

## BIOL 7010 SYLLABUS DRAFT

### BIOL 7010: ADVANCED CELL BIOLOGY

### SYLLABUS

Fall, 2009

(also cross-listed with BIOL 7010 Advanced Cell Biology because the lecture portion overlaps)

#### INSTRUCTORS:

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Teaching assistant:	Andrew Huang	huang@gatech.edu

**COURSE HOURS/LOCATION:** MWF 10:05-10:55am/ Architecture (East) 123

**OFFICE HOURS:** No regular office hours are scheduled, but students are **STRONGLY ENCOURAGED** to meet with the TA and instructors when needed by arranging a time via e-mail.

**COURSE DESCRIPTION:** Modern cell biology is a unifying discipline that combines genetics, biochemistry, and molecular biology with traditional morphological descriptions to study how cells function at the molecular level. This course will introduce students to the dynamic relationship between the structure of cellular organelles and the numerous biochemical reactions that are necessary for cell growth and survival with an emphasis on eukaryotic cells. The **FORMAT** of the course will consist of class lectures, which primarily draw on information found in the textbook, and for those taking the laboratory, exercises that illustrate some commonly-used research techniques and their application during a semester-long research project. In addition, students will be required to participate in analysis of assigned research articles, including a **GROUP ORAL PRESENTATION** or a **WRITTEN SYNOPSIS/ANALYSIS/CRITIQUE**. It is estimated that **1-2 hours** will be required outside of class to prepare for EACH lecture, and each research paper will require additional hours of study/preparation.

**TEXTBOOK:** Lodish H., Berk A., Kaiser, C.A., Krieger, M., Scott, M. P., Bretscher, A., Ploegh, H. and Matsudaira P., 2007. *Molecular Cell Biology*, 6th Ed. W.H Freeman and Company (ISBN-13: 978-0-7167-7601-7). Optional reading (on reserve in the library): Gillen, C. M., 2007. Reading Primary Literature, Pearson/Benjamin Cummings Pub. (ISBN-13: 978-08053-4599-5).

**OTHER SOURCES:** The website for the textbook: <http://bcs.whfreeman.com/lodish6e/default.asp>  
Biomedical search tools: NLM Gateway, <http://gateway.nlm.nih.gov/gw/Cmd> and Google Scholar  
Online journals via the Georgia Tech library: [http://sfx.galib.uga.edu/sfx\\_git1/azlist/sfx\\_git1](http://sfx.galib.uga.edu/sfx_git1/azlist/sfx_git1)  
Link to useful online cell biology resource: <http://www.cellbio.com>

**CLASS CONTACTS:** We suggest you obtain contact information from a few of your classmates in case you are absent from class and may obtain class notes and information from these contacts.

#### IMPORTANT GEORGIA TECH DATES

Mon	<b>Aug 17</b>	CLASSES BEGIN
Mon	<b>Sep 7</b>	OFFICIAL SCHOOL HOLIDAY
Sat-Tues	<b>Oct 3-6</b>	Fall 2009 Student Recess
Fri	<b>Oct 16</b>	Last day to withdraw from individual courses with a grade of "W"
Thur-Fri	<b>Nov 26-27</b>	OFFICIAL SCHOOL HOLIDAY
Fri	<b>Dec 5</b>	LAST DAY OF CLASSES
Mon – Fri	<b>12/7-12/11</b>	FINALS WEEK

#### IMPORTANT COURSE DATES

FRI	<b>Sep 2</b>	EXAM 1
Mon	<b>Sept 28</b>	EXAM 2
Fri	<b>Oct 23</b>	EXAM 3
Fri	<b>Nov 20</b>	EXAM 4
TUE	<b>Dec 8</b>	FINAL EXAM CUMULATIVE

## **BIOL 7010 SYLLABUS DRAFT**

**IMPORTANT INFORMATION ABOUT HONOR CODE:** All students are required to adhere to the Georgia Tech Academic Honor Code ([www.honor.gatech.edu](http://www.honor.gatech.edu)). This includes, but is not limited to, the following issues that pertain to the oral and written critiques, mnemonic tools, and exams for this class:

1. Plagiarism is not allowed. Plagiarizing is defined by Webster's as "to steal and pass off (the ideas or words of another) as one's own; use (another's production) without crediting the source."

In simpler terms: When you use any phrases, sentences, etc. verbatim from another source, they must be identified by quotation marks and citation of the source. In scientific writing, it is generally preferable to rephrase information from other sources and cite the source rather than use the same text, even when you offset the text with quotation marks. When you show diagrams, models and other materials that are not your own, the sources must also be identified.

These rules apply both to published information and information that you might receive from another student, website, previous class report, etc.

Plagiarization will be dealt with according to the GT Academic Honor Code.

2. Students are encouraged to collaborate in some aspects of the preparation of oral and written critiques, such as the early stages where you are achieving an understanding of the assigned papers; however, the final critiques must be written by each student alone.

For team oral presentations, students may collaborate in all aspects of the work, indeed, it is expected that all will contribute equally to the final product and that they will share the single grade that is awarded for the ppt presentation. Students may use copyrighted figures, etc. from publications in the ppt presentation if appropriate citations are given because the ppt will only be posted on access restricted WebCt website. However, if the team uses multiple copies of any copyrighted items (such as the pdf file of a copyrighted article), each student shown download their own copy from the Georgia Tech library website rather than for one student to distribute the pdf.

In the event the assigned paper has been used by a previous class, students are not allowed to use any of the ppt slides in whole or part that were prepared by the other class.

3. Unless specifically identified as group work; quizzes, tests, take-home-tests, homework, etc. are to be completed alone.

4. For Quizzes/Tests: Cheating off of another person's test or quiz is unethical and unacceptable. Cheating off of anyone else's work is a direct violation of the GT Academic Honor Code, and will be dealt with accordingly.

5. Because the exams for this course change every semester, students may use old tests as study tools.

**For any questions involving these or any other Academic Honor Code issues, please consult the professors, teaching assistant, or [www.honor.gatech.edu](http://www.honor.gatech.edu).**

**POLICY REGARDING LAPTOP USE IN CLASS:** Students are welcome to bring laptops to class to use for note taking, looking up related information on the internet, etc.

**LAPTOPS MAY NOT BE USED DURING CLASS TO SEARCH INFORMATION NOT RELATED TO THE CLASS** (Facebook, etc.)—This regulation will be enforced by the TA because images on a laptop screen that are unrelated to the course content are often distracting to other students. If you are awaiting an important message that must be received during class, sit on the last row of the classroom so you will not be distracting to the other students.

## BIOL 7010 SYLLABUS DRAFT

### EVALUATION CRITERIA:

**Exams: 60%** There will be FOUR lecture exams and one FINAL EXAM (see exam schedule above). **Your lowest LECTURE EXAM score will be dropped.** Each of the remaining exams and the final exam is worth 15% of the final grade. All lecture exams will be closed book and will consist of multiple-choice and short answer questions.

**NO Makeup exams will be given so try to take all exams in case you miss one due to illness.**

**NOTE: THE FINAL EXAM IS MANDATORY AND CANNOT BE DROPPED!**

**Student Presentations and Participation: 40%** The class will be divided into small groups (the first two will be the students taking BIOL3341 lab, because they will more easily meet with Dr. Merrill to prepare critiques that can serve as examples for the rest of the class). Students in each group have the option of preparing a group oral presentation/critique of the assigned research paper or individually to prepare a written critique. The oral presentation should be presented in PowerPoint, and must be timed to finish in 25 to 30 min to allow time for questions and discussion. **The first page of the ppt file for the presentation should give the names of all of the students in the group and the statement that: “The preparers of this presentation agree that it can be posted on t-square for use by other students in the class only. None of the material may be reproduced or used for other purposes because it may be covered under copyrights from the original sources.”** A single grade will be assigned for the entire group, so the group should prepare and rehearse it early (in the rare event that a member of a group is having difficulty with his/her portion of the presentation, and the others need to help). At the discretion of the instructor and in consultation with the oral presenters, the oral presentation may be conducted as a debate to ensure that all of the members of the group present orally as well as to increase class interest and participation.

Graduate students are required to prepare two reports, at least one of which must be a written report, which is a 2 page analysis/critique of some aspect of the paper (for examples: Was one of the methods used incorrectly? Did the authors misinterpret the data in a figure or table? Did the authors overlook an important paper already in the literature that would have affected their conclusions?). These students are expected to provide documentation for their comments from the scientific literature (in a bibliography with 5-6 references from the peer-reviewed research literature) and will be expected to participate in the question and answer period for the oral presentation. Additional instructions about the critique will be provided in class.

**Extra credit:** A number of extra credit opportunities will be provided during the semester. These points will be added to the sum for the course (therefore, 5 extra credit points would be equivalent to adding 1 point to each exam and the paper critique). These are:

- a) attendance at each oral presentation (documented by turning in one question on the paper and an evaluation sheet for that presentation) will be awarded 1 point for each paper (total, 7 points);
- b) completion of the course evaluation at the end of the semester will also earn extra credit (3 points);
- and,
- c) certain lectures will have 5-10 minutes in class “questions and discussion” session, additional extra credit points will be awarded for participation in these activities.

### CALCULATION OF FINAL GRADE:

The final grade is assigned by the scale: A=  $\geq 90$ ; B=  $\geq 80$ , C=  $\geq 70$ , D=  $\geq 60$ , F=  $< 60$  (grades are not “curved”).

Your average for the course = [(Average of the scores on 3 exams—i.e., having dropped the exam with the lowest score)  $\times 2$  + (Score on the final exam) + (Sum of the 2 paper critique scores) + (Sum of extra credit)]/5

Fractions are rounded to the nearest number (e.g., 79.6  $\rightarrow$  80).

**BIOL 7010 SYLLABUS DRAFT****Syllabus for BIOL3340/7010****Fall, 2009**

<b>Class #</b>	<b>DAY</b>	<b>DATE</b>	<b>Chap</b>	<b>LECTURE TOPIC</b>	<b>Lecturer</b>
1	MON	17-Aug	1 & 2	Introduction & Chemical Foundations	AM
2	WED	19-Aug	2	Chemical Foundations	AM
3	FRI	21-Aug	3	Protein Structure and Function	AM
4	MON	24-Aug	4	Basic Molecular Genetic Mechanisms	YF
5	WED	26-Aug	4	Basic Molecular Genetic Mechanisms	YF
6	FRI	28-Aug	5	Molecular Genetic Techniques and Genomics	YF
7	MON	31-Aug	6	Genomics and Chromosomes	YF
8	WED	2-Sep	7	Transcriptional Control of Gene Expression	YF
8	FRI	4-Sep		EXAM 1 (Chap. 1-6)	AM/YF
9	MON	7-Sep		OFFICIAL SCHOOL HOLIDAY	
10	WED	9-Sep	7	Transcriptional Control of Gene Expression	YF
11	FRI	11-Sep	8	Post-transcriptional Gene Control	YF
12	MON	14-Sep	9	Visualizing, fractionating and culturing cells	AM
13	WED	16-Sep	10	Biomembrane Structure	AM
14	FRI	18-Sep		FIRST STUDENT PRESENTATION	AM
15	MON	21-Sep	11	Transmembrane transport of ions & small molecules	AM
16	WED	23-Sep	12	Cell Energetics	AM
17	FRI	25-Sep		SECOND STUDENT PRESENTATION	YF
18	MON	28-Sep		EXAM 2 (Chap. 7-12 & Student Presentations 1-2)	AM/YF
19	WED	30-Sep	13	Moving Proteins into Membranes and Organelles	AM
20	FRI	2-Oct		THIRD STUDENT PRESENTATION	AM
	MON	5-Oct		OFFICIAL SCHOOL HOLIDAY	
21	WED	7-Oct	14	Vesicular Traffic, Secretion, and Endocytosis	AM
22	FRI	9-Oct		FOURTH STUDENT PRESENTATION	YF
23	MON	12-Oct	14	Vesicular Traffic, Secretion, and Endocytosis	AM
24	WED	14-Oct	15	Signaling I	AM
25	FRI	16-Oct		FIFTH STUDENT PRESENTATION	AM
		16-Oct		Last day to drop individual courses(s) with a grade of "W"	
26	MON	19-Oct	15,16	Signaling II	AM
27	WED	21-Oct	16	Signaling II	AM
28	FRI	23-Oct		EXAM 3 (Chap. 13-16 & Student Presentation 3-5)	AM/YF
29	MON	26-Oct	17	Microfilaments and Intermediate Filaments	AM
30	WED	28-Oct	17,18	Microfilaments, IF & Microtubules	AM
31	FRI	30-Oct	18	Cytoskeleton II: Microtubules	AM
32	MON	2-Nov	19	Integrating Cells into Tissues	AM
33	WED	4-Nov	19	Integrating Cells into Tissues	AM
34	FRI	6-Nov		SIXTH STUDENT PRESENTATION	YF
35	MON	9-Nov	20	Regulating the Eukaryotic Cell Cycle	YF
36	WED	11-Nov	20	Regulating the Eukaryotic Cell Cycle	YF
37	FRI	13-Nov		SEVENTH STUDENT PRESENTATION	YF
38	MON	16-Nov	21	Cell Birth, Lineage, and Death	YF
39	WED	18-Nov	21	Cell Birth, Lineage, and Death	YF
40	FRI	20-Nov		EXAM 4 (Chap. 17-21 & Student Presentations 6 & 7)	AM/YF
41	MON	23-Nov	22	Molecular biology of development	YF
42	WED	25-Nov	23,24	Other complex cells: Nerve cells & the immune system	YF
	FRI	27-Nov		OFFICIAL SCHOOL HOLIDAY	
43	MON	30-Nov		EIGHTH STUDENT PRESENTATION (if needed)	TA
44	WED	2-Dec	25	Cancer	AM
45	FRI	4-Dec		Course Wrap-up	AM/YF
46	TUE	8-Dec		FINAL EXAM (11:30 – 2:20 pm)	AM/YF
				50%: Chap. 22-25 & Student Presentation 8	
				50%: Questions from the rest of the semester	