



**PCB 3023**  
**Molecular Cell Biology**  
Spring 2020



**Course Description**

During this semester, we will examine the biology of the cell. We will study its structure and function from the molecular level to the different sub-cellular components, and the regulation of different biological processes. Major topics will include genome structure and dynamics, organelle structure and function, metabolism, neurobiology, signal transduction pathways, the cell cycle, and cancer. **Prerequisites:** BSC 2010C, PCB 3063, and either CHM 2210 or CHM 2205. Certain relevant topics covered in Genetics might be reviewed briefly but will not be discussed in depth. Therefore, only students who have already completed PCB 3063 or an equivalent should take this course.

**Instructor:**

*Dr. Walter Sotero-Esteve*

Office: Bio 202 B

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

**Class Section:** 0001 (11376)

**Class Times & Room:**

MoWeFr 10:30-11:20 AM, BA1 119

**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 will be posted on Webcourses (the "Files" section of your PCB3023-20Spring 0001 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 phone.

**Textbook:** *Essential Cell Biology*, 5<sup>th</sup> edition, by Alberts *et.al.* Garland Science, 2019. *Recommended*, but not required. Available at the UCF Bookstore.

**Course Objectives**

Students should demonstrate understanding about the structures and functions of the different subcellular components of the eukaryotic cell, and how these work within the larger context of the whole cell. Students should also demonstrate understanding about the interactions between cells that lead to their regulation of functions and cell cycles. Specific learning outcomes include:

- Understand the basic functions and dynamics of the major groups of molecules of the cell.
- Understand how energy is acquired and processed by the cell.

- Understand the structure and functions of the cell membrane, with emphasis on its permeability and electrical properties.
- Understand the system of internal membranes within the context of its roles in secretory and endocytic pathways.
- Understand the ways in which cells communicate with each other, and how communication signals activate intracellular transduction pathways that lead to altered cell behavior.
- Understand the structure and functions of the cytoskeleton, with emphasis on its roles in intracellular trafficking, cell movement and muscle cell contraction.
- Understand the mechanisms of the eukaryotic cell division cycle, and how its regulation can lead to cell proliferation or programmed cell death.
- Understand how cancers develop as a consequence of failures in cell regulation.

### Exams and Grading

**Exams.** There will be five 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 **80** 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 *six* exam scores will be dropped and will not count toward your final grade. For example, if you take the first five 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 grade.

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

**Final grading.** The following formula will be used to calculate your cumulative score and course grade: (sum of your *five* highest exam scores, plus your total score for 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 this page) 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:** January 31

**Exam 2:** February 19

**Exam 3:** March 18

**Exam 4:** April 3

**Exam 5:** April 17

**Final Exam:** April 27, 10-11:30 AM

### 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 Spring 2020 Semester

The semester begins on January 6<sup>th</sup> and ends on April 20<sup>th</sup>.

There will be no class on January 20<sup>th</sup>, March 9<sup>th</sup>-13<sup>th</sup>, and April 20<sup>th</sup>.

The following schedule of topics may be subject to modifications.

<u>Units</u>	<u>Topics</u>	<u>Chapters*</u>
1	Introduction to cells	1
2	The molecules of the cell	2
3	Protein maturation and regulation	4
4	The organization of the eukaryotic genome	5
5	DNA repair, recombination, and rearrangements	6
6	The molecular mechanisms of cell differentiation	8
7	The evolution of genes and genomes	9
8	The cell membrane	11-12
9	Energy in biochemical reactions	3
10	Cellular respiration	13-14
11	Biosynthesis of cell components	13-14
12	The system of internal membranes	15
13	Cell communication	16
14	Intracellular signal transduction	16
15	The cytoskeleton	17
16	The regulation of the cell division cycle	18
17	Apoptosis and tissue renewal	20
18	Cancer	20

\*Alberts *et.al.*, 5<sup>th</sup> edition

### 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 exam (see “Exams Schedule” on page 2).
- From the beginning of the regularly scheduled time, you will have fifty minutes to finish each of the five regular exams and ninety minutes 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 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 five 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 fifth 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 or are having any difficulties.

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](mailto:sds@ucf.edu) to explore options about special test-taking accommodations.

If you will be taking the exams at SAS testing center, you need to be aware of the following 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 half hour before the regularly scheduled time, whenever possible (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](mailto: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](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. 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.

