LIFE 210
Introductory Eukaryotic Cell Biology
Lecture Schedule for Fall Semester 2013

Lecture: 001: Clark A201, 12:00-12:50 PM MWF

Honors Recitation: R90: MRB 123, 11:00-11:50 AM R

Instructor (1st half): Chaoping Chen, Office 233 MRB, Phone: 491-0726
Office Hours: By appointment (phone, email or see me after class to schedule)
Email: Chaoping.Chen@ColoState.edu

Instructor (2nd half): Santiago Di Pietro, Office 281 MRB, Phone: 491-5302
Office Hours: By appointment (phone, email or see me after class to schedule)
Email: Santiago.DiPietro@ColoState.edu

Teaching Assistant: Jenifer Shattuck, Phone: 491-6486
Office Hours: By appointment (email or see her in class to schedule)
Email: jeshat@lamar.colostate.edu

(4th edition 2002 or Essential Cell Biology, 3rd edition by Alberts et al. 2009 will also work)

Course Objectives

- First, a student completing LIFE 210 with a C grade or better will be able to think critically and apply cell biology concepts and knowledge. Cell biology is the molecular and chemical underpinnings of how and why life (cells and organisms) works. Until we invent cameras to record the processes first hand, understanding cell biology means interpreting data providing the indirect evidence for how things work.
- Second, students will learn core concepts and definitions in cell biology. Understanding and critical thinking are most important and lasting, but knowing a certain amount of content knowledge and learning the cell biology “language” is required for hanging that understanding on.
- Third, students will gain an “appreciation” for the field of cell biology. I hope you come away from this class thinking that cell biology is cool and excited to learn more and in greater depth. This course will only give you the tip of the iceberg, will provide a springboard for delving into your future areas of interest in greater depth.

Course Materials

To help you grasp the organization of the course content, what concepts we want you to know and understand and to study on your own outside of class, we will provide the following materials:

- 8 Unit outlines
- Lecture slides
- Unit study guides
- Example exams

Quizzes and Exams

1. 10 Quizzes – 50 points total
   The quizzes will be administered on RamCT blackboard. They will be posted every Friday (see course schedule below), except the Fridays of the four exams and will be due on the following Monday before class time (noon). There will be 10 quizzes and you will be given two attempts on each.
2. Exams – 500 points total
   There will be five exams worth 100 points apiece. The exams will be administered in class. They will consist of 26 multiple choice and four free response questions (chosen out of five provided). The exams will only cover what we talk about in class and emphasize in the study guides and quizzes.

How to Study

Come to class prepared (know something about what we will talk about) having read the textbook pages and...
looked over the lecture outlines and the study guide questions for the lecture. Review lecture notes and the study guide questions and attempt to answer these questions. If you do not have a good understanding of the questions and how to answer them ask about them at the beginning of the next class, make an appointment to go over them individually. Use the quizzes and study guides as practice for the exams. Study your notes including key terms and concepts, and then take the quiz the first time without your notes. If you do not do as well as you would like, review your notes again and take the quiz a second time with your notes and book open. Use a similar approach with the example exams. Finally, I strongly suggest that you practice diagramming the biochemical processes on a white board multiple times rather than just looking over them in order to study them. You will find the information sticks in your memory much more quickly and you will recognize gaps in your understanding more readily. Using this approach in a study group is even more effective. Free tutoring is available in the the Arts and Sciences Tutorial Hall from 5 to 10 p.m., Sunday through Thursday. It is located in the George Russell Great Hall on the 2nd floor of the TILT Building. For more details see http://tilt.colostate.edu/learning/tutorialPrograms/artSciences.cfm.

### Syllabus

<table>
<thead>
<tr>
<th>Date</th>
<th>Period</th>
<th>Topic</th>
<th>Text Reading 5th ed.</th>
</tr>
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<tbody>
<tr>
<td>Aug. 26</td>
<td>CC1</td>
<td>Introduction/overview of course: key concepts and big ideas</td>
<td>pp. 8-10; 12-14; 35-42</td>
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#### Unit 1: Macromolecular Structure and Function - Overview

<table>
<thead>
<tr>
<th>Date</th>
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<tbody>
<tr>
<td>Aug 28</td>
<td>CC2</td>
<td>Anticancer drugs</td>
<td>pp. 1205-1213; 1224-1225; 1229-1230; 1256-1262</td>
</tr>
<tr>
<td>Aug 30</td>
<td>CC3</td>
<td>Anticancer drugs</td>
<td>1256-1262</td>
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<tr>
<td>Sep 2</td>
<td></td>
<td>Labor Day- NO Class</td>
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<tr>
<td>Sep 6</td>
<td>CC5</td>
<td>Cellular composition:</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Four classes of macromolecules</td>
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#### Quiz 1 due noon Tuesday September 3

#### Quiz 2 due noon Monday September 9

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<tr>
<th>Date</th>
<th>Period</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Sep 9</td>
<td>CC6</td>
<td>Cellular composition:</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Formation into cellular structures</td>
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<tr>
<td>Sep 11</td>
<td>CC7</td>
<td>Cellular composition:</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Formation into cellular structures</td>
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#### Unit 2: Macromolecular Structure and Function - Proteins

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<tr>
<th>Date</th>
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<tbody>
<tr>
<td>Sep 13</td>
<td>CC8</td>
<td>Proteins: structure and functions</td>
<td>pp. 1215-127; panel 3-1 pp. 128-129; 130-131; 134-135; 142-146; 148-151</td>
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#### Quiz 3 due noon Monday September 16

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<tr>
<th>Date</th>
<th>Period</th>
<th>Topic</th>
<th>Text Reading 5th ed.</th>
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<tbody>
<tr>
<td>Sep 16</td>
<td>CC9</td>
<td>Proteins: structure and functions</td>
<td></td>
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<tr>
<td>Sep 18</td>
<td>CC10</td>
<td>Proteins as catalysts</td>
<td>pp. 72-77; 158-161; 164-166</td>
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<tr>
<td>Sep 19</td>
<td></td>
<td>Review for Exam 1</td>
<td></td>
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<tr>
<td>Sep 20</td>
<td>E1</td>
<td>EXAM 1 (covering lectures CC1-9)</td>
<td></td>
</tr>
<tr>
<td>Sep 23</td>
<td>CC11</td>
<td>Proteins as catalysts</td>
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#### Unit 3: Macromolecular Structure and Function – Lipids and Membranes

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<th>Date</th>
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<th>Topic</th>
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<tbody>
<tr>
<td>Sep 25</td>
<td>CC12</td>
<td>Transmembrane transport in cancer</td>
<td>pp. 663; 665-666</td>
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<tr>
<td>Sep 27</td>
<td>CC13</td>
<td>Membrane composition and assembly</td>
<td>pp. 617-625; 626-629</td>
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#### Quiz 4 due noon Monday September 30

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<th>Topic</th>
<th>Text Reading 5th ed.</th>
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<tbody>
<tr>
<td>Sep 30</td>
<td>CC14</td>
<td>Membrane composition and assembly</td>
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<tr>
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<th>Topic</th>
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<tbody>
<tr>
<td>Oct 2</td>
<td>CC15</td>
<td>Solute diffusion and transport across membranes</td>
<td>pp. 651-652; 631-635; 652-654; 654-659</td>
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Oct 4  CC16  Solute diffusion and transport across membranes  pp. 658-660; 661-663; 665-666

**Quiz 5 due noon Monday October 7**

Oct 7  CC17  Solute diffusion and transport across membranes

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**Unit 4: Metabolism – Flow of Matter and Energy in Cells**

Oct 9  CC18  Metabolic changes in cancer cells  pp. 1206 Figure 20-1

Oct 10  Review for Exam 2

Oct 11  E2  EXAM 2 (covering lectures CC10-17)

Oct 14  CC19  Overview of cellular metabolism  pp. 65-72; 77-83; 88-93; 96-100; 101-103

Oct 16  CC20  Overview of cellular metabolism

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**Unit 5: Intracellular Compartments, Protein and Lipid Sorting**

Oct 18  SDP21  Compartmentalization of cells  Ch. 1 & 12, pp. 26-30; 695-704

**Quiz 6 due noon Monday October 21**

Oct 20  SDP22  Protein sorting to cellular compartments I  Ch. 12, pp. 704-712; 713-720

Oct 23  SDP23  Protein sorting to cellular compartments II  Ch. 12, pp. 723-745

Oct 25  SDP24  Protein sorting to cellular compartments III  Ch. 13, pp. 749-779

**Quiz 7 due noon Monday October 28**

Oct 28  SDP25  Lipid and protein sorting IV  Ch. 13, pp. 779-809

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**Unit 6: Cellular Communication**

Oct 30  SDP26  Principles of cell signaling  Ch. 15, pp. 879-904

Oct 31  Review for Exam 3

Nov 1  E3  EXAM 3 (covering lectures CC18-20 & SDP21-25)

Nov 4  SDP27  Membrane receptors/G-proteins  Ch. 15, pp. 904-921

Nov 6  SDP28  Enzyme-linked receptors  Ch. 15, pp. 921-945

Nov 8  SDP29  Signaling through proteolysis  Ch. 15, pp. 946-955

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**Unit 7: Cell Shape and Movement**

**Quiz 8 due noon Monday November 11**

Nov 11  SDP30  Molecular dynamics of the cytoskeleton  Ch. 16, pp. 965-991

Nov 13  SDP31  Regulation of cytoskeletal dynamics I  Ch. 16, pp. 992-997

Nov 15  SDP32  Regulation of cytoskeletal dynamics II  Ch. 16, pp. 997-1010

**Quiz 9 due noon Monday November 18**

Nov 18  SDP33  Motor proteins  Ch. 3 & 16, pp. 179-182; 1010-1025

Nov 20  SDP34  Cytoskeleton and cellular behavior  Ch. 16, pp. 1025-1050

Nov 21  Review for Exam 4

Nov 22  E4  EXAM 4 (covering lectures SDP26-32)

Nov 25-29  Fall Recess/Thanksgiving Break – No Classes

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**Unit 8: Cellular Growth Control**

Dec 2  SDP35  Cell cycle I: An overview  Ch. 17, pp. 1053-1060

Dec 4  SDP36  Cell cycle II: Regulation  Ch. 17, pp. 1060-1112

Dec 6  SDP37  Programmed cell death  Ch. 18, pp. 1115-1128

**Quiz 10 due noon Monday December 9**

Dec 9  SDP38  Cellular senescence  Ch. 5 & 8, pp. 292-294; 505

Dec 11  SDP39  Cell biology of cancer I  Ch. 20, pp. 1205-1240

Dec 13  SDP40  Cell biology of cancer II  Ch. 20, pp. 1241-1265

Dec 19  E5  EXAM 5 (covering lectures SDP33-40) Thursday 4:10 to 6:10 PM
**Last add/drop and W-drop days**

Wednesday September 11 – last add/drop day; will have taken 2 quizzes by then.
Monday October 21 – last course withdrawal day (take W grade); will have taken 6 quizzes and 2 exams by then.

**iClickers**

You will want to purchase an iClicker remote for in-class participation. iClicker is a response system that allows you to respond to questions we pose during class; you will receive extra credit points for that feedback and/or participation. In order to receive this credit, you will need to register your iClicker remote by the first Friday of the semester (August 30, 2013).

For Web Registration:
To register your iClicker, go to [https://wsnet.colostate.edu/cwis262/clicker/registration.aspx](https://wsnet.colostate.edu/cwis262/clicker/registration.aspx) (NOT iClicker.com). Login with your eIdentity eName and password. In the iClicker ID field, enter your remote ID number and select the "Register" button. The remote ID is the number found on the back of your iClicker remote. iClickers will be used every day in class, and you are responsible for bringing your remote daily.

**Grading**

There are a total of 500 points for Exams and 50 points for Quizzes. Each of the 5 exams in LIFE 210 will be worth 100 points (500 total). The 10 weekly quizzes, on RamCT under Assessments are worth 10 points each, but will be weighted to be worth a maximum total of 50 points for determining the final combined score (total score out of 550 points possible). If you achieve the following point totals for LIFE 210 you will be assured of the minimum letter grade shown:

1. 495-550 (≥90%)  A
2. 440-494 (80-90%)  B
3. 385-439 (70-80%)  C
4. 330-384 (60-70%)  D
5. <330  (<60%)  F

Each exam or quiz will not be curved individually, but the final total points required for a course grade might be curved depending on the averages and distribution of points. In addition, your grade for LIFE 210 will be determined based on the total 550 points (combined). Students in LIFE 210 have averaged around 80% of the total points possible over the past several years. As a result, there is usually no grading curve.

In-class iClicker questions will be worth 1 point for answering and an additional 0.5 points for answering correctly. These points will be weighted to be worth a maximum total of 20 extra credit points (in addition to the 550 total possible points) at the end of the semester.

**Make-up Exams and Exam Regrading**

There will be no make-up exams offered. Unexcused absences from an exam or quiz will be graded as zero. If you have an excused absence (based on written or other verifiable evidence) from an exam or quiz, your final grade will be based on a percentage of the total possible points for the exams and quizzes you did take. Alternatively, students can schedule to take an exam early with the instructor if they know they cannot take the exam at the regularly scheduled date and time. If you have questions concerning the grading of any of your exams or quizzes, the questions you want re-graded should be circled and the exam or quiz should be turned in to the instructor within one week of the date of its return to the class after grading. You must also provide a written explanation as to why you feel the question should be re-graded. Exams will not be accepted for re-grading after this one-week period, so go over your exam carefully soon after it has been returned to you.

**CSU Academic Integrity Policy and LIFE 210**

By registering for this class you enter into a contract between each student (you) and the instructors (us) constituting an agreement on our respective roles in gaining the knowledge and understanding of cell biology and earning the grade that you desire. As the instructors, our role is to organize and present the material and stimulate, facilitate and guide you through learning and understanding the core concepts in eukaryotic cell biology. As the student, your role is to attend class, not to talk during class unless you are asked to or are asking the instructor a question and to participate in class discussions and in answering iClicker questions. If you wish to do well in this course (earn an A or B), we strongly suggest that you attend every class and listen
(not text or surf the Internet or watch movies, etc.), use the study guides (answer the questions to the best of your ability on your own, then check your answers against the answers we post), form study groups, attend review sessions, schedule office hours with the instructors and/or the GTA to clarify concepts, and study by practicing rather than merely looking over your notes (please ask us if you do not know what this means).

More specifically, in LIFE 210 the students and the instructors will abide by the Academic Integrity Policy of CSU as defined in the General Catalog (see section 1.6, page 7 http://www.catalog.colostate.edu/) and the Student Conduct Code (see Article III: Proscribed Conduct on page 4 http://www.conflictresolution.colostate.edu/conduct-code). While taking an exam, the use of class notes, study guide answers, copies of old exam answers, cheat sheets or the assistance of others by looking at their exam or communicating verbally or by text, email, etc. is not allowed. We will not provide copies of old exams with answers as this encourages cramming from them rather keeping up with and working to gain a true understanding of the key cell biology concepts. We cannot prevent you from obtaining copies of old exams and answer keys, but cramming from them will significantly reduce the proportion of the concepts and information from this class that you retain. This retention is important for you to do well in the courses that use LIFE 210 as a prerequisite and ultimately in your performance on the MCAT or GRE, in graduate school, professional school and your career. Working in groups on the tutorials, quizzes and study guide questions is encouraged (we could not police this anyway and the study guides are not scored). We do suggest that you attempt to complete the quizzes and study guide questions individually first to get the maximum benefit for preparing for the exams. For answering the iClicker questions during class discussing the possible answers will be strongly encouraged (after attempting to answer them on your own the first time). However, answering these questions for other students that did not decide to attend class (using multiple iClickers) is not allowed.

Maintaining academic integrity is important in LIFE 210 not just to get the most out of the class, but also because having and conducting yourself with integrity is core to everyone’s self-worth and societal worth. If you let the small stuff slide, the next step is justification of doing a poor job, then plagiarism, then cheating on exams, your homework assignments, your taxes, etc. Even if you are not caught, conducting yourself without integrity eats at your self-esteem. To learn more visit the Practicing Academic Integrity on the Learning@CSU Website (http://learning.colostate.edu/integrity/index.cfm).