

PCB 4023 U01 and U03: Cell Biology

Course Syllabus

Fall 2015

Instructor: Dr. Laura Serbus

Class hours: Tuesday, Thursday from 9:30AM-10:45AM

Class location: Chemistry and Physics, 145

Office Hours (until changed by in-class vote): Tues and Thrs 11am-1pm, Owa Ehan 210

E-mail: lserbus@fiu.edu

Course Webpage: see Blackboard

A. Course Description:

This course is designed to train students in thinking as a Cell Biologist. Understanding and knowing mechanistic principles of cell biology is an essential part of that journey. This course will assist students in creating a sound foundation of core cell biology knowledge for themselves. A working understanding of this information empowers cell biologists to understand the claims, assess the validity, and consider the implications of experiments performed by others. This course provides training to students in integrating knowledge and critical thinking skills in practical scenarios. As many cellular processes interact with each other at the molecular level, students are further trained in synthesizing their knowledge of cell biology across topics. This provides students with an integrated understanding of the cell as a functional system. The experience of this course ultimately helps prepare students for pursuing biomedical careers as well as for independently assessing biomedical information provided by health practitioners and mass media.

B. Prerequisites:

Students taking this course **MUST** have completed and passed Genetics (PCB3063) and General Chemistry 2 (CHM1046). Note: all knowledge from these classes will be assumed.

C. Text resources:

Required for the course: Molecular Biology of the Cell, 6th edition, Bruce Alberts et al
ISBN: 0815344325 or 978-0815344322

Supplemental text (not required): Molecular Cell Biology, 7th edition, Harvey Lodish et al
ISBN: 978-1429234139 or 142923413X

D. Organization:

The course materials will be presented to the student in multiple formats. Materials will be uploaded on Blackboard for student review before and after class. However, studying the annotated notes from the website is not be enough get a good grade in the course. Students need to attend class, participate in the in-class exercises, and take notes in their own words to succeed in Cell Biology. All students must register an iClicker through Blackboard before the second week of class. Students are responsible for verifying that their clickers are functioning/recording properly in the classroom during the second week of class. There will be a minimum of 4 clicker questions per class—some based upon reading to be completed before class, and the rest based upon material covered during the

class. Students will answer as directed by the instructor, either independently or after discussing the issue with colleagues in the class. Correct answers will count for 1 point each, and incorrect answers will be scored as 0.5 points each, with a maximum accrual of 4 points per class. If we have an online assignment, the questions to be answered through Blackboard will substitute for Clicker questions. Clicker scores for the best 18/21 recorded days will count toward the student's final grade.

A small portion of the student grade is based upon "other participation". Students can earn this credit in any of several ways. One route is to post informative web links to our class Discussion board in Blackboard. These links can be to new, interesting primary research papers, or to appropriate, mechanistically correct animations of relevant molecular processes. Another route is for students to participate in voluntary in-class demonstrations. Each of those events will be recorded as 1% of the student's grade, capped at 2% for the semester. Students with a record of thoughtful interactive participation in the online Discussion board Q/A will earn the 2% credit as well. Participation by each student is expected to contribute to the group as a whole.

There are four mid-term exams and a final to be conducted during the class. These will all be in the format of multiple choice and true-false questions. The best 3 out of 4 mid-term exams will count toward the final grade. The final exam will count towards the final grade also. There are NO makeup exams. Exam answer forms presented by any student to the instructor after an exam has concluded will not be accepted. A student missing 2 or more exams will earn an automatic grade of "F" in the course. Cheating is counterproductive to mastery of Cell Biology, as it prevents students from becoming independent and empowered thinkers. Students submitting fraudulent exams in this course will be referred to the Dean of Undergraduate Education as outlined under "Academic Misconduct" in the Policies and Regulations section of the FIU Student Handbook.

E. Grading:

Standard grading scale:	A	100% - 93%
	A-	92% - 89%
	B+	88% - 87%
	B	86% - 83%
	B-	82% - 79%
	C+	78% - 77%
	C	76% - 70%
	D	69% - 60%
	F	below 59%

If the class does well overall, the final grades for the class will be determined by this scale. If the final grades indicate that less than half of the class has earned a passing grade by this scale, Serbus will consider developing an alternate grading curve at her discretion.

Each part of the course assessment contributes to the final grade, in the proportions shown here:

Three best midterm exams	20%
	20%
	20%
Final Exam	20%
iClicker credit	18%
Other participation	<u>2%</u>
Total:	100%

Scores will be posted on Blackboard.

F. Students with disabilities statement:

The Disability Resource Center collaborates with students, faculty, staff, and community members to create diverse learning environments that are usable, equitable, inclusive and sustainable. The DRC provides FIU students with disabilities the necessary support to successfully complete their education and participate in activities available to all students. Students that have a diagnosed disability and plan to utilize academic accommodations are asked to please contact the Center at 305-348-3532 or visit the DRC, located at the Graham Center GC 190.

G. Conduct:

Students are expected to contribute to a positive, productive, and focused environment in the classroom by adhering to a respectful standard of conduct. Following common-sense guidelines will maximize the overall student experience, protect student privacy, and minimize student distraction from the tasks at hand. Students are permitted to record audio from class meetings, for use in personal study time only. Students who feel strongly compelled to bring a laptop computer/tablet PC/iPad for taking notes during class are requested to sit toward the back or side areas of the classroom. Photography, video recording, and inappropriate usage of computers or mobile devices by students is prohibited. Disrupting class, such as by inappropriate conversation between students, argument with other students or the instructor, launching projectiles of any kind, etc, has no place in Cell Biology. Serbus is committed to a quality classroom environment, and retains the right to confiscate students' devices or dismiss students from the class if necessary. If a disruptive student refuses to exit the class upon being asked to do so, Serbus reserves the right to contact campus police. Special designees may be appointed to assist Serbus during regular class meetings and/or proctor exams. If present, such designees also carry full authority to ensure classroom integrity.

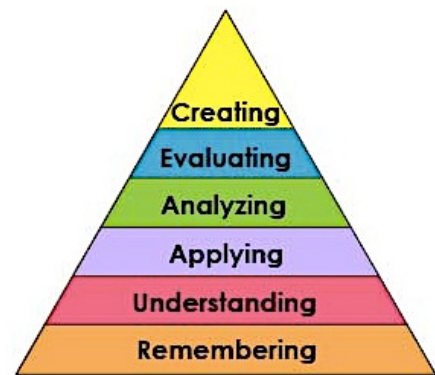
The same level of professionalism and respect applied in the Cell Biology classroom extends to our online Discussion boards in Blackboard as well. The online forum provides an important opportunity for students to work together as colleagues toward the shared goal of mastering cell biology. Inappropriate wording or imagery posted on these discussion boards will be turned over to the FIU Office of Student Conduct and Conflict Resolution, as per the Student Code of Conduct.

Some students may experience extreme stress during the course due to difficult circumstances outside of class. Serbus and students of the Cell Biology course respect the needs of students in distress, and encourage students at any time of need to contact the supportive and knowledgeable staff at FIU Counseling and Psychological Services. They are reachable by phone at (305) 348-2277, and located at UHSC270. There are daily walk-in hours there from Monday-Friday. The Dean of Students, Cathy Akens is also standing by to help students access other resources. Students can visit her office in GC219, call her at (305) 348-2797, or email her at akensc@fiu.edu. There is help out there, and students do not have to go it alone.

H. Studying:

In signing up for Cell Biology, each student accepts the challenge and responsibility of mastering the material in this course, and demonstrating his/her understanding of the material in the form of exams. This is definitely achievable when students commit to engaging the material both inside and outside of class. Reading and reviewing figures before class meetings primes students to process information the best. During class, students benefit most from attending in person, taking their own notes and actively working through the clicker exercises. Outside of class, students are strongly recommended to meet with study partners to talk through the class material, sketch out diagrams, work on/create practice problems, and question each other. Students should work through the material for this course week by week to stay current with the lectures. Additionally, it is helpful after class to read the book, review notes and online materials, solve practice problems independently, interact in the Blackboard

discussion forum, and bring questions to office hours. These combined strategies work far better than any single strategy alone or “cramming” right before an exam. Memorizing some of the concepts is necessary to develop a working understanding and confidently solve problems. Working through the material using alternate approaches next elevates the students to new mastery of the material. As per Bloom’s Taxonomy (see diagram to the right), the Cell Biology course works toward student cognition of cell biology at multiple levels. Students will know they’re getting there when they can comfortably explain the concepts in a complete form through speaking and writing, and use the information as a tool in varied practical scenarios.



Bloom's Taxonomy, adapted from:
http://ww2.odu.edu/educ/roverbau/Bloom/blooms_taxonomy.htm

I. Schedule of lecture topics and reading.

Students should check Blackboard regularly to make sure that they are updated on any changes that may occur during the semester with regard to this schedule.

On the next page is an outline of the order of topics covered and the exam schedule for this semester. The reading assignment corresponding to each topic is also shown in this schedule.

clicker?	date	day	activity	lecture #	topic	assoc reading:	pages
no	8/25	Tues	lecture/discussion	1	review basics, microscopy, fluorescent labeling	Chap 1.2, 9, 12	1-39,47-48, 534-547, 554-562, 641-643
no	8/27	Thrs	lecture/discussion	2	membranes	Chap 1.2, 3, 10	8-9, 92, 98-99, 565-585, 588-594
optional	9/1	Tues	lecture/discussion	3	membrane channels and transporters	Chap 2, 3, 11	61, 64, 92, 109-116, 586-588, 597-611, 617-619
optional	9/3	Thrs	lecture/discussion	4	endocytosis	Chap 13, 23	695-702, 730-740, 1271, 1281-1286
yes	9/8	Tues	lecture/discussion	5	protein folding, chaperonins and prions	Chap 2, 3, 6	44-45, 49-50, 57, 59-60, 92, 94-95, 109-141, 353-356
yes	9/10	Thrs	lecture/discussion	6	ubiquitin system and autophagy	Chap 6, 13, 15	357-360, 726-727, 853
online	9/15	Tues	thru Blackboard	7	the nucleus, nuclear pores, nuclear import/export	Chap 4, 6, 12	179-186, 301-320, 324-327, 329-333, 363, 649-657
no	9/17	Thrs	MIDTERM EXAM 1	--	MATERIAL COVERED FROM 8/25-9/10		
yes	9/22	Tues	lecture/discussion	8	chromatin organization and gene expression	Chap 4, 6, 7	187-194, 196-198, 200, 210-215, 301, 312, 379, 386-390
yes	9/24	Thrs	lecture/discussion	9	ER fundamentals, protein import	Chap 6, 12, 23	346-350, 669-683, skip fig 12-45, 685-686, 688-690, 1309
yes	9/29	Tues	lecture/discussion	10	ER-Golgi interaction, Golgi fundamentals	Chap 12, 13	683-684, 695-698, 710-722
yes	10/1	Thrs	lecture/discussion	11	Golgi trafficking and export	Chap 13	703-709, 727-728, 741-750
no	10/6	Tues	MIDTERM EXAM 2	--	MATERIAL COVERED ON 9/15 AND 9/22-10/1		
yes	10/8	Thrs	lecture/discussion	12	mitochondria fundamentals	Chap 1, 12, 14	25-28, 658-664, 691, 753, 755-758, 800-809
yes	10/13	Thrs	lecture/discussion	13	mitochondrial pumps/transporters	Chap 2, 14	63-68, 81-85, 753-755, 758-764, 766-774, 776-781
yes	10/15	Thrs	lecture/discussion	14	microtubule dynamics, organization	Chap 16	889-960 (centrosome/microtubule/tubulin sections)
yes	10/20	Tues	lecture/discussion	15	microtubule-based motors (interphase)	Chap 14, 16	755-756, 889-960 (kinesin/dynein sections)
yes	10/22	Thrs	lecture/discussion	16	microtubule-based motors (mitosis)	Chap 4, 16, 17	203, 934, 939, 980-992, 994-995
no	10/27	Tues	MIDTERM EXAM 3	--	MATERIAL COVERED FROM 10/8-10/22		
yes	10/29	Thrs	lecture/discussion	17	actin dynamics, organization	Chap 16	889-960, 996-997 (actin sections)
yes	11/3	Tues	lecture/discussion	18	actin structures, related motility processes	Chap 3, 16, 23	162-163, 889-960, (actin/myosin/migration), 1286-1289
yes	11/5	Thrs	lecture/discussion	19	cell junctions	Chap 19	1035-1052, 1057, 1061-1064, 1066-1081
yes	11/10	Tues	lecture/discussion	20	intro to signaling	Chap 15	813-818-822,832-836, 846-847, 874-877
yes	11/12	Thrs	lecture/discussion	21	receptor-mediated signaling	Chap 3, 15, 17, 19, 20	117-118, 822-824, 850-857, 1079-1080, 1017, 1114-1115
no	11/17	Tues	MIDTERM EXAM 4	--	MATERIAL COVERED FROM 10/29-11/12		
yes	11/19	Thrs	lecture/discussion	22	cell death	Chap 18, 20	1021-1032
online	11/24	Tues	thru Blackboard	23	cell cycle, checkpoints	Chap 17	963-973, 977-982, 985, 992-996, 1002-1003, 1010-1017
no	11/26	Thrs	no class - Thanksgiving	--			
yes	12/1	Tues	lecture/discussion	24	cancer vs. stem cells	Chap 20, 22	1091-1104, 1106-1116, 1118-1122, 1125-1126, 1229, 1246
yes	12/3	Thrs	lecture/discussion	25	cancer suppression	Chap 20	1127-1141
no	12/8	Tues	FINAL EXAM	--	CUMULATIVE FINAL EXAM, 9:45-11:45AM, CP140		