

Biology 313-1: Cell Biology

Course Time: Monday, Wednesday 10:00-11:15 in RITA 152

Instructor: Dr. Mark D. Lazzaro (lazzarom@cofc.edu), RITA 219, 843-953-7180

Office Hours: By appointment, just send an email.

Course Objectives:

This course focuses on the structure and function of cells. Specific topics include cell metabolism, membrane organization, organelles, compartmentation, membrane trafficking, the cytoskeleton, cell division, and cell signaling.

Student Learning Outcomes:

Students will demonstrate:

- A detailed understanding of the underlying components of modern cell biology, including cell metabolism, membrane organization, organelles, compartmentation, membrane trafficking, the cytoskeleton, cell division, and cell signaling.
- The ability to use the scientific method in obtaining, analyzing and evaluating empirical evidence for cellular structure and processes.

How to do well in this course:

Cell biology is a complicated subject. Most of you are seniors and I will expect you to work hard, come to class prepared and study effectively for exams. Attendance at lectures is required. I will expand on topics beyond what is covered in the text and you will be responsible for this material. Reading the text is required. This is a detail-oriented course and you will not do well if you never read the book. Lectures will make more sense if you read the text beforehand. If you must miss lecture, get the notes from a friend or from the website. Don't make the mistake of skipping lecture because you can get the notes to read just before the exam.

Required Text:

Hard copy or electronic access to Molecular Cell Biology, 8th edition (2016), by Lodish et al.

Recommended Materials:

Buy colored pens or pencils for your notes. I use several colors on the board during lecture.

Course Website:

Powerpoint presentations and videos are available after class on the course website. Go to OAKS, select this class, click on CONTENT.

Entry Exam:

There is a 50 question, multiple choice exam on OAKS that covers material you should know from the pre-requisite freshman biology course (BIOL 111/HONS 151). Your score on this exam counts in a low stakes way towards your course grade. You can earn up to 10 points (out of 500 for the course). Your accurate completion of the exam helps Dr. Lazzaro set the background level for the course. Go to OAKS, select GRADES, then QUIZZES.

You must complete the online exam by 10:00 AM Monday January 13.

Quizzes and Readings:

There are brief quizzes during the semester and they will be administered in class or online. The quizzes are based on the material from the previous few lectures and encourage you to stay up to date on your studying. There are online reading assignments of recent primary literature, reviews, or science news articles. You can earn up to 90 points for all the Quizzes and Reading assignments.

You may only make up a quiz or assignment with a documented excuse (ex: documented illness, interview for post-graduate program, death in the family).

Exams:

Exams are essay, short answer, and multiple choice. For Exam 1, sample questions will be on OAKS so you can see the testing style. There are four exams and each is worth 100 points. The exams are challenging and require you to know detail and think analytically. Exam material is based primarily on lecture and the related sections in the text.

You may only make up an exam with a documented excuse (ex: documented illness, interview for post-graduate program, death in the family). Do not just ask to take an exam other than that scheduled for the rest of the class. All exams count.

Grades:

Points for the course are earned as follows:

Entry Exam	10 points
Quizzes and Readings	90 points
Exam 1	100 points
Exam 2	100 points
Exam 3	100 points
<u>Exam 4</u>	<u>100 points</u>
TOTAL	500 points

Your final grade is determined as a percentage of the 500 total points as follows:

A	94-100	C	74-76
A-	90-93	C-	70-73
B+	87-89	D+	67-69
B	84-86	D	64-66
B-	80-83	D-	60-63
C+	77-79	F	0-59

Student conduct in this course is governed by the College of Charleston Honor Code. If you will require special accommodations to complete any of the reading, speaking, or writing requirements for this course, please come and see me as soon as possible. Veterans and active duty personnel with special circumstances (e.g. upcoming deployments, drill requirements, disabilities) are welcomed and encouraged to communicate these, in advance if possible, to the instructor. Please see the syllabus insert posted on OAKS to read the required official language on academic integrity and on accommodations for students with disabilities.

		Topic	Chapter Reading
W	8-Jan	1 Intro to Cells, Chemistry, Thermodynamics	1 (all), 2.1, 2.2, 2.4
M	13-Jan	2 Proteins and Enzymes	3.1, 3.2, 3.3, 3.4
W	15-Jan	3 Membrane organization	7.1, 7.2, 7.3
M	20-Jan	MARTIN LUTHER KING JR. HOLIDAY	
W	22-Jan	4 Transport across membranes	11.1, 11.2, 11.4
M	27-Jan	5 Transport across membranes	11.3, 11.5 11.6
W	29-Jan	6 Metabolism and Mitochondria	12.1, 12.2
M	3-Feb	Exam 1: Cellular Chemistry through Metabolism/Mitochondria	
W	5-Feb	7 Mitochondria-Electron Transport	12.3, 12.4
M	10-Feb	8 Mitochondria-Electron Transport and ATP synthesis	12.3, 12.4, 12.5
W	12-Feb	9 Mitochondria-Electron Transport	12.3, 12.4
M	17-Feb	10 Chloroplasts and photosynthesis	12.6, 12.7
W	19-Feb	11 Transcription and Translation	5.1, 5.2, 5.3
M	24-Feb	12 Translation	5.3, 5.4
W	26-Feb	13 Translation	5.4
M	2-Mar	Exam 2: Electron Transport through Translation	
W	4-Mar	14 Transport through Nuclear Pores	10.3, 13.6
M	9-Mar	15 Transport through Nuclear Pores, Protein targeting to organelles	10.3, 13.4, 13.5, 13.6
W	11-Mar	16 Endoplasmic Reticulum and Protein synthesis	13.1
M	16-Mar	SPRING BREAK	
W	18-Mar	SPRING BREAK	
M	23-Mar	17 Endoplasmic Reticulum and Protein synthesis	13.2, 13.3
W	25-Mar	18 Golgi-organization and protein sorting	14.2
M	30-Mar	19 Golgi-coated vesicle formation, sorting, and delivery	14.3
W	1-Apr	20 Signal Transduction	15.3, 15.5, 15.6
M	6-Apr	Exam 3: Nuclear Pores through Golgi vesicle delivery	
W	8-Apr	21 Cytoskeleton-intermediate filaments, microfilament assembly	18.7, 17.1, 17.2, 17.3, 17.4
M	13-Apr	22 Cytoskeleton-associated proteins, myosin motility, muscle cells	17.5, 17.6, 17.7
W	15-Apr	23 Cytoskeleton-microtubule assembly, associated proteins, kinesin and dynein	18.1, 18.2, 18.3, 18.4
M	20-Apr	24 Mitosis-control of the cell cycle, spindle alignment and chromosome capture	19.1, 19.3, 19.5, 18.6
W	22-Apr	25 Mitosis-chromosome alignment and separation, cytokinesis	18.6, 19.6
M	27-Apr	Exam 4: Signal transduction through Cytokinesis (9-11 AM during Finals)	