PCB 4023 U01 and U03: Cell Biology

Fall 2017 Course Syllabus -- PROVISIONAL

Instructor: Dr. Laura Serbus *Syllabus is subject to change*
Class hours: Monday, Wednesday, noon-1:15
Class location: SIPA 125
Office Hours *(first week only):* Fri 9am-1pm *(to be updated as per in-class vote)*
Office location: AHC1 219B
E-mail: Lserbus@fiu.edu
Course Webpage: see Canvas

A. What will I get out of taking this course?

This course will help you think as a Cell Biologist. The setup is designed to instill a foundation of knowledge and functional understanding of core mechanisms of cell biology. Many aspects of cellular function reappear across multiple processes. These connecting themes will be presented throughout the course, enabling synthesis of your understanding across topics throughout the semester. This course will also give you experience in assessing other people's results/claims, so you can assess the validity, and consider the implications of new data for yourselves. In practicing your critical thinking skills in practical scenarios, this course prepares you to independently assess biomedical information provided by health practitioners and mass media.

B. What prior training do I need to succeed in this course?

By now, you should have completed and passed Genetics (PCB3063) and General Chemistry 2 (CHM1046). No other science courses are required prior to enrollment in Cell Biology.

C. What text resources should I consult?

Recommended for the course: Molecular Biology of the Cell, 6th edition, Bruce Alberts et al.
ISBN: 0815344325 or 9780815344322

Supplemental practice problems (not required): Molecular Biology of the Cell, 6th edition, John Wilson and Tim Hunt. ISBN: 9780815344537

Supplemental text (not required): Becker's World of the Cell, 9th edition, Hardin and Bertoni
ISBN: 032193492X or 9780321934925

D. How is this course organized?

The course material will be presented in multiple formats. Materials will be uploaded on Canvas for student review before and after class. However, studying the annotated notes from the website is not enough to get a good grade in the course. To maximize your success, you should plan to attend class, participate in the in-class exercises, and take notes in your own words. To record your in-class participation, please register your iClicker through Canvas during the first week of class. For accuracy, plan to use an iClicker remote. This course allows but does not endorse the Reef Polling app. Reef Polling answers are not always recorded correctly, and I cannot retroactively fix those. Please verify during the second week that your clicker scores are visible to you in Canvas.
There will be a minimum of 5 clicker questions per class—some based upon reading to be completed

before class, and the rest based upon material covered during the class. Though some questions are to be answered individually, most questions allow for consulting with colleagues prior to entering your answer. Correct answers 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 Canvas will substitute for Clicker questions, also capped at 4 points. Clicker scores for the best 21/24 recorded clicker response days will count toward your final grade.

A portion of the grade is based upon posts to the Discussion boards in Canvas. Earning all 5% requires making one thoughtful Discussion post prior to each of the 5 class exams (1% each). An easy way to earn this credit is by asking a question about the material, answering questions posted by others, or posting new study tips for others. Other ways are to posts a link to an interesting research paper, a new biomedical report from a major agency (i.e. CDC or WHO), and/or by a major network news organization that is relevant to topics of our class. Another cool option is to post web links to appropriate animations of relevant molecular processes. (If the movie is cool but not mechanistically correct, explain how you think the movie should be improved as you post the link.)

The course has 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 count toward the final grade. The final exam is required. The format of exams will be responsive to class voting preferences. Given the size of our class, there are no makeup exams or late submissions of exams. Missing a single mid-term exam due to an emergency will not hurt your grade, but please be aware that missing 2 or more exams earns an automatic grade of "F" in the course. The goal of this course is to promote student growth into independent and empowered thinkers. As cheating is counterproductive to that effort, please be aware that anyone 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. What is the grading scale for this course?

Our standard scale is this:

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 the scale above. If the final grades indicate that it is appropriate to do so, 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	18% each	
Final Exam	20%	
iClicker credit	21%	
Discussion posts	5%	
Total:	100%	(All raw scores will be visible to you in Canvas.)

F. Is there any extra credit in this course?

This year, you can earn up to 2% extra credit in the course. Each well-intentioned answer to random call earns 1% extra credit. Each participation in an in-class demonstration also earns 1% extra credit. Students are permitted to bringing a hand-written index 4x6 index card to class with notes on it relevant to the exam material—submission of this card along with the exam earns 1 extra credit point on the exam.

G. What should I do if I need special accommodation?

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.

H. What are the classroom norms for this course?

In Cell Biology, students play a central part in creating a positive, productive, and focused environment in the classroom by adhering to a respectful standard of conduct. Following common-sense guidelines maximizes the overall student experience, protects student privacy, and minimizes student distraction from the tasks at hand.

Yes	**No**
Audio recording ok	Photography
Bringing laptop for typing notes ok	Video recording
Slides will be available to you thru Canvas	Web surfing/emailing/social media
Working together on clicker questions	Posting our class material to the internet
In-class demos of cellular concepts	Peanut products in class (please)
Collegial communication at all times	Disrespectful/disruptive behavior

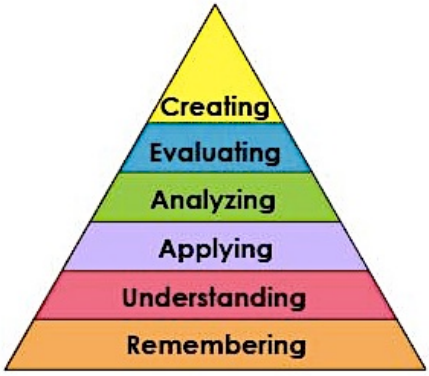
Cell Biology is a supportive environment. We will try to take a break halfway through each class for students to use the restroom, check messages and/or take any urgent phone calls. If you have a known chronic condition that occasionally requires emergency attention (i.e. epi pen, etc), please notify me and the students seated near you in class so that we can support you if needed.

The same level of professionalism and respect applied in the Cell Biology classroom extends to our online Discussion boards in Canvas. 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.

If for any reason, you experience extreme stress during the course due to difficult circumstances outside of class, Serbus and students of the Cell Biology course respect your needs. We encourage you to take advantage of services provided by 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 you access other resources. You can visit her office in GC219, call her at (305) 348-2797, or email her at akensc@fiu.edu. There is help out there, you do not have to go it alone.

I. How should I plan to study for this course?

An optimal start is to read and/or review figures before coming to class. This will prime your brain to absorb and process information during class. Then bring a copy of the slide templates to class, and add your own notes to the slides during class time. Also try to work through the clicker questions together with your neighbors during class. (Studies show that student groups alternating who speaks, rather than everyone listening passively to a single person, maximizes learning by all in the group.) Within 2-3 days of attending class, talk yourself through the notes alone or with a partner to see if the information still makes sense. By the end of the week, make sure you can explain figures from the lecture (at the same level of detail covered in class) without looking at the notes, and try out some practice problems. Consult colleagues in person and in Canvas, check out web resources and the book for alternate explanations, and come to office hours to talk things through. These combined strategies work far better than any single strategy alone or "cramming" right before an exam. As per Bloom's Taxonomy (see diagram to the right), the Cell Biology course works toward student cognition of material at multiple levels. You will know you're getting there when it's possible to comfortably explain the concepts through speaking and writing, and use the course information as a tool in practical scenarios.



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

Examples of how Bloom's taxonomy applies in the context of this class:

1. Remembering: What are the basic properties of a microtubule?
2. Understanding: Why do those properties drive a microtubule to behave as it does?
3. Applying: If you see that a chemical drives microtubules to peel apart, what does that mean?
4. Analyzing: If given raw data, can you compare/interpret microtubule responses to experimental versus control conditions?
5. Evaluating: Can you critically assess someone else's report on microtubule-related data?
6. Creating: If you wanted to find new microtubule-manipulating drugs, how would you do that?

Our in-class meetings cover the material well at levels 1, 2, 3. We also do some level 4, 5 or 6 coverage in the context of clicker questions most days, though usually not all levels on the same day. Exam questions are written with the intent of addressing understanding at multiple levels.

J. What is the schedule of lecture topics and reading?

This course works from the outside in, moving from the plasma membrane toward the nucleus, and then back out to the plasma membrane again. Regulatory mechanisms are discussed most at the end. *The specific topics and which text that informs those best is listed in the schedule below.*

Though this course is based upon the textbook, please keep this important point in mind as you go: *This course does not expect or require you to read all text to the letter.* Please use it to help solidify your understanding of the material and help clarify various points from class as well. Plan to focus most on the figures within the indicated pages. Any changes that may occur during the semester with regard to the order of topics, etc, will be posted in Canvas as notification.

Exam dates in this version of the syllabus are provisional. Please notify me immediately if you find that any of the scheduled exam dates overlap with a major religious holiday. After the first week, exam dates will be set unless a major weather event or other unexpected university closure shifts our timeline.

clicker?	date	day	activity	lecture #	topic	assoc reading:	pages
no	8/20	Mon	lecture/discussion	1	fluorescence microscopy and labeling	Chap 1,2, 9, 12	Review: 1-39, 47-48, 641-643. New: 534-547, 554-562.
optional	8/22	Wed	lecture/discussion	2	membranes	Chap 1, 2, 10	8-9, 92, 98-99, 565-585, 588-594
optional	8/27	Mon	lecture/discussion	3	membrane proteins	Chap 2, 3, 10, 11	61, 64, 92-95, 109-116, 586-588, 597-611, 617-619
optional	8/29	Wed	lecture/discussion	4	endocytosis	Chap 13, 23	695-702, 730-740, 1271, 1281-1286
no	9/3	Mon	no class-- Labor day	--	-------	-------	-------
yes	9/5	Wed	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
online	9/10	Mon	thru Canvas	6	ubiquitin system and autophagy	Chap 6, 13, 15	357-360, 726-727, 853
yes	9/12	Wed	lecture/discussion	7	chromatin organization and gene expression	Chap 4, 6, 7	187-194, 196-198, 200, 210-215, 301, 312, 379, 386-390
no	9/17	Mon	MIDTERM EXAM 1	--	MATERIAL COVERED FROM 8/20 TO 9/12	-------	-------
online	9/19	Wed	thru Canvas	8	the nucleus, nuclear pores, nuclear import/export	Chap 4, 6, 12	179-186, 301-320, 324-327, 329-333, 363, 649-657
yes	9/24	Mon	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	9/26	Wed	lecture/discussion	10	ER, Golgi and the secretory pathway	Chap 12, 13	683-684, 695-698, 710-722
yes	10/1	Mon	lecture/discussion	11	Golgi organization and function	Chap 13	703-709, 727-728, 741-750
yes	10/3	Wed	lecture/discussion	12	mitochondria fundamentals	Chap 1, 12, 14	25-28, 658-664, 691, 753, 755-758, 800-809
yes	10/8	Mon	lecture/discussion	13	mitochondrial pumps/transporters	Chap 2, 14	63-68, 81-85, 753-755, 758-764, 766-774, 776-781
yes	10/10	Wed	lecture/discussion	14	microtubule dynamics and organization	Chap 16	889-960 (centrosome/microtubule/tubulin sections)
no	10/15	Mon	MIDTERM EXAM 2	--	MATERIAL COVERED FROM 9/19 TO 10/10	-------	-------
yes	10/17	Wed	lecture/discussion	15	microtubule-based motors (interphase)	Chap 14, 16	755-756, 889-960 (kinesin/dynein sections)
yes	10/22	Mon	lecture/discussion	16	microtubule-based motors (mitosis)	Chap 4, 16, 17	203, 934, 939, 980-992, 994-995
yes	10/24	Wed	lecture/discussion	17	actin dynamics and organization	Chap 16	889-960, 996-997 (actin sections)
yes	10/29	Mon	lecture/discussion	18	actin structures, related motility processes	Chap 3, 16, 23	162-163, 889-960, (actin/myosin/migration), 1286-1289
yes	10/31	Wed	lecture/discussion	19	cell junctions	Chap 19	1035-1052, 1057, 1061-1064, 1066-1081
yes	11/5	Mon	lecture/discussion	20	intro to signaling	Chap 15	813-818-822,832-836, 846-847, 874-877
yes	11/7	Wed	lecture/discussion	21	receptor-mediated signaling	Chap 3, 15, 17, 19, 20	117-118, 822-824, 850-857, 1079-1080, 1017, 1114-1115
no	11/12	Mon	no class-- Veterans Day	--	-------	-------	-------
no	11/14	Wed	MIDTERM EXAM 3	--	MATERIAL COVERED FROM 10/17 TO 11/7	-------	-------
yes	11/19	Mon	lecture/discussion	22	cell death	Chap 18, 20	1021-1032
online	11/21	Wed	thru Canvas	23	cell cycle, checkpoints	Chap 17	963-973, 977-982, 985, 992-996, 1002-1003, 1010-1017
yes	11/26	Mon	lecture/discussion	24	cancer vs. stem cells	Chap 20, 22	1091-1104, 1106-1116, 1118-1122, 1125-1126, 1229, 1246
yes	11/28	Wed	lecture/discussion	?	*to be determined by in-class vote*	?	?
no	Week of Dec 3		FINAL EXAM	--	MATERIAL COVERED 11/19 TO 11/28, PLUS CUMULATIVE COMPONENT		