

Course Information and Syllabus

Bi122: Introduction to Human Genetics

Spring 2017

Course Overview

We will explore 1) the genetic and molecular basis of heredity and inherited traits, 2) how genetics & genomics reveals an understanding of the human condition, including genetic diseases, cancer, and sexual development, 3) how basic and translational genetics research is leading to improvements to human health, and 4) current ethical discussions related to human genetics. All of the topics covered are likely to have a significant impact on our lives, as more and more of modern medicine and health decisions have a genetic basis.

This is a special section of BI122 taught as part of the University's Science Literacy Program (<http://scilit.uoregon.edu>): "SLP courses promote student-centered teaching and communication of science where non-science majors are empowered to consider scientific approaches to societal issues and have the opportunity to learn how to process and critique scientific information."

We will explore innovative pedagogical approaches focused around *active learning*. Therefore, be prepared to fully engage in classroom activities.

Learning Outcomes

Understand the basis of genetic inheritance; how information is stored in the human genome and transmitted through generation.

Consider, summarize, and debate the efficacy and ethics of modern genetic/genomic testing from the perspective of understanding what genes are, how they are inherited, how they result in traits or human disease, and how genomic analyses are performed & interpreted.

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.

Appreciate the origins of many fundamental biology and human health breakthroughs in genetic studies of model organisms. Apply the scientific method to design a hypothetical, straightforward genetics experiment to test an unresolved scientific question and/or to appraise/rebut a claim based on scientific results (or the lack thereof).

Determine the best medical approach to use given a patient's particular concern or disease. Be able to communicate how the treatment or test works, and why it would be the best medical approach for a given scenario.

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General Course Information

<i>Instructor</i>	<i>email</i>	<i>office hours</i>
Dr. Roo Vandegrift	awv@uoregon.edu	13:00 – 14:00 Tue, Onyx 360
<i>GEs (Graduate Employees):</i>		
Stacy Levichev-Connolly	aleviche@uoregon.edu	14:00 – 15:00 Mon, Onyx 360
Nicholas Sattler	nsattler@uoregon.edu	TBD
<i>BULAs (Biology Undergraduate Lab Assistants):</i>		
Enrique Gomez	enriqueg@uoregon.edu	09:00 – 10:00 Fri, Science Lib. B009
Cora Pyles	cpyles@uoregon.edu	11:00 – 12:00 Thu, Science Lib. B009

Email Etiquette:

- We will try to answer your email in a timely manner, however, we do not always check our email in the evening or on weekends.
- When emailing the instructor or GEs, please include "Bi122" in the subject line. This helps ensure that we will not overlook your email by accident.

Time and Location

Lecture:	110 Fenton	Tues 4:00 pm – 5:20 pm
		Thurs 4:00 pm – 5:20 pm
Discussions:	111 Huestis	Tues <u>Nicholas Sattler</u> 09:00 am – 09:50 am 10:00 am – 10:50 am
		<u>Stacy Levichev-Connolly</u> 11:00 am – 11:50 am 12:00 pm – 12:50 pm

Website

All class information will be posted on Canvas.

REQUIRED Supplies

iClicker (available in the Duck Store)

Textbook—*NOT Required*

Human Heredity: Principles and Issues, Michael R. Cummings (8th, 9th, or 10th edition)

Book should serve as a resource to guide your learning. You are not required to know any material from the book that isn't covered in the lectures. Relevant readings for each lecture are listed on Canvas, and should serve as a supplement to the content emphasized during class.

Available at:

Duck Store is carrying the new 10th edition

Additional Readings

We will incorporate additional readings, outside of the textbook. These readings will be listed, and posted on Canvas as PDFs.

Homework

There will be six problem sets assigned as homework throughout the term. Homework assignments are posted on Canvas. The homework assignments will be completed as Canvas Quizzes, and should be done before the deadline: midnight on Mondays. Answer keys will be posted later that day or the next day, so **no late homework accepted**. No exceptions; we drop the lowest homework assignment, so this should cover issues of illness, emergency, family obligation, etc.

Participation

We are using iClickers as a way to facilitate classroom participation and discussion. Please bring your iClicker to lecture, as you will receive credit for "clicking in" during class time — you will be scored on participation rather than correctness of answer.

In order to receive full participation points you need to be in class for at least 15 lectures. $5 \text{ points per day} \times 15 \text{ lectures} = 75 \text{ points}$. You are allowed to miss two class periods and still make a perfect attendance score. First day of class will be excused for everyone. In order to receive participation points for any given day, you have to answer at least 75% of the questions.

You must to register your iClicker on Canvas at some point during the first week of class to ensure that your participation is being scored.

Exams

There will be three exams: two midterms and one final. The final will essentially be a third midterm. Exam material is cumulative because concepts carry over from one topic to the next. However, each exam will primarily focus on the material covered within the specific section of the course preceding that exam. Exams will include material from the lectures, assigned readings, and discussion sections. The exams will most likely be multiple choice. The schedule for the exams is listed on the last page of this syllabus.

There should be no surprises on the exam. We will practice types of problems you will see on an exam in class, and we will post a checklist of what you are required to know. Make sure you can check that list off successfully before the exam.

Discussion Sections

Discussion sections are required, and are designed to help you understand the content and problem solve, and will thus be valuable for your success on exam day. In each discussion, you will engage in an activity that revolves around the content we covered in lecture that week. To receive Discussion points you must have fully engaged in the class activity and answered the activity questions to be turned in at the end of class correctly. Your GEs will grade these activities.

Grading

Exam 1	200 pts.
Exam 2	200 pts.
Exam 3	200 pts.
Homework (5 x 40)	200 pts.
Discussion (5 x 25)	125 pts.
iClickers (15 x 5)	75 pts.

You will not be graded on a curve, and so will not be competing with your fellow students.

A+	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
≥ 97	94– 96	90– 93	87– 89	84– 86	80– 83	77– 79	74– 76	70– 73	67– 69	64– 66	60– 63	≤ 59

Grades will be posted on Canvas as they are available. The final date for adjustments to any grade is one week after the exam or problem set has been returned to the student.

General Policy on Missed AssignmentsProblem Sets

We will *not* accept late assignments. We drop the lowest homework assignment, so this should cover issues of illness, emergency, family obligation, etc.

iClickers

You are allowed two absences before we reduce participation points, so this also should cover issues of illness, emergency, family obligation, etc.

Exams

In a class of 100 students, giving early or “make up” exams to the many students who want them is time-consuming. Therefore I will not permit make up exams unless there is a *legitimate* reason (which includes a *serious* illness, documented by a note from your physician or a family emergency). Missed exams for any other reason will receive a 0.

Discussion of Controversial Issues

In this class, we will be discussing information that may be sensitive to people from all walks of life. As a genetics instructor, I feel it is my job to inform you of facts relating to race, disability, sexual biology, and all of the variation that encompasses the wide spectrum of human genetics. The information we discuss is not intended to convince people of any one particular viewpoint.

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.

Classroom Etiquette

Please arrive on time. Lectures and discussion sections begin promptly at the stated time. Please do not leave early, as this is disruptive to everyone. If you have an unusual circumstance and must leave early, please sit near the exit so that you may leave quietly. Please be respectful of your fellow students. Cell phone use in class is not allowed.

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 uoac@uoregon.edu.

Plagiarism & Cheating

Plagiarism and cheating will not be tolerated. You are expected to do your own work on all homework, assignments, and exams. Using another student's iClicker during class constitutes cheating. 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 course instructors work 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 Lectures, Discussions, Problem Sets, and Exams

Week	Date	Meeting	Topic
<i>Topic I: DNA, Genes, and Inheritance</i>			
1	Tues, Apr 04	discussion	No class (beginning of term)
1	Tues, Apr 04	lecture 1	Syllabus and Introduction to Genetics
1	Thurs, Apr 06	lecture 2	Mendelian Inheritance
2	Tues, Apr 11	discussion	Homework #1 due Mendelian Inheritance
2	Tues, Apr 11	lecture 3	Beyond Mendelian Inheritance
2	Thurs, Apr 13	lecture 4	DNA & Genes
3	Tues, Apr 18	discussion	No homework due Transcription
3	Tues, Apr 18	lecture 5	DNA & Genes
3	Thurs, Apr 20	lecture 6	Mutations
4	Tues, Apr 25	discussion	Homework #2 due Translation
4	Tues, Apr 25	lecture 7	Mutations + Review
4	Thurs, Apr 27		EXAM 1
5	Tues, May 02	discussion	No homework due TBD
<i>Topic II: Topics in Genetics</i>			
5	Tues, May 02	lecture 8	Genetics Diseases
5	Thurs, May 04	lecture 9	Cancer
6	Tues, May 09	discussion	Homework #3 due Disease and Cancer
6	Tues, May 09	lecture 10	Epigenetics
6	Thurs, May 11	lecture 11	Sexual development
7	Tues, May 16	discussion	Homework #4 due Epigenetics and Sexual development
7	Tues, May 16	lecture 12	Immunology I
7	Thurs, May 18	Lecture 13	Immunology II

Week	Date	Meeting	Topic
<i>Topic III: Beyond the basics</i>			
8	Tues, May 23	discussion	Homework #5 due Review
8	Tues, May 23		EXAM 2
8	Thurs, May 25	lecture 14	Genetic Testing
9	Tues, May 30	discussion	No homework due Cystic Fibrosis testing simulation
9	Tues, May 30	lecture 15	Gene Therapy
9	Thurs, Jun 01	lecture 16	Personalized Medicine Stem Cell Research
10	Tues, Jun 05	discussion	No homework due TBD
10	Tues, Jun 05	lecture 17	Human diaspora
10	Thurs, Jun 08	lecture 18	Neanderthal ancestry
11	Wed, Jun 14		Final Exam (EXAM 3): 12:30