

BIOLOGY 3096 - CELL STRUCTURE, FALL, 2017 (in process - preliminary version)

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Texts:

(1) Karp, G. Cell and Molecular Biology, 8th edition. J. Wiley & Sons, publisher. This edition is not that different from the 7th edition, but does have additional online resources. I believe that either one will be fine for this course. The book will be available in the Temple Bookstore, of course, but you can also get it online. According to the publisher, You should use this ISBN, 9781119231516, for the bookstore order, which is the loose-leaf version of the book packaged with a WileyPlus code so student will be able to access the program. Also, if students are ok with no print, they can just get the WileyPlus code since it does include the full e-book and saves them some money. The ISBN for just the code is 90781118883884. The bookstore can stock some of each and give students the option.

Or: You can also use the used book market, or the international version (if you can get it). Prices and amount of yellow highlighter will vary.

Or: Students in a hurry can buy directly from Wiley, by calling Customer service 800 225-5945, and purchase with a credit card. They just need to be sure to give them the correct ISBN to get the version they want with the proper components, hard copy text, loose-leaf version of just WileyPlus access card version. If you buy directly from Wiley the price would be similar to what the bookstore charges. You can not do this through the Wiley web site. You must use the old fashioned technology of the telephone.

(2) You will also be expected to purchase a **lab manual packet** from the Copy Center, on the sixth floor of Conwell Hall or at Ritter. The lab manual includes a CD which has copies of some of the software that you will use in lab.

(3) you will need the **laboratory safety manual**, if you don't already have it,.

(4) A **Lab notebook** with carbons and removable pages.

Course Information:

This is a basic introductory course in modern cellular biology. Prerequisites include Biology 1111 and 2112, and General and Organic Chemistry. and you should have had or be taking Physics. **If you do not meet these prerequisites, you should withdraw from the course NOW.**

My goals in this course are to present the **evidence** for our present understanding of Cell Structure, and to discuss the nature of research as well as the results. For this reason, I devote a substantial portion of the course to analysis of techniques of Cell Biology and to the **history** of discovery. Naturally, this can't be done for every subject, but I try to establish an environment in which it is expected that any student might interrupt and ask me to justify any statement by citing an experiment. Similarly, this is one of the approaches that I will use in exams.

I treat the text as a resource. I expect you to be able to use it to fill in areas I might have glossed over, and to provide an explanation that might be complementary to any that I provide. **There are no formal reading assignments.** I have listed readings as a **guide** to the material. You may find additional information elsewhere in the text.

Grading will be based primarily on a class curve. About 10% of the class will receive A, 20% B, 50% C, and the rest something else. There will be two exams during the semester, each worth 20% of the final grade. The final exam will be informally divided into two parts; the first will cover the last third of the semester, and the second will be a cumulative review. The final is worth 40% of the grade. The laboratory is a required part of the course, you will receive a number grade which will count for 20% of the course grade. Thus, the maximum number of points you can accumulate from exams will be 500 (but see below for how you can get more). More details of the grading procedure will be discussed in class. **There will be no makeup exams.** If you are forced to miss one of the mid semester exams, your grade will be based on the others, as long as I receive appropriate explanations (Doctor's note, etc.). In the absence of an excuse, the exam will count as a zero. If you miss both of the mid semester exams, you should drop the course.

Because of the number of students, exams will be multiple choice. After each exam the correct answers will be posted on Blackboard. For the mid-semester exams, students who feel that their answer to a particular question is correct even though it is not the same as the posted answer may write up a detailed justification for their answer and send it to me by e-mail. Students will have two class days after the exam is returned to submit justifications for changes in the grading. Because of time constraints, I will not be able to review final exams in this way.

Since we all hate multiple choice exams, I have come up with a way to try to beat the system. Here's the deal. Each week, you should send me a single multiple choice question based on that week's material.

Provide:

- 1.. the question,*
- 2. five possible answers, and*
- 3. your choice for the correct answer*
- 4. the rationale for your answer. (you will not receive credit if this is omitted)*

*You will then receive 1 point towards your total grade for each question. You can submit only one question per week, and it must be based on that week's material. You may not accumulate questions and then submit them all at once. Questions should be addressed to a special e-mail address, jbs.questions@gmail.com, and must have "Multiple Choice" in the subject line. Since I will be collecting these automatically into a folder, they must have those words in the subject line. I will ignore any others. My purpose is severalfold. First, this is a subterfuge to force you to think about the material as it goes along. Secondly, it gives me some idea of how well you are following the course. Thirdly, it gives you the experience of designing a multiple choice question (It's not that easy!). Fourthly, it saves me a little work in making up questions, since I will use some of the questions in my exams (generally with some editing). Fifthly, if your question appears on the exam, you will already know the answer! The maximum number you can receive is 10 points. **Note, these points are not "extra credit". They will be added to your exam and lab total. Thus, the true maximum point value for the course is 510. Be aware that although the number of points is small, it sometimes makes the difference between, say, a B and a B-***

Office Hours: I will have office hours from 10-11:30 on Mondays, and 3:30-5 on Wednesdays and Thursdays. I will try to be available after most classes. . If you miss me then, please call for an appointment (204 8839), or take a chance and drop in. You can also send me a note by e-mail at jbs@temple.edu .I strongly recommend that you come at any time to discuss aspects of the course which are either difficult or exciting. My office is room 311 in the Biology- Life Sciences Building

We will be using Blackboard for posting notes, lab information and general class communication via e-mail. I hope that this will be an opportunity for you to share questions and answers with me and the laboratory staff. There will be more on this as the course progresses. I have posted a copy of this syllabus on the Blackboard site. It is also available, along with syllabi from other courses, on the Biology department web page: bio.cst.temple.edu. Navigate to Undergraduate>Courses and Syllabi. When you click on a course, if there is a syllabus, a link will appear. I will post links to supplementary information and recordings of the lectures on Blackboard, *Any student who has a need for accommodation based on disability should contact me privately as soon as possible. Also contact the office of Disability Resources at 204-1280.*

Biology 3096 - Cell Structure - Syllabus, Approximate. I may modify to include new research

A few definitions of symbols in the reading lists:
 --> from this page until the next one on the list
 ff "and pages following"

Date	Topic	Karp, 8th edition	Karp, 7th edition
Aug.28	Introduction to Cell Biology	1-30	1-26
30	Microscopes I (Resolution and EM)	693→	732→
Sept. 1	Microscopes II (Brightfield, Sections)	→	→
6	Fluorescence Microscopy, Begin Phase Contrast	→ 707	→748
8	Phase Contrast, Dark Field Principles of Molecular Organization: Bonds, http://www.chemguide.co.uk/atoms/bondingmenu.html#top	31-48	32-50
11	Water, Proteins, e.g. Antibodies ,	49→	50→
13	More on Protein Structure,	→	→
15	Antibody Structure - Self Assembly, Folding	→62, 685	→85
18	Separations :Chromatography, Size Exclusion, Ion Exchange	Lab Manual Text 711→	Lab Manual, 750→
20	Centrifugation, Electrophoresis	→721	→
22	Chromatography, Immunological Techniques, Affinity , Enzyme Characteristics I	738→740 89→	→762. 94→
25	Enzyme Characteristics II,	→	→
27	Enzyme Characteristics III	→100	→106
29	Biomembranes - History	114→	120→
Oct. 2	EXAM I		
4	Membrane Structure, - Current Concepts	→139	→147
6	Membranes II, Extracellular Matrix,	224→	235-250
9	Extracellular Matrix, Surface Modifications, Junctions, .		147→
11	Junctions ,	→256	250-264
13	Transport, Resting Potential	139→	147-169
16	“Powered Uptake” Dynamics – going in: Phagocytosis, Pinocytosis, Autophagy	→162, 293-308	308-321
18	Research Strategies – the Lysosome	291	303-304
20	Nuclear membrane, Endomembrane system, etc.,	460-468	488-493
23	Directed Assembly, Post Translational Modifications	258→	270→

25	Sorting and Targeting - Signals	→	→
27	More on Signals	→286	→318
Oct. 30	Cytoskeleton - Microtubules, Intermediate Filaments	309→	325→
Nov. 1	Muscle, Microfilaments, -Huxley	→	→
3	Motors	→	→384
6	EXAM II		
8	Excitation-Contraction Coupling , Smooth Muscle	→	369→371
10	Energetics of filament motors	→362	345→352
13	Metabolism, ΔG , Pathways	81-89, 103-105	108-117→
15	Glycolysis	105-109	178→
17	Mitochondria, Citric Acid Cycle,	168→178	→
27	Ox-Phos Solved! Photosynthesis	178-197	→234
29	Signal Pathways, Steroid Receptors, Ligand-Cell Surface Interactions I	Figure 12.47 (p 495) 582→	Figure 12,47 p524, 617→
Dec. 1	Cell to Cell Signals, Ligand-Cell Surface Interactions II,	→621	→662
4	The Cell Cycle I	540→	572→
6	The Cell Cycle II, Apoptosis	→552 621→625	-581 656-660
8	Cancer I	627→	664-697
11 (last day of classes)	Cancer II	→660	

The Final Examination will be December 20 (Wednesday) at 10:30 a.m.

IMPORTANT INFORMATION ABOUT LAB REPORTS

As you know, this class satisfies part of the University Writing requirement. As such, your lab reports are an important element in determining your grade.

Because the purpose of writing lab reports is to teach you how to analyze and present experimental results, it is necessary to write your lab reports **entirely by yourself**. Going through the mental process in which you decide what should be in the paper and how it should be phrased is how you will learn to write; if you do not make those decisions for your lab reports, you will not learn anything.

Probably the worst practice of all is to use somebody else's lab report(s) from a previous year as a guide for writing your lab report! You will not learn anything by paraphrasing or adapting someone else's work. If through SafeAssign we have reason to believe that you used a lab report (or lab reports) written by somebody else in previous years when writing your lab report, you will receive a ZERO for your efforts, regardless of how much of the report you wrote yourself. You will not have a chance to rewrite that lab report for credit. If a second lab report of yours is problematic, we will not grade any more of your lab reports for the semester.

You may discuss your results with other people, but all writing must be done individually. If through SafeAssign we have reason to believe you wrote your lab report with someone else currently in the class, we will split the score between you (divide your score in half).

No data from outside your section should appear in your lab report unless it was given to you by an instructor or posted on Blackboard for general use.

Lab Schedule. Labs begin the week of August 28

Week of:	Subject	Page	Writing Exercise/Lab Report
August 28	Introduction	3	
September 4	Microscopes I - Bright Field, Phase Contrast, and Dark Field	12	Look up published cell sizes
September 11	Microscopes II - group work		Microscopes Results & Discussion (group)
September 18	Protein Purification - Gel Filtration Column	34	
September 25	Electrophoresis - SDS-PAGE	40	Gel Filtration/SDS-PAGE Methods (in class)
October 2	Protein Purification Simulation	53	<i>lecture exam 10/2</i>
October 9	Cell Culture	80	Cell Culture Methods (in class)
October 16	Microscopes III - Fluorescence	83	Gel Filtration/SDS-PAGE lab report (first draft)
October 23	Fluorescence Microscopy Presentations		
October 30	Properties of Muscle Cells	95	Muscle Results & Discussion (individual)
November 6	Cell Fractionation I	99	<i>lecture exam 11/2</i>
November 13	Cell Fractionation II	103	Gel Filtration/SDS-PAGE lab report (final draft)
November 20	NO LABS – Thanksgiving Break		
November 27	Image Processing	114	Cell Fractionation lab report