



**PCB 3023**  
**Molecular Cell Biology**  
Fall 2021



**Course Description**

In this course 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 D. Sotero*

**Email:** [wsotero@ucf.edu](mailto:wsotero@ucf.edu)

Please indicate PCB 3023  
in your messages.

**Section Number:** 0001 (89071)

**Meeting Times:** MoWeFr 9:30-10:20AM, HS1 119

**Zoom Sessions** (see page 5): MoWe 12:30-1PM

**Office Hours** with *Nirav Modha* (teaching assistant):  
Fr 9:30AM-3:30PM, Bio 202B

**References and Resources**

You will find the references for this course on **webcourses** (your PCB3023-21Fall 0001 course on <https://webcourses.ucf.edu/>). This course is organized in a series of **Modules** (see the “**Modules**” link on the menu on the left side of the 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 the **assignments** (exams and quizzes). You will also find all downloadable resources in the “**Files**” link of webcourses. As the modules are posted, you will be able to access their contents at any time.

**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

*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 **five** regular exams plus a comprehensive **final exam**. *Only topics covered in the recorded lectures will be included in the exams.* All **six** exams will consist of **forty** multiple-choice questions (2 points/question). The total for each exam will be **80** points. The lowest of your *six* exam scores will be dropped and will not count toward your final grade. For example, if you take the 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 cumulative score. You will receive a score of 0 for any exam that you miss, but will not count if you take the other five.

**Bonus quizzes.** In addition to the exams, you will also be offered two bonus quizzes that will be worth 8 bonus points (2% of the grade bonus). The date, topics, and instructions for this quiz will be announced at a later date in an email message. You will not see the score of the bonus quiz added to the total until after the fifth exam.

**Grading.** The following formula will be used to calculate your course total and grade: sum of your *five* highest exam scores plus your score in the bonus quizzes/4 (*yes, divided by 4; that is correct!*). The following grading scale will be applied to determine your final grade: 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 be *synchronous*, so you are expected to take the exams at the scheduled dates and times along with all your classmates. **All the exams will begin at 9:30 AM** except the final exam (see the schedule below). You will have **45** minutes to finish each exam, except for the final exam for which you will have **60** minutes. Additional time will be allowed for all the exams for students that are approved by

Student Accessibility Services (SAS, see “Course Accessibility” on page 5) to receive extra time. To allow you enough time to access and open each exam, the window of time for every exam will be one minute longer than the actual time limits. 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>Dates</u>	<u>Modules</u>
<b>Exam 1:</b> September 10	1-4
<b>Exam 2:</b> October 1	5-8
<b>Exam 3:</b> October 22	9-11
<b>Exam 4:</b> November 10	12-14
<b>Exam 5:</b> December 3	15-18
<b>Final Exam:</b> December 10, 7AM	1-18

### 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**” link of webcourses by 11:59 PM EDT 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 unlimited attempts for the practice quiz.

### Schedule of Topics for the Fall 2021 Semester

The following schedule of topics may be subject to modifications.

<u>Modules</u>	<u>Topics</u>	<u>Chapters*</u>
1	Introduction to cells	1
2	The molecules of the cell	2
3	Protein structure 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

\*From Alberts *et.al.*, 5<sup>th</sup> edition. The actual pages from the textbook will be indicated at the bottom of the first slide of each unit (powerpoint file).

### **Guidelines for Exam Taking**

- All the exams will be **synchronous**, so you are expected to take the exams at the scheduled dates and times along with all your classmates. You are responsible for knowing the dates and times for each exam.
- Recommended browsers for the assignments are Chrome, Firefox, Internet Explorer for Windows, and newer versions of Safari in Apple devices.
- ***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 copies of any kind 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.
- 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.*

### **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.

***Conflicting exams schedules are not a valid reason for rescheduling exams.*** 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 "Exams Schedule" on page 2), 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.

### **Zoom Meetings**

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 take place **MoWe 12:30-1PM**, longer if necessary. Also, Zoom meetings with waiting room 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. Our Zoom meetings may be recorded. There will be no Zoom meetings on holidays observed by UCF.

*Attendance to the Zoom meetings is entirely optional.*

### **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](mailto:sds@ucf.edu) to explore options about special accommodations such as extra exam time. You will *not* be allowed extra time for exams unless you are approved by SAS.

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](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 (any data other than directory information) or student's educational 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, gender, 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 student's test scores, grades, GPA, academic standing, academic transcripts, or any other personally identifiable information or educational records to students via telephone, text messages, or email. This information can only be released to the student in person and with a valid identification. Third parties seeking student's educational records, including parents, must present a Records Release Authorization form completed by the student. This form is available at myUCF and at Millican Hall 161.

FERPA also gives students the right to review their educational records, to request amendment to records they believe to be inaccurate, and to limit disclosure from those records. For more information about the Family Educational Rights and Privacy Act, visit <https://studentprivacy.ed.gov/?src=fpc>.

### **Academic Integrity**

As a UCF student, you are expected to follow the standards of conduct established by the Office of Student Conduct and Academic Integrity (<https://scai.sdes.ucf.edu>),

which extends to exams and Zoom meetings. 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.

For more information about school regulations for students mentioned in this syllabus, visit <https://regulations.ucf.edu/chapter5.asp>.

All times indicated in this syllabus are U.S.A. Eastern Time.

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.

**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 (the “Syllabus” section).

