



PCB 3063

Genetics

Spring 2022



Course Description and Format

In this general genetics course, we will cover eukaryotic, prokaryotic, viral, and organelle genetics. During the first half of the session we will study Genetics through the classical and cytological approaches to learn about the principles of heredity and the behavior of genes. During the second half, we will study the molecular basis of heredity. We will study the structure and replication of nucleic acids as well as the mechanisms of gene expression and regulation. We will also learn about experimental methods and their applications, ending with an introduction to DNA technology and forensic DNA analysis.

This will be a face-to-face classroom lecture course with online exams and quizzes. You will also have the option of watching recorded lectures on webcourses.

Prerequisites: BSC 2010C and CHM 2046, or C.I.

Instructor: *Dr. Walter D. Sotero*

Email: wsotero@ucf.edu

Please indicate PCB 3063
in your messages.

Section Number: 0002 (17549)

Class Meeting Times: TuTh 1:30-2:45 PM, CB2 101

Office Hours (as Zoom meetings, see page 4):

TuTh 11-12AM, or by appointment

Office Hours with *Nirav Modha* (teaching assistant):

Fr 9:30-10:45AM, Bio 202B

Course Objectives

Students should demonstrate understanding of the basic concepts of Genetics, demonstrate an ability to use information in new situations to solve problems, and be able to distinguish between concepts and draw connections. Learning outcomes include:

- Understand how the inheritance of alleles and characters relates to chromosome dynamics during meiotic cell division.
- Understand the principles of Mendelian and non-Mendelian inheritance of characters, distinguish between them, and apply this knowledge to new situations.
- Understand the concepts underlying gene mapping in eukaryotes, how it relates to chromosome interactions during meiosis, and apply this information.
- Understand inheritance and gene transfer in bacteria, and the infection cycles of the major categories of viruses.
- Understand and distinguish between the cellular processes of DNA replication, transcription, RNA processing, and translation. Be able to draw connections.
- Understand and be able to apply knowledge related to the principles of gene regulation in prokaryotes and eukaryotes.
- Understand methods of molecular genetics and their applications.

Resources and References

The online resources for this course are on **webcourses** (your PCB3063-22Spring 0002 course on <https://webcourses.ucf.edu/>). This course is organized in a series of **Modules** (find the “**Modules**” link on the menu on the left side of the home page of webcourses, and the **schedule of topics** table on page 3). Each module will contain **class notes** as downloadable PowerPoint files and a **recorded lecture**. Some modules may

contain other resources such as downloadable PDF files and links to **assignments** (exams and quizzes). You will also find all the downloadable resources in the “**Files**” link of webcourses. You may bring printouts of these files to class, or you may access them in the classroom from a laptop, tablet, or phone. As the modules are posted, you will be able to access their contents at any time.

Textbook: Genetics: A Conceptual Approach, 7th edition, by Benjamin A. Pierce. W. H. Freeman, 2017. Recommended, but not required. Available at the UCF Bookstore.

Achieve: this online product from Macmillan[®] contains animations, videos, interactive exercises, and practice questions that are chosen by your instructor to complement class instruction. ***It includes a digital version of the textbook, and it is priced much lower.*** See “Accessing Achieve” on page 4. *Recommended*, but not required. **Important:** the homework and quizzes on Achieve are meant for studying and practice purposes only and will *not* count toward your grade.

Exams and Grading

You will be taking all the exams and quizzes on webcourses. You will find them in the “Assignments” link on webcourses. You will also see links to assignment in the appropriate modules. Be sure you will have reliable internet access to take the exams and quizzes on the dates and times of the assignments and wherever you are (see “Guidelines for exam taking” on page 4). All scores will also be posted on webcourses (the “Grades” link). You will receive a score of 0 for any exam or quiz that you miss.

Exams. There will be four regular exams plus a comprehensive final exam. *Only topics covered in the lectures will be included in the exams.* All five exams will consist of fifty multiple-choice questions (2 points/question). The total for each exam will be **100** points. The lowest of your *five* exam scores will be dropped and will not count toward your final grade. For example, if you take the four regular exams and do not take the final exam, you will receive a score of 0 for the final exam but that score will be dropped and will not count toward your final cumulative score. You will receive a score of 0 for any exam that you miss, but will not count if you take the other four.

Bonus quizzes. In addition to the exams, you will also be offered two bonus quizzes that will be worth a total of 8 bonus points (2% of the grade bonus). The dates, topics, and instructions for the quizzes will be announced at later dates. You will not see the score of the bonus quizzes added to your cumulative total until after the fourth exam.

Grading. The following formula will be used to calculate your total score at the end of the semester: sum of your *four* highest exam scores plus your scores in the bonus quizzes/4. The following grading scheme will be applied to determine your final grade from your total score: 100-90%: A, <90-80%: B, <80-70%: C, <70-60%: D, <60-0%: F. No plus/minus (+/-) grades will be used in the scale. The score of the Practice Quiz (see “Documenting” on page 4) will *not* count toward your final grade. There will be no additional assignments or opportunities for credit after the final exam.

Exams Schedule

You are expected to take the exams at the scheduled dates. For each of the four regular exams, you will have a *time window* of **75 minutes** that will begin at **1:30PM** to

open the exam and finish it. Once you open an exam, you will have **60 minutes** *within the 75 minutes time window that ends at 2:30PM* to finish it. For the final exam, you will have a time window of **90 minutes** that will begin at **1PM** on May 3rd and you will have **75 minutes** to finish it. Additional time will be allowed for all the exams for students that are approved by Student Accessibility Services (SAS, see “Course Accessibility” on page 6) for extended exam time. See the "Guidelines for Exam Taking" on page 4 for more information. The following is the schedule of exams with the modules covered in each (see webcourses and the schedule of topics on this page). We will not meet in the classroom on exam days.

<u>Exam Dates</u>	<u>Modules</u>
Exam 1: February 3	1-4
Exam 2: March 3	5-8
Exam 3: March 31	9-12
Exam 4: April 21	13-16
Final Exam: May 3, 1PM	1-16

Schedule of Topics for the Spring 2022 Semester

The following schedule of topics may be subject to modifications.

<u>Modules</u>	<u>Topics</u>	<u>Chapters*</u>
1	The chromosomal basis of genes and heredity	2
2	Mendelian genetics	3
3	Sex determination	4
4	Extensions of Mendelian genetics, part 1	5
5	Extensions of Mendelian genetics, part 2	5, 24
6	Pedigree analysis	6
7	Linkage: non-Mendelian genetics	7
8	Bacteria and bacteriophage genetics/Extranuclear inheritance	9, 11
9	The genetic material	10, 11
10	The replication of DNA	12
11	RNA and transcription	13
12	Eukaryotic gene structure and RNA processing	14
13	The genetic code and translation	15
14	Gene regulation in prokaryotes and eukaryotes	16, 17
15	Epigenetics	21
16	DNA technology, genome editing, and forensic DNA profiling	19

*From Pierce, 7th edition. The actual pages from the textbook will be indicated at the bottom of the first slide of each PowerPoint file. Even within those pages you might find material that are not relevant to the course, so you are advised to study the modules before the textbook references. The schedule of topics may be subject to modifications.

Attendance

Attendance to the classroom lectures is not required. Your instructor will not keep a record of your attendance to class, and therefore you do not need to provide excuses for missing classes. Although you will have the option of watching the recorded lectures at

home, attending the classroom lectures is still strongly encouraged if you are able to. If you do attend, please show respect for the instructor and your classmates by arriving on time to class and by staying until the lecture is over. Please silence your phones or any other devices during the lectures. Do not talk on the phone in the classroom during lectures. No smoking or vaping is allowed.

The topics to be discussed in class may not be limited to those found in the textbook or class notes. *Only topics covered in class and in the recorded lectures will be included in the exams.*

Zoom Meetings

Your instructor will have Zoom meetings instead of on-campus **office hours**. The meetings (with waiting room) will take place **TuTh 10-11AM**. Also, Zoom meetings will be open during the scheduled exam periods in case you have questions during an exam.

Please familiarize yourself with Zoom by visiting the UCF Zoom Guides at <https://cdl.ucf.edu/support/webcourses/Zoom/>, where you can also get support if you experience any technical issues. You may choose to use Zoom on your mobile device (phone or tablet) or computer. Meeting dates and times will be scheduled through webcourses and should appear on your calendar. The “**Zoom**” link to the meetings is on webcourses. You may also use your UCF NID and password at <https://ucf.Zoom.us> to join the Zoom meetings or to schedule your own meetings. There will be no Zoom meetings on holidays observed by UCF.

*All the Zoom meetings are equivalent to instructor’s office hours, so attendance is entirely **optional**.*

Documenting Students’ Academic Activity

All faculty members are required to document students' academic activity at the beginning of each term. In order to comply, please take the **Practice Quiz** in the “**Assignments**” section of webcourses by 11:59 PM on the Friday of the first week of class. *Failure to do so may result in a delay in the disbursement of your financial aid.*

When taking this practice quiz, learn about the use of **LockDown Browser** (see “LockDown” on page 5). Also, make sure you can see the illustrations in this quiz. If not, try a different device. That way you will be ready to see the illustrations in the regular exams. You will be allowed unlimited attempts for the practice quiz.

Accessing Achieve

You may purchase access to Achieve for one semester. It includes a digital version of the Pierce, 7th edition textbook. To purchase, go to the “**Macmillan Learning**” tab on the left menu of webcourses, then click “**Achieve**”, and then follow the prompts to purchase it. Instructions about other ways to purchase can be found at <https://macmillan.force.com/macmillanlearning/s/article/Achieve-Join-a-course>. Once you purchase Achieve, you will have the option to access it through the same “Macmillan Learning” link on the left menu. In the event that you need to retake the course, Macmillan will grant you access for an additional term for free.

Guidelines for Exam Taking

- All the exams will be **synchronous**. *You are responsible for knowing and remembering the dates and times for each exam.*

- You will be using **LockDown Browser** in a computer (Windows or Mac) or an iPad. You may not use a smartphone. You will *not* be using Respondus Monitor.
- ***You must make sure you are using reliable internet connection.*** If you know your wifi is not always reliable, consider connecting your computer directly to the internet source, having a hotspot ready, or simply finding a location where you can take the exam confidently. Your instructor’s ability to help you if such problem is confronted during an exam is *very* limited, and you might not get a second chance to take the exam (see “Make-up exams”).
- ***Honor code:*** you may have the textbook and the class notes with you during the exams, but you must ***work by yourself.***
- ***Honor code:*** do not save or share copies in any form of the questions or answers of the exams and the bonus quizzes. Do not disseminate the contents of the exams and the bonus quizzes in any way.
- You will only be allowed one attempt per exam or quiz.
- When you take an exam or quiz, you will see one question at a time, but you will be able to go back to previous questions.
- If the time allowed to finish your exam expires before you submit it, your exam will automatically close and your answers will be saved.
- You will be able to see your exam score on webcourses after the due time.
- You will be able to see your exams after you take them during the Friday office hours
- If you take any exams or quizzes after the 60% of the term date, your status will be “finished the course” for the purpose of any inquiries from the school about your participation in the course at the end of the term. That means you will not be eligible for an “incomplete” grade, *unless you request it to the instructor before the grades due date.*

LockDown Browser Requirement

This course requires the use of Respondus® LockDown Browser for all the exams and quizzes. To get a basic understanding of LockDown Browser, please follow this link to watch a video: <https://web.respondus.com/lockdownbrowser-student-video/> (you can stop at 1:30). Learn to use this system when taking the practice quiz.

Download Instructions

- Select a quiz from the course.
- If you have not already installed LockDown Browser, select the link to download the application and follow the installation instructions.
- Return to the quiz page in a standard browser.
- LockDown Browser will launch and the quiz will begin.

Note: LockDown Browser only needs to be installed once per computer or device. It will start automatically from that point forward when a test requires it.

Make-up exams

Requests for rescheduling exams and make-up exams may be granted under special circumstances such as health issues, family emergencies, attendance to professional conferences, post-graduate school interviews, job interviews, military duties, jury duties, religious observances, or any other justified reasons approved by the school.

You may be required to produce evidence to justify your case. A request for rescheduling an exam must be made by email prior to the exam date or on the exam date at the latest.

Conflicting exams schedules are not a valid reason for rescheduling exams. The only exception for this rule is if the conflict is due to an exam time extension approved by SAS, in which case you must notify the instructor to make appropriate arrangements. Do not enroll in overlapping courses if it will result in conflicts (see the schedule of exams).

Your work schedule is not a valid reason to miss exams and will not be considered an excuse for granting make-up exams. You are expected to plan your work schedule around your obligations as a student, *not the other way around*. The current situation due to the COVID-19 pandemic does not change that. You are expected to take the exams at the scheduled dates and times along with all your classmates regardless of your work schedule. Plan your term accordingly.

Once you take an exam, your score must be counted, even if you do not finish it, and you will not be allowed to re-take it. Do not open an exam if you have an emergency that can be documented. It is important that if you become ill or have any emergency situation, you contact the instructor immediately and *before* attempting to take an exam.

Technology and equipment problems may be considered valid reasons for make-up exams and will be evaluated on a case-by-case basis, but your instructor's ability to help you if such problems are confronted during an exam is very limited. If you encounter any such problem, notify the instructor within twenty-four hours after the exam due day and time with evidence of the problem. Problems with browsers are *not* valid excuses. Make sure your browser is compatible. See the "Guidelines" on page 4.

The instructor will ultimately decide the merit of each case. It is preferable that, if justified, an exam be rescheduled for a date *before* the regularly scheduled day and time (see the schedule of exams), in which case they need to be scheduled at least one weekday in advance. A make-up exam can also be offered after the regularly scheduled exam day and time, but only if justified by properly documented reasons.

There will be no make-up bonus quizzes. You will have a twenty-four hours window of time to take a bonus quiz. If you miss a bonus quiz *for any reason*, you missed that bonus quiz.

Religious Observances. According to UCF regulation 5.020, a student who desires to observe a religious holy day of his or her religious faith must notify all of the instructors teaching the class(es) from which the student desires to be excused *no later than the tenth business day of the term*. This includes requesting rescheduling of exams. For more information about this regulation, go to <https://regulations.ucf.edu/chapter5.asp> and click on UCF-5.020.

Course Accessibility

If you believe you would benefit from special accommodations for taking exams and quizzes because of a disabling chronic physical or mental condition, you are encouraged to contact **Student Accessibility Services (SAS)**, <http://sas.sdes.ucf.edu> at 407-823-2371 or at sds@ucf.edu to explore options about accommodations such as extended exam times or a special environment to take the exams. The SAS office and testing center is located at Ferrell Commons, room 185. Other services such as notetaking and video captioning are also available through the SAS office.

Students who are deployed active duty military and/or National Guard personnel and require special accommodations such as rescheduling of exams should contact the

instructor as soon as possible after the semester begins and/or after they receive notification of deployment to make appropriate arrangements.

Privacy of Student's Educational Records

The Family Educational Rights and Privacy Act (FERPA) of 1974 is a Federal law that protects the privacy of student education records. In accordance to this law, instructors may not disclose any personally identifiable information or student's records to anyone (including parents) without the written and signed consent of the student (unless ordered by a court or in case of an emergency, if the information is necessary to protect the health or safety of the student). These include student ID number, social security number, residency status, race/ethnicity, email address, test scores, grades, GPA, academic standings, class schedule, and transcripts.

In order to comply with FERPA, instructors may not disclose information about exam scores, grades or any other personally identifiable information or records to students via email, telephone or text messages. This information can only be released to the student in person and with a valid identification.

FERPA also gives students the right to review their educational records, the right to request amendment to records they believe to be inaccurate, and the right to limit disclosure from those records. For more information about the Family Educational Rights and Privacy Act, visit <https://registrar.ucf.edu/ferpa/>.

UCF Cares

UCF Cares is a resource available to help you with your academic success and your overall well-being. It is an umbrella of care-related programs and resources dedicated to fostering a caring community of Knights. Visit <http://cares.sdes.ucf.edu> if you are seeking help for yourself or if you are worried about a friend or classmate. Free services and information are included for a variety of student concerns, including but not limited to substance abuse, sexual violence response, bias incidents, LGBTQ support, mental health concerns, financial and housing challenges, and active duty military students support and accommodations. You will find links to the Knights Helping Knights Pantry, the Just Knights Response Team, UCF Victims Services, Veterans Academic Resource Center, Housing, Health Care, Legal Services, Counseling Services, Group Counseling Resources, UCF Safe Zone, and much more. You can also e-mail ucfcares@ucf.edu with questions or for additional assistance. You can reach a UCF Cares staff member between 8 a.m. and 5 p.m. by calling 407-823-5607.

If you are in immediate distress, please call Counseling and Psychological Services to speak directly with a counselor 24/7 at 407-823-2811.

Academic Integrity

As a UCF student, you are expected to follow the standards of conduct established in the Office of Student Conduct and Academic Integrity (<https://scai.sdes.ucf.edu>). Any violations to the standards of conduct may result in judicial action, which could result in suspensions or expulsion from the University. At a minimum, violations of these rules may result in a permanent record of the infraction being placed in your degree audit.

You are responsible for knowing all course rules and policies. If any changes to the syllabus become necessary, the instructor will notify all the students about the

changes in a timely manner before they are implemented. By remaining enrolled in this class, you accept the terms and conditions of the syllabus.

The instructor has the ultimate authority to determine the correct interpretation of the contents of this syllabus.

Students are required to notify the university if they receive a positive COVID-19 test result or diagnosis by calling the UCF COVID Line at 407-823-2509. This will ensure robust tracing of cases at UCF and will help the university identify and contain potentially impacted populations.

An extended version of this syllabus, which includes expanded sections on University services, resources, and policy statements can be found on webcourses.

