



PCB 3063
Genetics
Spring 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 consider 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 discuss some experimental methods and their applications, ending with an introduction to DNA technology and forensic DNA analysis. **Prerequisites:** BSC 2010C and CHM 2046.

Instructor:

Dr. Walter D. Sotero

Office: Bio 202 B

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

Class Section: 0002 (11463)

Class Times & Room:

TuTh 1:30-2:45 PM, CB2 101

Instructor's Office Hours:

MoWe 11:30 AM-1 PM, or by appointment

Teaching Assistant: *Elliot Weinthal*

Office hours: Fr 11:30 AM-2:30 PM, Bio 202 B

Both the instructor and the teaching assistant will be available during their office hours to answer your questions, assist you with course topics, and to let you see your past exams. There is no need to make appointments to meet during scheduled office hours. You may simply show up. Contact us if our office hours do not work for you. Our office hours during the final exams week may vary.

References

Supplemental materials: all lecture notes with figures and all problem sets will be posted on Webcourses (the "Files" section of your PCB3063-20Spring 0002 course on <https://webcourses.ucf.edu/>). You may bring printouts of these files to class, or you may access them in the classroom with your laptop computer, tablet, or phone.

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. The bonus quizzes that will count toward your grade (see "Exams and Grading" on page 2) will appear on the *Assignments* section of webcourses (<https://webcourses.ucf.edu/>), not in Sapling.

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

Exams. There will be four regular exams plus a comprehensive final exam. All exams will consist mostly of multiple-choice questions, and some may also include free response questions. The total for each exam will be **100** points. You will receive a score of 0 for any exam that you miss. Make-up exams may be given under special circumstances, but the instructor will ultimately decide the merit of each case. All exam scores will be posted on <https://webcourses.ucf.edu/>.

The lowest of your *five* exam scores will be dropped and will not count toward your final grade. For example, if you take the first 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.

Bonus quizzes. In addition to the exams, you will also be offered online bonus quizzes that will add up to approximately 12 bonus points (~3% of the grade bonus). The dates, topics, and instructions for the quizzes will be announced at later dates. The quizzes will be available on the *Assignments* section of webcourses.

Final grading. The following formula will be used to calculate your cumulative score and course grade: (sum of your *four* highest exam scores, plus your scores in the bonus quizzes)/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 online Practice Quiz (see “Documenting” on page 3) will *not* count toward your final grade. There will be no additional assignments for extra credits. Because of their format, there can be no make-ups for the bonus quizzes, so be sure not to miss them.

Exams Schedule

Exam 1: February 6

Exam 2: March 5

Exam 3: April 2

Exam 4: April 16

Final Exam: April 21, 1-3 PM

Documenting Students' Academic Activity

All faculty members are required to document students' academic activity at the beginning of each semester. In order to comply, please take the **Practice Quiz** on the *Assignments* section of webcourses by the end of the first week (by 5 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.

Calendar and Schedule of Lecture Topics for the Spring 2020 Semester

The semester begins on January 6th and ends on April 20th.

There will be no class on March 10th and 12th.

The following schedule of topics may be subject to modifications.

<u>Units</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	5, 24
5	Pedigree analysis	6
6	Linkage: non-Mendelian genetics	7
7	Bacteria and bacteriophage genetics/Extranuclear inheritance	9
8	Nucleic acids: the genetic material	10, 11
9	The replication of DNA	12
10	RNA molecules and transcription	13
11	Gene structure and RNA processing	14
12	The genetic code and translation	15
13	Gene regulation in prokaryotes and eukaryotes	16, 17
14	Epigenetics (if time allows)	21
15	DNA technology & Forensic DNA profiling	19

*Pierce, 6th edition

Accessing Sapling

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

- (A) Go to the course page on webcourses (PCB3063-20Spring 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

- *If you will be taking the exams at the Student Accessibility Services (SAS) testing center, there are special additional guidelines that you will need to be aware of (see “Course Accessibility” on page 5).*
- All exams will be offered during regular class times, except for the final (see “Exams Schedule” on page 2).
- From the beginning of the regularly scheduled time, you will have an hour and twenty minutes to finish each of the four regular exams and two hours to finish the final exam.
- If you are taking the exams in the classroom, you will not need to bring your own scantrons. They will be provided.
- ***You will need a calculator for the second exam***, but it cannot be any device that can be used as a communication device.
- If you arrive late on an exam day, you will be allowed to take the exam but you will be required to finish by the scheduled time. However, *once the first student has finished the exam and left the room, no other students will be allowed in to begin the exam.*
- Please choose appropriately between right- and left-handed desks.
- You may not have any visible communication devices with you during exams. This includes phones, tablets, laptops, music players, or any similar devices.
- Know your *Student I.D. Number* for the exams (your PID, not your NID).
- Do not engage in, enable, or promote cheating, or any form of academic dishonesty.
- *Do not write the answer letters on the sides of the exam pages. This will be considered enabling cheating and will carry an automatic **2-points deduction** from your exam score.*
- Be sure you have finished filling all the bubbles for your answers and your I.D. number on your scantron before time expires. *You may not take any additional time to do this. Failure to follow this guideline may result in a **2-points deduction** from your exam score.* To avoid this, you are encouraged to complete the I.D. number section of your scantron before answering any exam questions.
- Failure to fill out the I.D. number section on your scantron (and without errors) will result in a delay in receiving your exam score.
- It is particularly critical that you fill out the I.D. number section on your scantron without errors on your final exam. If you do not, the score of the final exam *may not count* because the instructor might not be able to receive your score before the grades due deadline.
- Once the exam scores become available on webcourses you may review them during the regular office hours. Be ready to show a valid identification. However, you may not take any notes when reviewing your old exams.
- If you want to review any of your four regular exams, *you must do so before the final exam.* After that, you may only review the final exam if time permits.
- You are encouraged not to wait until the end of the term to see your exams because traffic through the office may be too high, and the office hours during the final exams week may not be convenient for you.

- If you decide not to take the final exam, you do *not* need to show up on the day of the final exam or write your name on a scantron. You will automatically get a score of zero (which will be dropped if it's your lowest score).
- 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 semester. That means you would not be eligible for an "incomplete" grade.
- *Note:* the scores of the bonus quizzes will not be added to your total cumulative score until the scores of the fourth exam are received.

Attendance

Your instructor will not keep a record of your attendance to class, but attending all the lectures is strongly encouraged. As a general rule, the students who attend lectures regularly are the ones that tend to earn better grades. The topics to be discussed in class may not be limited to those found in the textbook or class notes, and not all the sections from the textbook chapters will be covered in class. *Only topics covered in class will be included in the exams.* The bonus quizzes may include topics not covered in class.

Please show respect for the instructor and your classmates by arriving on time to class and by staying until the lecture is over. Do not walk across the classroom in front of the instructor while he is lecturing. As a courtesy to everyone in the classroom, please silence your phones or any other devices during lectures and exams. Do not talk on the phone in the classroom during lectures or exams. No smoking or vaping is allowed.

Course Accessibility

If you have any difficulties with course participation, accommodations, and/or test taking, please meet with me (your instructor) to discuss reasonable options or adjustments. Do not wait too long before asking for help if you are not doing well in the course. You could benefit from discussing alternative studying strategies.

If you believe you would benefit from special accommodations for taking exams because of physical, mental, or psychological reasons, you are encouraged to visit Student Accessibility Services (SAS, <http://sas.sdes.ucf.edu>) at Ferrell Commons 185, or contact them at 407-823-2371 or at sds@ucf.edu. Special test-taking options provided by SAS include taking the exams in a private room and being allowed extra time.

If you will be taking the exams at the SAS testing center, you need to be aware of the following additional guidelines:

- You are responsible to make sure that you are approved by SAS for the correct exam dates (the same dates specified in this syllabus). Mix-ups have occurred.
- The SAS testing center does not provide scantrons, so you will need to have your own. Your instructor (me) can provide some during office hours.
- Since you will be given extra time, you are encouraged to begin the exam up to one hour before the regularly scheduled time, whenever possible and if convenient (you will need to notify SAS in advance if you choose this option). Be aware that you would be required to stay at the testing center until no earlier than the regularly scheduled exam start time.

- If you also wish to be allowed extra time for the online quizzes, please email me (your instructor at wsotero@ucf.edu) with the request.

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, and financial and housing challenges. 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://ed.gov/policy/gen/guid/fpco/ferpa/index.html>.

Academic Integrity

As a UCF student, you are expected to follow the standards of conduct established in the *Golden Rule Student Handbook* (<http://goldenrule.sdes.ucf.edu>), a compilation of policies and procedures intended to define your rights and responsibilities as a student.

No disruptive behavior or disrespect to the instructor or to your classmates will be tolerated. Promoting or engaging in academic dishonesty in any form (*cheating* or *enabling cheating*) will be penalized. 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.

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

