BIO. 323/523 MOLECULAR AND CELL BIOLOGY
THE ONLINE VERSION

INSTRUCTOR: **Dr. Beatrice (or Bea) Holton**
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OFFICE HOURS: I will check my e-mail and the D2L website *at least* once in the morning and once in the afternoon every weekday. If you would like to visit me at UWO or call me on the telephone, please make an appointment by e-mail. In the past, I have set up regular face-to-face appointments with students who prefer that type of interaction.

COURSE CREDITS: 3 (online, only; no laboratory or face-to-face component; NOTE: exams must be proctored)

TEXT: Alberts, Bray, Hopkin, Johnson, Lewis, Raff, Roberts,Walter (2010) **Essential Cell Biology**, 4th edition, Garland Science, Taylor and Francis Group, New York & London.

PODCASTS AND POWERPOINT SLIDES: Podcasts and annotated PowerPoint slides have been uploaded to Content in D2L. Use these resources, in addition to the book. Use what fits your learning style best. A complete schedule for watching the podcasts is posted on the Announcement board and under Content with PowerPoints. STAY WITH THE PROGRAM; DON'T FALL BEHIND!

LEARNING OUTCOMES: 1) Students should learn concepts that are the foundation for cell biology, physiology, medicine, evolutionary biology and aspects of ecology; 2) Students will improve their ability to write clearly, logically and appropriately for a science-oriented audience; 3) students will improve their critical thinking skills by analyzing figures, graphs and tables and applying the academic principles learned to the interpretation of these data.

Week	Topic and Major Exams/Assignments	Chapter
1 (June 16)	Protein structure and function; Membrane structure	4, 11
2	Membrane structure (cont.); Membrane transport	11, 12
3	Cell communication; **1st Exam on Thurs.! July 3 (Ch. 4, 11, 12, 16)** **Provide data for 1st paper.**	16
4	Intracellular compartments and protein transport; cytoskeleton **Submit 1st draft of paper Wed.**	15, 17
5	Cytoskeleton; Energetics **Submit final draft of first paper Wed.**	17, 14
6	Structure of DNA and chromosomes; DNA replication. **2nd Exam on Tues. July 22 (Ch. 15, 17, 14) Provide data for 2nd paper Tues. 1st draft due Friday.**	5, 6
7	Transcription and translation. **Final draft 2nd paper due Friday Aug. 1.**	7, 8
8	Control of gene expression. **3rd Exam on Tuesday Aug. 5 (Ch. 5, 6, 7, 8)** **Final Exam on Friday Aug. 8 (All chapters)**	8

GRADING (Undergraduates): 40% of the grade will be based on the first three, **unit exams**, **20%** on the comprehensive **final exam**, **30%** on two, short, **research-style papers** and **10%** for meaningful participation in discussions and short assignments*. 93-100% = A, 90-92 = A-, 87-89 = B+, 83-86 = B, 80-82 = B-, 77-79 = C+, 73-76 = C, 70-72 = C-, 67-69 = D+, 63-66 = D, 60-62 = D-, below 60% = F. Grades will only be "curved", if necessary. Cheating in any form (including plagiarism, excessive and/or undocumented paraphrasing) will NOT be tolerated. Students caught cheating will receive an F in the course and will be reported to the Dean of Students.

* A couple of times a week I will give you data and ask you to write a short paragraph about the data. This is in preparation for the papers. "Meaningful participation" means that you participate in discussion about those assignments and that you write a paragraph showing effort and understanding. I will be the judge of what is "meaningful".

GRADING (Graduate students): 40% of the grade will be based on the first three, unit exams, 20% on the comprehensive final exam (Exam #4), 30% on two, short, research-style papers and 10% on the project. 94-100% = A, 90-93 = A-, 88-89 = B+, 84-87 = B, 80-83 = B-, 78-79 = C+, 74-77 = C. Note that any grade below a C is considered to be failing for Master's degree students. Grades will only be "curved", if necessary. Cheating in any form (including plagiarism, excessive and/or undocumented paraphrasing) will NOT be tolerated. Students caught cheating will receive an F in the course and will be reported to the Dean of Students.

EXAMS FOR ONLINE STUDENTS: Students who are enrolled in the summer, online version of this course must either come to UW Oshkosh to take the exams OR arrange with a local campus or high school or other entity at which exams may be given. If you choose this latter option, you must arrange this EARLY. The administrator of the exam will have to fill out a registration form and I will have to approve the arrangement. In addition, I will send the exams to that individual.

ADDITIONAL INFORMATION FOR GRADUATE STUDENTS:

Objectives:

1) Special emphasis will be placed on the ability of graduate students to understand and interpret data and to think analytically and critically about information that has been presented in class. To assess accomplishment of this objective, all exams will contain 2-3 additional questions for graduate students. These will be data analysis problems or questions that require critical assessment of new information that is related to topics covered in class.

2) Graduate students will be expected to write more clearly, logically and correctly than undergraduate students. To assess accomplishment of this objective, graduate students will be held to a higher standard for exams and papers. Answers to exam questions should be well-written and they should also incorporate more detail and understanding of the topic than would answers written by undergraduates. Papers should be logical, use vocabulary correctly and show a superior understanding of the topic. Graduate students should be able to build models in the Discussion part of the paper that will be more sophisticated than those developed by undergraduate students.

3) Graduate students will be expected to use the information presented in class to synthesize and develop a new and creative piece of work. To assess accomplishment of this objective, graduate students will complete a project that will bring together different aspects of the course. The type of project will depend upon the student's focus. For example, graduate students who are middle school or high school instructors might choose one topic (from the syllabus, above) and develop a plan for presenting the topic to their middle/high school students. This would likely include giving middle/high school students data from original research papers and getting them to understand how the experiments were done that led to the data, how the data were interpreted and how the experiments finally resulted in the conclusions that are published as "fact" in textbooks. If possible, simple experiments might be designed that the middle/high school students could perform in class to demonstrate aspects of the topic. Graduate students enrolled in traditional biology

graduate programs might research a topic related to their area of research, write a review of the literature in that topic and conclude their review by discussing how the information would affect the design and goals of their research project.

4) Graduate students will be expected to take a leadership role in the course. To assess accomplishment of this objective I will follow their participation in online discussions closely. They should not only participate, but have a superior understanding of the topics so that they can help the undergraduates with tough concepts and assignments. For the first offering of this course, this objective will not be a formal part of the grade, however, assessment of participation will influence the final grade of students who find themselves on the border between one grade and another.

SUGGESTIONS FOR SUCCESS IN THIS CLASS

We cover a lot of material in this course. I suggest that you 1) spend 10-15 hours per week studying the book, studying the PowerPoint slides, listening to the PodCasts, learning processes covered in class, thinking about how different concepts fit together (There are concept maps uploaded to D2L that may help you with this process.), working problems in the book or that I assign and completing steps 2 and 3. 2) On a huge piece of paper, draw an enormous cell and begin to fill in parts as we cover them in class. 3) Practice drawing out (from memory) chemical structures, pathways and processes to make sure that you have learned them…..TEST YOURSELF!

INFORMATION FOR WRITING ASSIGNMENTS:
General Instructions

I will provide you with selected data from the literature that are relevant to theories discussed in class. You are to treat the data as though they were your own and as though you wanted to present the data to others in your field as a publishable research paper. Consequently, you must (1) capture the interest of the reader by developing some background and explaining the significance of the hypothesis tested in your paper; (2), explain clearly the results so that the reader understands their meaning and draws the same conclusions as you as the paper is read, and, (3), discuss how your results expand upon knowledge published to date. Each paper will have:

- **Introduction** that gives some background information but mostly outlines questions in the field (that will be addressed by your data) and the significance of the work presented, i.e. what makes the study important. A rationale statement is often useful.

- **Results** section that explains the data. What do the data show? (To answer this question, you may also have to explain a bit about the techniques used and the rationale for doing specific experiments.) Why were certain controls done?

- **Discussion** section in which a <u>reasonable</u> new hypothesis for future work is formulated from the data.

This sounds like a lot of writing, but, in fact, the maximum page length will be no more than **two** typewritten, double-spaced pages (font no less than 12 point). The key is to think clearly, write concisely and say exactly what you mean…no more, no less.

You may discuss the data (and interpretations of the data) among yourselves. You can also ask me questions, preferably in class where all can profit from the questions and answers.