



# PCB 3063

## Genetics

Fall 2018



### **Course Description**

This General Genetics course will cover eukaryotic, prokaryotic, and viral 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.

#### **Instructor:**

*Dr. Walter Sotero-Esteve*

Office: Bio 202 B

E-mail: [wsotero@ucf.edu](mailto:wsotero@ucf.edu)

Phone #: 407-823-4848

**Class Section:** 0002 (88160)

#### **Class Times & Room:**

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

#### **Instructor's Office Hours:**

TuTh 10:30-12, or by appointment

**Teaching Assistant:** *Nirav Modha*

Office hours: Fr 10-1, Bio 202 B

Both the class instructor and the teaching assistant will be available during their office hours to answer your questions and assist you with course topics. You will also be allowed to see your exams. There is no need to make appointments to meet during scheduled office hours. You may simply show up.

### **References**

**Textbook:** *Genetics: A Conceptual Approach*, 6<sup>th</sup> edition, by Benjamin A. Pierce. W. H. Freeman, 2016. Available at the UCF Bookstore.

**Supplemental materials:** all lecture notes with figures and all problem sets will be posted on Webcourses (the "Files" section of your PCB3063-18Fall 0002 course on <https://webcourses.ucf.edu/>). You may bring printouts of these files to class, or you may access them in class with your laptop computer, tablet, or other devices.

### **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 bacteria 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. The exams may include multiple-choice questions (2 points/question) and free response questions with diverse point values. Every exam will be worth a total of 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 regular exams, you will also be offered one or more online bonus quizzes that will add up to 10 bonus points (2.5% of the grade bonus). The dates, topics, and instructions for the quizzes will be announced at later dates.

**Grading.** The following formula will be used to calculate your final cumulative score and grade: (sum of your *four* highest exam scores plus your scores in the bonus quizzes)/4. Results ending in .5 or a higher decimal round up to the next whole number (meaning an 89.5 would round-up to a 90%; an 89.4 would not). The following grading scale will be applied: 90-100: A, 80-89: B, 70-79: C, 60-69: D, 0-59: F. The score of the online Practice Quiz (see “Documenting” on this page) will not count toward your final grade. There will be no additional assignments for extra credit. Because of its format, there can be no make-ups for the bonus quizzes, so be sure not to miss them.

### **Exams Schedule**

**Exam 1:** September 13

**Exam 2:** October 11

**Exam 3:** November 6

**Exam 4:** November 29

**Final Exam:** December 4, 1-2:50 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 <https://webcourses.ucf.edu/> 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 Fall 2018 Semester

The semester begins on August 20<sup>th</sup> and ends on November 30<sup>th</sup>.

There will be no class on November 22<sup>nd</sup>.

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	Population genetics	25
8	Bacterial, viral, and organelle genetics	9, 11
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 and eukaryotes	16, 17
15	DNA technology & Forensic DNA profiling	19

\*Pierce, 6<sup>th</sup> edition

### Guidelines for Exam Taking

- 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 an hour and fifty minutes 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. *If you are taking the exams at the Student Accessibility Services (SAS, see “Course Accessibility” on page 4) testing center, you will need to bring your own scantrons with you to the testing center.*
- If you will be taking the exams at SAS, you are encouraged to begin the exam one hour before the regularly scheduled time, if possible.
- Please choose appropriately between right- and left-handed desks.
- 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.*
- You may not have any visible communication devices with you during exams. This includes phones, tablets, laptops, and music players.
- You will need a calculator for the second exam, but it cannot be a communication device.
- Know your *Student I.D. Number* for the exams (your PID, not your NID).

- *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.*
- Do not engage in, enable, or promote cheating, or any form of academic dishonesty.
- 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.
- Once the exam scores become available on webcourses you may review them during the regular office hours. Be ready to show your UCF student identification. However, you may not take any notes when reviewing your old exams.
- There are no deadlines to review any specific exams, but 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.
- 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 sections from the textbook chapters will be covered in class. *Only topics covered in class will be included in the exams.* However, the bonus quiz 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 during lectures. 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. Vaping is not allowed.

### **Course Accessibility**

If you have any difficulties with course participation and/or test taking, please meet with your instructor to discuss reasonable options or adjustments. Do not wait too long before asking for help if you are not doing well or are having any difficulties. You are also encouraged to visit Student Accessibility Services (<http://sas.sdes.ucf.edu>) at

Ferrell Commons 185, or contact them at 407-823-2371 or at [sds@ucf.edu](mailto:sds@ucf.edu) to explore options about special test-taking accommodations.

### **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](mailto: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. The instructor has the ultimate authority to determine the correct interpretation of the contents of this syllabus.

