Biology 302 Course Syllabus  
Cell and Molecular Biology  
Fall 2019

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Course Description: The primary emphasis of this course will be the basic structure and function of the cell. We begin the semester by looking at the “smaller picture” – the basic types of organic molecules that contribute to cells. We then explore cellular processes by starting on the cell surface and working our way into the interior of the cell. General topics include membrane transport and signaling, gene expression, intracellular transport, structure and motility, energy conversions, and cell division. Laboratory exercises will reinforce many of concepts covered in lecture. This course assumes the student has learned and retained a basic understanding of the fundamental cellular concepts presented in Foundations I and II.

Course Structure:

Lecture: T, R 9:20-10:50  
Hoyt 258  
Laboratory: R 2:00PM – 5:00PM  
Hoyt 343

Office Hours: M,W 1PM- 2:30PM Hoyt 222  
OR other times by appointment  
Simply email, call or ask me for a time that will work for you. The sole purpose of making an appointment is that I want to be sure that I will be in my office at the time you want to meet with me and you know which office to find me in at that time.

Required:

Molecular Biology of the Cell.  

2. Composition-style, quad-lined laboratory notebook.

3. Frequent visits to the Bio 302 course page on D2L for:  
   - Laboratory Handouts  
   - Primary research articles  
   - Online quizzes  
   - Detailed reading lists  
   - Electronic Resources
**Course Objectives:** This course is intended for those students majoring in biology, molecular biology, biochemistry, or neuroscience. It is designed for students interested in the field(s) of basic research, medicine, secondary education and/or scientific literature. Specifically the goals of this course are to:

1. Develop skills and a mind-set for self-motivation and self-learning;
2. To enhance student comprehension and appreciation of the cell: its intricacy and beauty, its diversity, and its functions.
3. Develop qualitative and quantitative reasoning skills required for scientific inquiry, experimental design, and problem solving.
4. Introduce a familiarity with some of the basic molecular and biochemical techniques used for the study of cell and molecular biology.
5. Strengthen various presentation, laboratory and research skills such as scientific notation, scientific writing, oral presentation and literature research and comprehension.
6. To encourage students to place the “facts” of cellular and molecular biology into an operational and theoretical framework

**Graded Assignments:**
Note that graded assignments that are received late will be handled as follows: 5% reduction in possible points will be applied for each day the assignment is late. Any assignment that is more than 1 week late will not be accepted, thus no points will be earned. Please contact me immediately if extenuating circumstances may cause you to be late turning in an assignment.

**Exams:** There will be five 100-point exams throughout the semester. Exam questions will include a range of question types such as multiple choice, short answer or matching questions to access basic concepts, and essay questions covering either theories or complex pathways, together with data interpretation questions to assess both conceptual knowledge and critical thinking skills. The first four exams will cover the most recently covered chapters. The final exam will be cumulative covering the material from the first four exams.

**Primary Literature:** The material covered from the textbook in this course will be supplemented by reading several research articles. You will be expected to read these papers outside of class time and come prepared to class ready to discuss and interpret the papers. You will be involved in the use of these articles in class at several levels:

*Comprehension Worksheets:* These activities are intended to assess if you read the paper in advance and your level of comprehension, as well as to develop your ability to interpret primary literature. As the semester progresses you may perform these activities individually or in groups.

*Oral Presentations:* This assignment is intended to improve your oral communication skills and enhance your ability to explain science to other scientists. We will spend time in class in advance of your presentations discussing the steps involved in both effectively reading and presenting a research paper. Detailed instructions on the presentation itself will be supplied in a supplementary handout.

**Secondary Research Article:** Over the course of the semester you will be working in stages on a 6-8 page research paper on a specific protein involved in cell and molecular biology, written in the style of a secondary or “review” article. This assignment will have multiple parts, which will be described in more detail in a supplementary handout.
Laboratory: Your participation in laboratory exercises will be graded in several ways:

Lab quizzes: These quizzes are intended to ascertain your knowledge and understanding of the techniques you are performing in the laboratory. They may occur online in advance of lab or during the laboratory period during one of the incubations that occurs in most of the protocols we will perform. Make sure you check the syllabus to determine if you are required to perform a quiz in advance or if it will occur in class. Online quizzes are due at the start of lab and will not be re-opened.

Lab worksheets: Some labs will not be written up in the lab notebook and rather will be graded based on the completion of a worksheet, worksheets will either be provided in lab or posted online.

Lab notebooks: It is expected that you keep an up to date laboratory notebook, adding new information as soon as it is collected. A separate document containing the specific guidelines for the contents of your lab notebook will be provided. In order to ensure you keep your notebook up to date they will be collected at the end of most laboratory sessions to be checked for completeness (see schedule for dates), and returned the following class period. Point values for lab notebooks will be as follows:

<table>
<thead>
<tr>
<th>Lab Name</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solutions and Dilutions</td>
<td>5</td>
</tr>
<tr>
<td>Cell Culture</td>
<td>5</td>
</tr>
<tr>
<td>IB 1 2 and 3</td>
<td>15</td>
</tr>
<tr>
<td>Cell Cycle</td>
<td>5</td>
</tr>
<tr>
<td>IF 1 and 2</td>
<td>10</td>
</tr>
<tr>
<td>Notebook Formatting</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>45</strong></td>
</tr>
</tbody>
</table>

Laboratory summaries: At the conclusion of a series of experiments your laboratory group will turn in a single project that includes summation of methods, presentation of results and answering questions related to both the methods and outcomes of the experiments, meant to mimic the development of a primary research article. Due dates are indicated on the course schedule.

Course Grading:
Exams (5; 100 pts each)          500 points
Oral Presentation/Review        50 points
Written Assignment: Secondary Research Paper 150 points
Lab/Literature Worksheets (multiple for various points) 120 points
Literature Quizzes (2; 10 pts each) 20 points
Lab Quizzes (8; 5 pts each)      40 points
Lab Notebooks (collected various times) 45 points
Lab Summaries (2; 25 or 50 points) 75 points

1000 TOTAL

NOTE: Points total is subject change, especially if numbers of laboratory quizzes or paper worksheets are adjusted. Your grade in the course is a straight percentage; the number of points you have earned divided by the total possible points. I will try to keep these up to date on D2L but you can easily keep track of your own grade.

A...... 93% or greater C...... 73% - 76.95%
A-...... 90% - 92.95%  C-...... 70% - 72.95%
B+...... 87% - 89.95%  D+...... 67% - 69.95%
B...... 83% - 86.95%  D...... 63% - 66.95%
B-...... 80% - 82.95%  D-..... 60% - 62.95%
C+..... 77% - 79.95%  F...... below 60%
**Attendance:** Attendance at labs and exams is mandatory. Please identify any conflicts between these and college sponsored activities or events and report them to me at least one week *in advance* of the activity so that a make-up exercise can be arranged. The only excused absences for exams or labs are the ones stated in the Westminster catalog (college-sponsored activities; personal medical emergencies, etc.). Students must make contact with the instructor within 48 hours of an exam or laboratory missed due to an emergency in order to arrange an alternative assignment.

While attendance to lectures is not mandatory, there is a strong correlation between attendance and final grade. Your exams are 50% of your final grade, and it is your responsibility to make sure you understand the material. If you miss a lecture, you must find out what you missed and make sure you understand the content. **If you need help at any time, with any of the material – please ask.**

**Academic integrity:** The issue of academic integrity is taken very seriously at Westminster. Students are expected to abide by the College Policy on Academic Integrity. The policy can be found at:

http://www.westminster.edu/acad/pdf/undergraduate_catalog.pdf

Academic integrity is particularly important when dealing with scientific writing. Written assignments must be the student’s own work. Quotes, data or ideas taken from another source must cite that source fully and correctly. I will be using turnitin.com to determine that your work is in fact your own. If you don’t understand how to do this, please ask. **Work that is not the students own, i.e. copied from an external source, a classmate or class material is considered plagiarized, and will receive a score of zero. In addition, a written report will be sent to your academic advisor, and to the Dean.** Note: plagiarism includes extensive, unnecessary quoting from another source, even if it is cited. More than one incident of plagiarism may result in failure of the course. If in doubt – ask.

**Electronic Devices**

Please refrain from using any device in class that might disrupt the lecture or your colleagues. This includes, but is not limited to: cell phones, pagers, PDA, iPods (I know this list is a little dated but you get the idea). Laptops and tablets are allowed but strictly for note taking only.

**Tentative** schedule for Fall 2019 term and specific pages for textbook readings in each chapter are posted on D2L