Development	Monday July 12
Module 13: Ancestry	Tuesday July 13
Module 14: Gene Therapy and Editing in Humans	Wednesday, July 14
Final Exam: Due: 3:00 PM on Thursday July 16 Availability window: July 13 at 11:59 PM- July 15, 11:59 PM Timed: 90 minutes Final exam must be taken by yourself. Do not give or receive answers.	Thursday, July 15