

Biology 305: Genetics

Spring 2016 Syllabus

Instructor: Miranda McManus

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Office: 65 Coming St. Room 213 (right at the top of the stairs). However, I will not be in my office as often this semester because I will be teaching mostly at Harbor Walk. You may be able to find me in one of the faculty offices in Harbor Walk West for those of us who have offices far away--HWWE 309 or 311.

Office Hours: I do not set office hours. Rather, so that I may accommodate all students' schedules, I ask that you send me an email with your schedule, so that I may look at my schedule and come up with a time that will work for both of us.

Text: *Genetics: A Conceptual Approach*, 5th ed., by Benjamin Pierce

Required materials: i>clicker, i>clicker 2, or i>clicker + (not the app!)

Course Description: The basics of the science of heredity. The course encompasses Mendelian genetics, the molecular basis of inheritance, changes in chromosome number and structure, gene mapping, mutations and population genetics. Population and quantitative genetic approaches are applied to clarify the understanding of evolution.

Learning Outcomes:

- To learn the basic principles, concepts, theories, and language that constitutes the discipline of genetics.
- To provide a framework for understanding how genetic information is organized, changes, and influences biological processes.
- To provide an understanding as to how genetics is used for addressing biological problems.

Course Objectives:

- Gaining familiarity with appropriate data, information and knowledge-gathering techniques and research skills in the discipline
- Using effective skills and strategies for working collaboratively
- Mastering a thorough understanding of the main concepts of genetics and how Mendelian genetics can be applied and expanded by an understanding of the mechanisms involved at the molecular level
- Developing critical and analytical skills through problem solving and special projects
- Relating genetics to other fields of biology, in particular evolution, molecular and developmental biology

Course format: This course will be using a "flipped" course format. You will be watching most of your lectures at online outside of class, and in class, we will primarily be doing active learning and discussion-based activities. This requires a lot of discipline on your part to ensure you keep up with the lectures and reading. However, it also offers you the ability to watch the lectures at your own pace and rewind as needed. The course lectures are broken down into shorter segments than a typical class, so you will often have to watch several of the lectures before class. There will often be i>clicker quizzes at the beginning of class to ensure that you are keeping up with the material.

My reason for using this format is to benefit you. You will learn a lot of information in this class! It can be difficult to retain it all, but even more difficult to understand it all. It will not do you any good to just memorize information in this class; you must be able understand and apply it. That can be very tough to do on your own. However, there is so much material to "cover" that there is not typically enough time to lecture as well as work out sufficient problems to help you to understand the material. Instead, you end up doing those problems at home where there is no one to help you get through it. By "flipping" the classroom, you will have the support of a classroom group and of me to help ensure your understanding.

Attendance: Your grade in this course relies heavily on your participation in class. In-class assignments and quizzes will sometimes be announced in advance, but often will not. Excessive absences are guaranteed to affect your grade. Attendance will not be taken; however, **no make-ups** will be allowed for missed assignments. Therefore, regular attendance is highly recommended. It is the student's responsibility to find out what was missed in case of unavoidable absence. If you must miss a class due to illness, you *may* be allowed to complete the missed work or an alternate assignment, but you must obtain an absence memo from the Office of the Associate Dean of Students at 67 George Street for me to even consider it. It must be a **documented** absence to be excused; you must talk to me about it, and it is at my discretion. You may access the required forms at the following address: <http://studentaffairs.cofc.edu/services/absence.php>. If you have extenuating circumstances, then speak to me on an individual basis. **MISSING 4-5 CLASSES IN A ROW WILL RESULT IN A "WA" GRADE (WITHDRAWN EXCESSIVE ABSENCE) AT MIDTERM AND/OR FINAL GRADE. A FINAL "WA" GRADE IS CALCULATED AS AN "F" IN YOUR GPA.** This policy does not apply if the absences are due to a **SERIOUS** medical or personal reason; however, in any case, it is the student's responsibility to contact me immediately with any issues.

Inclement weather: In the case that class is canceled due to inclement weather, it is your responsibility to check the news feed on OAKS and the daily course schedule to know what is expected of you by the next class.

Tests: There will be four tests over the course of the semester. They will all be offered in OAKS and could also have a take-home and/or in-class component that will be announced prior to the test. You will be given a specific timeframe in which you must have each test completed. Each of the online portions of the tests will open at noon on the first day of testing and will close at 8 PM on the last day of testing. Because all tests will be cumulative, there will be no final exam. *Students should be aware that unauthorized collaboration—working together without permission—is a form of cheating—this includes collaborating with classmates or other individuals on online tests.*

Missed tests or assignments: There will be **no make-ups** given for in-class assignments, quizzes, or tests. Students with extenuating circumstances must contact me in advance of the class or test that must be missed to discuss their options.

Accommodations for students with disabilities: The College will make reasonable accommodations for persons with documented disabilities. Students should apply at the Center for Disability Services/SNAP, located on the first floor of the Lightsey Center, Suite 104. Students approved for accommodations are responsible for notifying me as soon as possible and for contacting me at least one week before any accommodation is needed.

Academic dishonesty: Guidelines for this course will follow the College of Charleston Undergraduate Catalog policies for Academic Integrity and the Honor Code, Student Code of Conduct, and Classroom Code of Conduct. Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each incident will be examined to determine the degree of deception involved.

Students should be aware that unauthorized collaboration—working together without permission—is a form of cheating—this includes collaborating with classmates or other individuals on online tests. Unless the instructor specifies that students can work together on an assignment, quiz and/or test, no collaboration during the completion of the assignment is permitted. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information via a cell phone or computer), copying from others' exams, fabricating data, and giving unauthorized assistance.

Students can find the complete Honor Code and all related processes in the *Student Handbook* at: <http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php>

Community engagement and extra credit: It is important that as good citizens you engage yourself in the local community. Because of this, I offer extra credit opportunities that encourage good citizenship and community engagement. I will discuss these options with you in class. These will be the only opportunities for extra credit. Please do not ask me for any other extra credit.

OAKS: OAKS is the learning management system that is used by the College of Charleston. It is imperative that you learn to use OAKS, as it will be used by many of your classes as a way to provide material, give quizzes or tests, as a way to collect assignments, as a way to have class discussions, and as a way to communicate grades. I will be using OAKS extensively for this course, and will keep a running grade average for you on OAKS. You can log into OAKS through MyCharleston, and there are many tutorials if you have trouble familiarizing yourself on your own. Here are some YouTube links that will walk you through the basics:

- Logging in and navigating OAKS is available at <http://youtu.be/qwwktDoz9KE>
- Course Content is available at <http://youtu.be/BkT7gj5fTRk>
- Joining a Discussion is available at <http://youtu.be/gLIWZG9loU>
- Submitting Assignments is available at <http://youtu.be/wkpEbbP2csw>
- How to take a quiz is available at <http://youtu.be/IT5ToRjn8w4>

Grading:

Grade Scale	Final Grade Computation
A 93 -100 % 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 0 - 59 %	Quizzes will constitute 20% of the final grade. Other in-class and out-of-class assignments will make up another 20%. The four tests will count 15% each (60% total). The instructor reserves the right to adjust the final grade based on lack of participation during group activities.

Weekly Schedule and Relevant Readings (schedule and content is subject to change):

Week	Date	Topic	Relevant readings
1	1-7	Introduction to Genetics, Mendel	
2	1-12	Mendel and Beyond	3-4
	1-14	Probability	3.2, 3.4
3	1-19	TBD	
	1-21	Pedigree	6.1 – 6.2
4	1-26	NO CLASS—Test I available on OAKS from Sun., Jan. 24th, at noon through Tues., Jan. 26th, at 8 PM	
	1-28	Dominance revisited	5.1
5	2-2	Epistasis and Complementation	5.2
	2-4	Quantitative genetics and Complex traits	24
6	2-9	Mapping and Linkage	7
	2-11	Complex trait mapping	8
7	2-16	TBD	
	2-18	Population genetics	25
8	2-23	NO CLASS—Test II available on OAKS from Sun., Feb. 21th, at noon through Tues., Feb. 23rd, at 8 PM	
	2-25	Gene and RNA	10
9	3-1	Genetic code	13,14,15
	3-3	Transcription	16.1, 16.2, 17.1, 17.4
10	3-8	<i>NO CLASS—Spring Break</i>	
	3-10	<i>NO CLASS—Spring Break</i>	
11	3-15	Meiosis	2
	3-17	NO CLASS—Test III available on OAKS from Thurs., Mar. 17th, at noon through Sat., Mar. 19th, at 8 PM	
12	3-22	Mutation	18
	3-24		
13	3-29	Polymorphism	19.1 – 19.4
	3-31		
14	4-5	Genome structure	20
	4-7	Transposable elements	11
15	4-12	Chromosome mutations	8
	4-14		
16	4-19		
		Test IV available on OAKS from Tues. April 19th, at 1 PM through Thurs., Apr. 21st, at 11:59 PM	