Cell & Molecular Biology, BIOL 3450 SYLLABUS Spring 2015

INSTRUCTORS (contact by e-mail recommended over telephone):
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COURSE HOURS/LOCATION: MWF 10:05-10:55 am/ Molecular Sciences & Engr G011

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 describes the structure and function of cells in all their genetic, biochemical, developmental, physiological and pathophysiological aspects. This course will introduce students to the dynamic relationships between cell structure and the biochemical reactions that are necessary for cell growth, differentiation, survival and death 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), **in-class discussion of topics related to the lecture material**, and **analysis of assigned research articles**, with each student preparing a **WRITTEN SYNOPSIS/CRITIQUE** of one research paper (or, for a few volunteers, preparing an **ORAL PRESENTATION** as part of a small team—see description of this later in the syllabus). When possible, the instructors will interject exercises using the Turning Point "clickers." It is estimated that 1-2 hours will be required outside of class to prepare for EACH lecture, although some students might need to commit more time, and each research paper will require additional hours of study/preparation.

TEXTBOOK: H. Lodish et al. 2012. *Molecular Cell Biology, 7th Ed.* W.H Freeman and Company, and Turning Point transmitter or mobile device app. 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; Biomedical search tools: PubMed (and Google Scholar) http://www.ncbi.nlm.nih.gov/pubmed/. Online journals via the Georgia Tech library: http://sfx.galib.uga.edu/sfx_git1/az (and link "Citation Linker" on that web site). Link to useful online cell biology resource: http://www.cellbio.com

COMPLEMENTERY CELL BIOLOGY LEARNING EXPERIENCES: Occasional discussions and internet exercises that explore and expand cell biology concepts and practice will be held outside of class. These are not required, nor provide bonus credit, but some students might find that this helps them learn the material. The dates, times and meeting places will be announced during the semester.

CLASS CONTACTS: We strongly suggest that you get to know at least a few other students in the class so you can help each other with questions, studying, etc.

IMPORTANT GEORGIA TECH DATES

Mon	**Jan 5**	CLASSES BEGIN
Mon	**Jan 19**	OFFICIAL SCHOOL HOLIDAY
Fri	**Feb 27**	Last day to withdraw from individual courses with a grade of "W"
Sat-Tues	**Mar 16-20**	SPRING BREAK
Fri	**Apr 24**	LAST DAY OF CLASSES
Mon – Fri	**Apr 27–May 1**	FINALS WEEK

IMPORTANT COURSE DATES

WED	**Jan 28**	EXAM 1
FRI	**Feb 20**	EXAM 2
FRI	**Mar 13**	EXAM 3
MON	**Apr 13**	EXAM 4
MON	**Apr 27**	**FINAL EXAM (CUMULATIVE); 11:30am - 2:20pm**

EVALUATION CRITERIA:

***Lecture exams*: 60% of the final grade (300 points total).** There will be FOUR closed-book exams during the semester. Each will consist of multiple-choice and short answer questions. **Your lowest score will be dropped**, so each of the remaining exams is worth 20% of the final grade. If you are participating in an excused activity (scientific conference, sports event, etc.) that causes you to miss an exam, the instructors will try to schedule for you to take it early, but you must arrange when (which is usually the day before the scheduled exam date) at least two weeks before the scheduled exam date. If it is not possible to schedule a time for you to take the exam early (or you elect not to do so), the one you miss will be counted as the dropped exam.

> **NO Makeup exams will be given so try to take all exams in case you miss one due to illness or another unexpected interruption.** If you have a more prolonged illness (or several) that cause you to miss more than one exam, you should contact the Dean of Students office to certify the illness(es) and the Dean will inform us that some sort of accommodation would be appropriate.
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> **IF YOU HAVE A COLD or OTHER MINOR, POTENTIALLY COMMUNICATIBLE ILLNESS DURING AN EXAM OR OTHER CLASS WHEN ATTENDANCE IS REQUIRED**: Please let the teachers know so they can try to find a way for you to participate far enough away from other students to minimize its spread (for example, in the hallway). If you are seriously ill, do not come to class.

***Final exam*: 20% of the final grade (100 points total).** THE FINAL EXAM is an integrative overview of all of the cell biology concepts covered in the course (not just the chapters since exam 4, but also the earlier material). The final exam cannot be dropped.

***Research paper analysis*: 20% of the final grade (100 points total).** This activity gives students experience in reading and discussing primary, peer-reviewed research papers in molecular and cell biology to familiarize them with how research in this area is conducted and reported. Four papers will be discussed in depth during the semester, and each student will responsible for the aspects of the papers that are discussed in class (there will be a few questions on the exams from this material) ***and* preparing a WRITTEN report on ONE of the papers.** Early in the semester, the instructors will create a sign-up site on T-square where students can express their preference for the paper that they will analyze for this report (each will have enough sign-up slots for approximately 1/4 of the class, so if you have a strong preference for which paper you use for your written report, sign up early).

The written report (**15% of your final grade; 75 points**) will be a 2-page summary of the paper including an analysis/critique of some aspect of the paper. In general, the first half of the report will be similar to the abstract of the paper but with additional background information, more specifics about the experiments that were done, and key results. The second half of the paper will discuss some aspect of the paper that the student considers to need improvement (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?), or if the work is judged to be solid, a discussion of how the findings might be built on by follow-up experiments. These students are expected to provide documentation for their comments on all aspects of the paper (background, key methods, discussion of the results, etc.) **by citing pertinent papers from the scientific literature** (and putting these in a bibliography with **at least 5-6 references** from the peer-reviewed research literature). The grading rubric that is used by the instructors will be posted on T-square so students should take care to include information in all of the categories that are scored. The report must be turned in at the beginning of the class that it is due; if late, the score will be reduced 10 points (one letter grade) per day it is late.

The in-class discussion (**5% of your final grade; 25 points**) of the papers will follow this general outline: a) the instructors will distribute a list of the major issues/questions about the paper that they want the class to notice and discuss; b) there will be a 15-minute overview of the main points in the paper to orient everyone to it; c) approximately 15 min will be allocated for students to use the understanding that they have gotten about the paper from this overview plus the paper itself to arrive at answers for the major issues/questions provided by the instructors; and d) the last 15 min of the class will be used for discussion of these

issues/questions. After this discussion, the students will hand in the bottom section of the list distributed by the instructor as a record of participation; student feedback on the paper will also be collected via this document and/or clicker responses. Since there are 5 papers, each will be worth 5 points (1% of the final grade). If you are absent for a paper discussion, there will be an opportunity to make up the points under the "extra credit" opportunities explained later in the syllabus).

Student volunteers for the 15-minute overview of the paper: The overviews of the papers at the beginning of the class discussions are usually more interesting when given by small teams of students who volunteer to do this (if none volunteer for a particular paper, the instructors will introduce the paper). One advantage for students who participate in the in-class overview is that they do not need to submit a 2-page written review; however, the preparation usually takes the same effort (and sometimes more—although students who invest this time usually report that it was worth it). Some more details about how to present the paper are given below. If you are interested in doing this, we recommend that you form your team (6 to 8 students, max) and contact the instructors stating that you would like to give the overview as soon as possible after the papers are posted. If more than one team volunteers, we will correspond with the team leaders (i.e., the person(s) who initiate the contact with us) to try to ascertain who might do the better job, since this presentation is important for the entire class. In the event of a tie, the group will be selected randomly.

Organization of the in-class overview of the research papers: The team that prepares the overview for presentation in class should use PowerPoint to summarize the background, hypothesis, methods, results, and discussion of the paper. The first page of the ppt file for the presentation should give the name of the paper (title, authors, journal, etc.), and the names of all of the students in the group. **It should also have a 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."** Next, there should be 2 to 3 slides summarizing the background for this paper and its hypothesis, 2-3 slides explaining key methods; 4-5 slides showing key data; 1-2 slides summarizing the conclusions; 1-2 slides stating some concerns and directions for future work; and a bibliography of at least 5 research papers used in analysis of this paper and the points you have raised (additional references to web sites and other information sources can be added, but the bibliography must contain 5 references from research journals). Be careful to include only the most essential points in each slide since the entire presentation must be made in 15 minutes. A copy of the grading template is posed on T-square so students will know what is considered to be most important for them to cover. 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). The instructors hope the teams will consult them during the preparation of the overview, and show them a draft of the Powerpoint presentation. The instructors are willing to make suggestions for improvement of the presentation, but to ensure that they have time to do so, you need to contact them well in advance of the presentation date.

Extra credit opportunities: There are several ways that students can contribute to the course and when these are done, the points are recorded as "extra" credit—i.e., the points are added to the sum for the semester. A maximum of 15 points can be earned using the options below (which is equivalent to adding 15 points to a single exam score, or 3 points to the final grade average). You may continue to participate in the discussions beyond this, but you will not receive extra credit for the participation (the only exception is where you can use points to offset points you lost because you missed one or more in-class discussion of a research paper—see discussion of these points at the end of this section).

1) Participation in organized in-class discussions or a spontaneous discussion: As often as possible, the instructors will supplement the lectures with discussions of topics related to the course material. One example that will be used throughout the semester will be to use the research paper "Ex vivo culture of circulating breast tumor cells for individualized testing of drug susceptibility" (Min Yu et al., Science 345, 216 (2014); DOI: 10.1126/science.1253533) to illustrate how the information in this course will enable you to understand new discoveries as they occur.

If feasible, some of the discussions will be conducted as "clicker exercises." Whether the discussions are conducted with or without the use of "clickers," the goal will be to help students relate to the information

presented in class as active participants rather than just listeners, and to give the instructors feed-back on whether the learning objectives are being accomplished. Typically, the instructor will present a series of questions or problems related to the topics covered in class; students will formulate possible answers/solutions, which will then be discussed orally and/or by "clicker" feedback. There will be no "make up" opportunities for these in-class activities, but if a clicker devise is used and you do not have one (or it is malfunctioning), you will be able to fill in a form in class that lets the TA know that you have participated.

In addition to these discussions that are initiated by the professors, students may contribute to the effectiveness of the class by bringing in an outside connection, asking a particularly thoughtful question that adds to the learning experience for the class, etc.

If you participate in these ways, you will be awarded 1 point per participation (keep in mind that your total extra credit points for the semester can only sum to 15 points) if you notify the TA of your participation ON THE SAME DAY as it occurs. If you forget, we cannot award these points to you later in the semester because we will not remember if you actually participated.

To inform the TA of your participation, fill-in in class (or e-mail on the same day) the following information (this can also be downloaded from T-square as the **"I participated" form):**

Student name: **Date:**

I participated in today's class in the following manner: (fill in with enough information for the instructor to remember what you did and recognize that you deserve acknowledgement for this participation).

If we agree that your participation qualified for the point, it will appear in the gradebook on T-square within approximately one week from when it is earned.

2) Attending the Festival of Research Ideas in Cancer Biology and Technology on November 20 from 5 to 7 pm. This event will be held in the atrium of the IBB and you will be given instructions about what is needed to qualify for extra credit near the date of this event (this is usually worth 2 to 3 points).

3) Near the end of the semester, if >60% of the class performs the on-line course critique, everyone in the class will receive 1 point; if >80% reply, everyone will earn 2 extra credit points; if >90% reply, everyone will receive 3 extra credit points.

4) The instructors might add a few other extra credit opportunities, such as to attend and report on a major conference or seminar at Tech related to class, etc. If these become available, they will be posted as announcements on T-square.

Comment about the use of "extra" credit to make up for missed in-class participation: If you miss an in-class discussion of a research paper (each of which is worth 5 points), 5 points of "extra" credit points can be used to offset this deficiency. These do not count against the total of 15 points of extra credit that you can earn, so if you earn 20 points of "extra" credit, 5 could be used to offset the missed in-class participation and the other 15 would remain "extra" credit points.

CALCULATION OF FINAL GRADE:

Your average for the course is calculated as follows:

Sum of the scores on 3 of the 4 lecture exams—i.e., having dropped the lowest lecture exam score
(max number of points = 3 x 100)
+
Score on the final exam (max number of points = 1 x 100)
+

Sum of scores from the paper analysis (75 pts max) and participation in in-class discussions of the research papers (25 points) (max number of total points = 100)

+

Sum of "extra" credit points (max 15 points)

The sum of the above (max # of points = 500 + extra credit)/5 = score used to compute final grade.

The letter grade is assigned by the scale: A= ≥90; B= ≥80, C= ≥70, D= ≥60, F= <60. Grades are not "curved," but fractions are rounded to the nearest number (e.g., 79.6 -> 80).

Comment about not curving the grades: the instructors examine the class responses to each question of each exam and if we discover that performance was lower than expected on a given question due to deficiencies in the design of the question, we adjust the points immediately and inform the class when the exam grades are posted.

If you disagree with the points that have been awarded to you on an exam or your written report: you should report this to the TA within a week after you have received the grade to determine if the error was merely a miscalculation. If you disagree with the number of points that have been awarded by the TA, you should contact the instructor who prepared the question (or assigned the paper) within two weeks (thus, you have one week to check with the TA first, then another week to consult the professor, if you deem necessary). You are welcome to do this, however, you should examine your answers carefully first. TA's sometimes give more points for an answer than the instructor would, so review of your answers by the instructor might reduce your grade rather than increase it, if your argument for why your grade should be higher is not strong.

POLICY REGARDING LAPTOP, TABLET and SMARTPHONE USE IN CLASS: Students are welcome to bring such devices to class to use for note taking, looking up related information on the internet, etc. Indeed, we encourage students to look up related topics on Pub Med or another scientific search engine if hearing about a topic in class stimulates interest in learning more about it than is covered in class.

HOWEVER, THESE DEVICES MAY NOT BE USED DURING CLASS TO SEARCH INFORMATION NOT RELATED TO THE CLASS (Facebook, etc.)—This regulation will be enforced by the TA (who sits at the back so the content on screens can be seen), possibly resulting in a subtraction of points from the in-class-participation grade. This rule is important because screen images that are unrelated to the course content are often distracting to other students.

The instructors realize that there might be special instances where you need to receive an important message during class. If this applies, sit on the last row of the classroom so your activities will not distracting to other students.

Other important comments related to this course. This course is taught at a "3000" level—i.e., it is assumed that the students who take it have decided that the course content is important for their lives and career, and not merely a class that they have to take to fulfill a requirement for graduation. It covers a lot of information that will be valuable to you if you get a job that deals with molecular cell biology or pursue additional post-graduate research or clinical training, and we hope you will someday let us know if you agree or disagree with this assessment (so far, the cards and e-mails we've gotten from former students have agreed!).

Students sometimes earn a lower grade than they think they should because they take this course before they are prepared, or with a too-heavy load of other courses, or due to other complications. We hope this will not be the case for you, and we have provided suggestions (below) that might help you study for the exams. However, if you do poorly, remember that learning how to deal with adversity is one of the keys to success in life. You might be surprised by how often successful scientists and engineers can recount instances where they performed poorly in a course the first time they took it and this led them to retake the same or related material to make up for this weakness, resulting in their becoming strongest on that subject. Although it is unusual to take a course twice, a few students have done so for BIOL3450 and found it to be worthwhile.

Suggestions for studying: Here are suggestions from three sources about how best to learn the material in this course.

I. General principles/approaches:

a) Take notes by hand. Rewrite your notes, preferably no later than the evening of the class day. Do not just recopy your notes, but rather both condense and extend them where appropriate, paraphrasing them so that you make the meaning your own.

b) Develop relationships with other class members and form study groups if you can, so you can convert the information from a passive mode into an active mode, as you discuss it with others.

c) Work "what if" scenarios and practice problems: study the text and lecture information, then ask yourself (and/or study team members) questions about it to ensure you really know it. If there are mathematical relationships, think of practice problems using them.

d) Enter the tester's mind by asking yourself (or team members) what are the most important things in each section, keeping in mind both that you need to know the concepts involved and the appropriate vocabulary to describe the process. You can take the exams from previous semesters to see if your level of questioning is similar to the instructors, but do not study the exams because most of the questions are made fresh every semester.

e) Set attainable study/learning goals so the time you allocate to studying this course is used most effectively. For examples: If you learn best from the notes with supplementation from the textbook, do not read the textbook first and end up using all your study time getting halfway through the chapter and having none left to review the notes. If you start your review by recopying the diagrams in the notes from memory, do not get bogged down in trying to exactly recapitulate the artwork when a simpler sketch will describe the main ideas adequately.

II. Learning suggestions from Dr. Merrill: As you study the material, ask yourself:

1) What fundamental cell biology question is this addressing? For example: How do proteins get from their site(s) of synthesis to their ultimate destination(s) in cells?

2) Then, imagine that you have been asked this question by someone you know, and you are answering it for them….

3) …and they keep asking you for clarification--"Okay, but how does that work?" "How does the cell turn that on and off?" "What happens after that?" " What use is that?"

4) Repeat this exercise until you think you have been able to explain how the process works using the appropriate terms that apply to the steps you have had to explain. You will retain this vocabulary of new terms and concepts longer than if you try to memorize them as items on a page.

III. Comments/suggestions from previous students who have done very well on the exams:

>I have learned … to focus heavily on the lecture slides, and to completely understand every word and mechanism discussed in these slides. As I go through the lecture slides, I look at the corresponding book material, focusing only on the picture captions for diagrams discussed in class and the text descriptions of the complex mechanisms. Thus, I refer to the book more as a secondary reference to clear up material that I find confusing from lecture. I find the section summaries in the textbook to be very helpful for understanding big concepts as well. I also look through all the old practice exams and make sure to not only understand what the correct answer is and why, but also why the other answer choices are wrong. I have found these methods of studying to help me on past exams, and I hope they can be of some assistance to other students.

>I hear people say Biology is all about memorization, but I completely disagree. In fact, I can't memorize anything I don't understand. I believe they should do the same, i.e. understand all the concepts before resorting to memory.

>It's always helpful for me to read the book, before or after class. It helps keep what you're learning on track and in a way put it all in better context. [this is only true, however, if you can read fast enough to keep up with the class; otherwise, it can make you get behind]

>A studying technique that's been VITAL for me: Here's how I studied for the last test. I went to the Molecular Science and Engr. Bldg, picked an empty classroom and started lecturing!! Granted I sounded crazy for being alone in there and talking to myself for hours, but it was an extremely beneficial experience for me. (1) It prevented me from getting bored as opposed to when sitting and studying on some desk. (2) It allowed me to

realize how much I do or don't know about a concept and act accordingly. (3) If you really convince yourself that you're in a real classroom, it would allow you to think like a teacher, elaborate on concepts, and be better prepared for the test.

>To do well … in Cell Bio in general, after studying I'd take the old tests posted on T-square and make sure I know how to answer the questions, not remember the answers.

>My advice to other students would be to look over the parts of the book that were covered in the powerpoints, especially if they don't understand the pictures/figures. I also tend to jot down a few notes when reading over sections of the book just to make sure that I understand the concept.

>The method that I have found most helpful when studying … has been to teach the material to another person, while using the slides and my notes as prompts. Obviously, it's best to have studied some before doing this, so that it's not just reading off the slides. I find this to be more interesting than staring at the pages for hours and involving another person adds motivation and focus, since it is embarrassing to fumble with the information in front of someone else. Additionally, being asked questions by a motivated listener really helps me pick out which areas I need to work on. For me, this is the best method, particularly because I am interested in becoming a professor, but it can be time consuming. Generally, I would recommend small study groups, since it is easier to ask questions and be involved. Removing the answers from the old exams before looking at them and waiting until after studying to attempt the old exams are also helpful because it is easier to identify what has been effectively learned and which topics need to be reviewed.

These suggestions are provided as "food for thought" and we hope you have, or are successful in developing, method(s) that work well for you. Feel free to discuss this with the instructors if you are having difficulty learning the material and doing well on the exams.

Stress management: We find that some students have difficulty with stress while taking this course, with a lot of factors coming into play: it covers a lot of material; the students who take it come from a variety of backgrounds; many of the students have a heavy load of other courses and outside activities that compete for their time; and—being a 3000-level course--the format is more "open-ended" than most (or all) of the courses that the students have taken previously. By "open-ended" we mean that the goal of the course is not just to survey the major concepts and processes in cells at a molecular and cellular levels, but also to prepare students for future developments in the field by discussing recent research publications and broader implications of the subject.

The first way to control stress about the course is to keep up-to-date with the course material, being careful to prioritize your time in dealing with it. Most students find the class ppt and notes to be the best place to start, then use the textbook to further explain topics that you do not understand from the notes, as well as to read about topics that were not covered but interest you. If, however, you are the type of student that learns best from the textbook, feel free to use your preferred method to learn the material, but notice which topics are emphasized by the instructors (by what they covered in class--you do not need to learn everything in the textbook, so do not let it scare you). We think you will find it useful to study with others; however, this doesn't work for everyone, and you can be just as successful at learning the material by teaching it to an "imaginary friend" as long as she/he is able to ask questions about it to ensure you know what you are talking about! See the section above about study methods, if you think it might also help.

The Counseling Center is committed to helping Georgia Tech students manage their stress so that they can succeed. They have a variety of brochures and programs devoted to this important skill of stress management. You can get them by going by the counseling center to pick up a brochure or you can download it from their web site, which also has videos on stress and strategies for dealing with stress: http://www.counseling.gatech.edu/plugins/content/index.php?id=32

Some students also benefit from assistance from the Georgia Tech ADAPTS office, and if you think they can be helpful, we encourage you to contact them (http://www.adapts.gatech.edu).

Sometimes students have difficulty taking an exam when uncomfortably crowded between other students, so if that happens to you, feel free to move to another seat in the room (there are usually several at the front), and we've occasionally had students take the exam in the hallway.

THE HONOR CODE AT GEORGIA TECH: All students are required to adhere to the Georgia Tech Academic Honor Code (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 phases, 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.

In science, it is assumed that most of what you write or say has come from another source, even if you are assembling the information into a hypothesis or conclusion that is uniquely your own. Therefore, you are expected to acknowledge those sources. 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 an 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.

Cell & Molecular Biology, BIOL 3450 SYLLABUS Spring 2015

Class #	DAY	DATE	Chap	LECTURE TOPIC	Lecturer
1	MON	5-Jan	1 & 9	Introduction to cells and cell biology literature	AM
2	WED	7-Jan	2	Chemical Foundations	AM
3	FRI	9-Jan	2,3	Chemical Foundations & Protein Structure and Function	AM
4	MON	12-Jan	3	Protein Structure and Function	AM
5	WED	14-Jan	4	Basic Molecular Genetic Mechanisms	AM
6	FRI	16-Jan	5	Molecular Genetic Techniques	AM
	MON	19-Jan		OFFICIAL SCHOOL HOLIDAY	
7	WED	21-Jan	5	Molecular Genetic Techniques	AM
8	FRI	23-Jan	6	Genes, Genomics and Chromosomes	AM
9	MON	26-Jan	7	Transcriptional Control of Gene Expression	AM
10	WED	28-Jan		EXAM 1 (Chap. 1-6, 9)	AM
11	FRI	30-Jan	7	Transcriptional Control of Gene Expression	
12	MON	2-Feb	8	Post-transcriptional Gene Control	AM
13	WED	4-Feb	10	Biomembranes	AM
14	FRI	6-Feb	11	Transport of ions & small molecules	AM
15	MON	9-Feb	12	Cell energetics	AM
16	WED	11-Feb	13	Moving Proteins into Membranes and Organelles	AM
17	FRI	13-Feb	13,14	Vesicular Traffic, Secretion, and Endocytosis	AM
18	MON	16-Feb	14	Vesicular Traffic, Secretion, and Endocytosis	AM
19	WED	18-Feb	15	Signaling I	AM
20	FRI	20-Feb		EXAM 2 (Chap. 7,8,10-14)	AM
21	MON	23-Feb	15, 16	Signaling I and II	AM
22	WED	25-Feb	16	Signaling II	AM
23	FRI	27-Feb	17	Microfilaments	AM
		28-Feb		Last day to drop individual courses(s) with a grade of "W"	
24	MON	2-Mar	17,18	Microfilaments, Microtubules & IF	AM
25	WED	4-Mar	18	Microtubules & IF	AM
26	FRI	6-Mar		FIRST RESEARCH PAPER DISCUSSION	AM
27	MON	9-Mar	20	Integrating Cells into Tissues	AM
28	WED	11-Mar	20	Integrating Cells into Tissues	AM
29	FRI	13-Mar		EXAM 3 (Chap. 15-18, 20 & Research Paper)	AM
		16-20-Mar		SPRING BREAK	
30	MON	23-Mar	19	Eukaryotic Cell Cycle	SN
31	WED	25-Mar	19	Eukaryotic Cell Cycle	SN
	FRI	27-Mar		SECOND PAPER DISCUSSION	SN
32	MON	30-Mar	21	Stem Cells, Cell Asymmetry & Cell Death	SN
33	WED	1-Apr	21	Stem Cells, Cell Asymmetry & Cell Death	SN
34	FRI	3-Apr	21	Stem Cells, Cell Asymmetry & Cell Death	SN
35	MON	6-Apr		THIRD PAPER DISCUSSION	SN
36	WED	8-Apr	22	Nerve Cells	SN
37	FRI	10-Apr	22	Nerve Cells	SN
38	MON	13-Apr		EXAM 4 (Chap. 19, 21-23 & Papers 2,3)	SN
39	WED	15-Apr	23	Immune cells	SN
40	FRI	17-Apr	23	Immune cells	SN
41	MON	20-Apr	24	Cancer	AM
42	WED	22-Apr	24	Cancer	AM
43	FRI	24-Apr		Course Wrap-up	AM/SN
	MON	27-Apr		FINAL EXAM (11:30am - 2:20pm)	
				Chap. 24 and the entire semester	