



PCB 3063

Genetics

Fall 2020



Course Description

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

Instructor:

Dr. Walter D. Sotero

Email: wsotero@ucf.edu (please indicate your section in your message)

Section Number: 0002 (83308)

Instructor's Office Hours:

TuTh 1:30-2 PM (Zoom meetings, see page 4)

Resources and References

This course is organized in a series of modules (see the **schedule** on page 3). The **supplemental materials** and **recorded lectures** will be posted in the “**Modules**” section of your PCB3063-20Fall 0002 course on Webcourses (<https://webcourses.ucf.edu/>). The supplemental materials, which include the lecture notes with figures as PowerPoint files and the problem sets as pdf files, will also be posted in the “**Files**” section of your PCB3063-20Fall 0002 course on Webcourses. Once posted, you will be able to access the supplemental materials and the recorded lectures at any time.

Textbook: Genetics: A Conceptual Approach, 6th edition, by Benjamin A. Pierce. W. H. Freeman, 2017. Recommended, but *not required*. Available at the UCF Bookstore.

Sapling Learning: this online product from Macmillan[®] contains animations, videos, interactive exercises, and practice questions that are chosen by your instructor to complement class instruction. New content will be added periodically. ***It includes a digital version of the textbook, and it is priced much lower.*** See “Accessing Sapling” on page 3. ***Strongly recommended***, but not required. **Important:** the homeworks and quizzes on **Sapling** are meant for studying and practice purposes only and will *not* count toward your grade.

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 draw connections and distinguish between concepts. 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, apply this knowledge to new situations, and be able to distinguish between the different modes of inheritance.

- 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.

Exams and Grading

You will be taking all the exams on Webcourses (in the “**Assignments**” section of your PCB3063-20Fall 0002 course on <https://webcourses.ucf.edu/>). Be sure you have reliable internet access on the days and times of the exams wherever you are. Chrome and Firefox are recommended browsers to take the exams. Internet Explorer for Windows works too. Safari is not recommended. All exam scores will also be posted on Webcourses (the “**Grades**” section). You will receive a score of 0 for any exam that you miss.

Exams. There will be four regular exams plus a comprehensive final exam. *Only topics covered in the recorded 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.

Grading. The following formula will be used to calculate your cumulative score and course grade: sum of your *four* highest exam scores/4. The following grading scale will be applied: 90-100: A, 80-89: B, 70-79: C, 60-69: D, 0-59: F. No plus or minus (+/-) grades will be used in the scale. The score of the Practice Quiz (see “**Documenting**” on page 3) will *not* count toward your final grade. There will be no additional assignments or opportunities for credit after the final exam.

Exams Schedule

All the exams will begin at **2 PM**. For each of the first four exams, you will have 60 minutes to finish. For the final exam, you will have 75 minutes to finish. Additional time will be allowed for all the exams if you are approved by SAS (see “**Course Accessibility**” on page 5). The following is the exams schedule with the **modules** (see the left column of the table on page 3) covered in each.

<u>Dates</u>	<u>Modules</u>
Exam 1: September 17	1-4
Exam 2: October 15	5-8
Exam 3: November 10	9-12
Exam 4: December 3	13-16
Final Exam: December 8	1-16

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** on 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.* The score of this quiz will *not* count toward your final grade. Make sure you can see the illustration in question #1 of the practice quiz. If not, try a different device or browser. That way you will be ready to see illustrations in the regular exams. You will be allowed multiple attempts for the practice quiz.

Schedule of Topics for the Fall 2020 Semester

The term begins on August 24th and ends on December 4th.
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
9	Nucleic acids: the genetic material	10, 11
10	The replication of DNA	12
11	RNA molecules and transcription	13
12	Gene structure and RNA processing	14
13	The genetic code and translation	15
14	Gene regulation in prokaryotes	16
15	Gene regulation in eukaryotes	17
16	DNA technology & Forensic DNA profiling	19

*From Pierce, 6th edition. The actual pages from the textbook will be indicated at the bottom of the first slide of each unit (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.

Accessing Sapling

You may purchase access to Sapling in one of two ways:

- (A) Go to the course page on Webcourses (PCB3063-20Fall 0002) and click on **Macmillan Learning** on the left menu of the page. Once there click on **Sapling Learning** to create an account and to purchase access to the product (which includes a digital version of the textbook) for 1 semester for \$47.83.

Optional: If you would like to purchase a loose-leaf print copy of the textbook (in addition to access to Sapling and the digital version of the textbook for 1 semester) for an additional \$15, follow this link to the publisher's student store:

<https://store.macmillanlearning.com/us/storefront/201902443>. If you choose this option, Macmillan will send you the loose-leaf text plus a code to enter into your Sapling Learning account via the **Sapling Learning** link described above.

(B) Purchase **Genetics Sapling Access** from the UCF Bookstore. This is an access code to this course and the digital version of the Pierce textbook for 1 semester. The optional loose-leaf print textbook is available separately at the UCF Bookstore for purchase or rent.

Guidelines for Exam Taking

- All five exams will become available during the regular class time (see “Exams Schedule” on page 2).
- ***Honor code: You may have the textbook and the class notes with you during the exams, but please work by yourself.***
- You will only be allowed one attempt per exam.
- Do not save copies of any kind of the exams.
- When you take the exam you will see one question at a time, but you will be able to go back to previous questions.
- Unfortunately, because of the campus restrictions due to the COVID-19 pandemic, you will not be able to see if your answers are correct. You will not be able to see your exam score until after the due time. The instructor will not be on campus at any time this semester.
- If you take all the exams except the final, you will have completed the minimum number of assignments required for calculating the final grade from exams taken, as detailed in the grading guidelines (see “Grading” on page 2). In that case, you will be considered a “finished the course” student for the purpose of answering any inquiries from the school about your participation in the course after the end of the term. That means you would not be eligible for an “incomplete” grade. You will be considered a “finished the course” student if you take *any* five exams.
- The university will not allow us to meet in person, so it will not be possible for you to see your old exams after they are graded.

Make-up exams

Requests for make-up exams may be granted under special circumstances such as health issues, family emergencies, attendance to professional conferences, post-graduate schools interviews, job interviews, military duties, or any other justified reasons. *The instructor will ultimately decide the merit of each case.* It is preferable that make-up exams be scheduled for days and times before the regularly scheduled dates (see “Exams Schedule” on page 2), in which case they need to be scheduled at least one weekday in advance. Make-up exams can also be offered after regularly scheduled dates if justified. You will receive a score of 0 for any exam that you miss.

Zoom Meetings

Because of the continued remote instruction requirement due to the COVID-19 pandemic, this course will use Zoom meetings as a replacement for on campus office hours for student’s questions and discussion of course topics. The meetings will start at the same time we would have had face-to-face lectures on campus (**Tuesdays and Thursdays at 1:30 PM**). The meetings may run longer than the scheduled 30 minutes if necessary. Please take the time to familiarize yourself with Zoom by visiting the UCF Zoom Guides (<https://cdl.ucf.edu/support/webcourses/zoom/>). You may choose to use

Zoom on your mobile device (phone or tablet) or computer. Meeting dates and times will be scheduled through Webcourses@UCF and should appear on your calendar.

Things to Know About Zoom:

- You must sign in to my Zoom meetings using your UCF NID and password.
- The Zoom meetings may be recorded.
- Improper classroom behavior is not tolerated within Zoom meetings and may result in a referral to the Office of Student Conduct.
- You can contact Webcourses support (<https://cdl.ucf.edu/support/webcourses/>) if you have any technical issues accessing Zoom.

Course Accessibility

If you believe you would benefit from special accommodations for taking exams because of physical, mental, or psychological reasons, 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 special accommodations such as extra time.

Students who are deployed active duty military and/or National Guard personnel and require accommodation should contact their instructors as soon as possible after the semester begins and/or after they receive notification of deployment to make related arrangements.

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.

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 visit <https://www2.ed.gov/policy/gen/guid/fpco/index.html>.

Academic Integrity

As a UCF student, you are expected to follow the standards of conduct established in the Office of Student Conduct (<https://osc.sdes.ucf.edu/process/roc/>). 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 in the 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.

