

BSCI30H: Cell Biology for Life Scientists (4 credits) Biochemical and physiological mechanisms underlying cellular structure and function. Properties of cells, which make life possible, and mechanisms by which cells provide energy, reproduce, regulate and integrate with each other and their environment will be covered. This course is a blended learning course that involves a combination of face-to-face and online interactions. The online component will focus on content while the in class face-to-face portion will focus on application of the content to problems in cell biology.

Course Goals: This course will focus on:

1. Basic units of structure define the function of all cellular and molecular machinery.
2. Biological systems grow and change by processes based upon chemical transformation pathways.
3. How cellular dysfunction can lead to human disease
4. Development of self directed learning and time management skills
5. Development of critical thinking and problem solving skills

Online Portion: You will be expected to spend ~75 minutes each week on the online portion of this class. The online activities for each week must be completed by Tuesday and the online quiz is due by 5:00 PM each Tuesday.

Discussion Board: Each weekly module will include a discussion board to allow you to ask questions about the content in the course. The instructor for that module will monitor the board and answer all questions posted. Students are encouraged to participate in the discussion by posing possible answers and follow-up questions. It is recommended that students check the discussion boards on a regular basis as a supplemental resource to the online and in-class material.

Assignments: Outside of class assignments will be given and due dates with details will be provided for each assignment in class and on ELMS.

Face-to-Face Class Meeting: The in class face-to-face meeting will meet once a week on Thursdays at 9:30 am – 10:45 am and will include short (5-10 minute) lectures and facilitated collaborative data analysis and problem solving. You are expected to review the problems for the in class portion before coming to class to facilitate the class work.

Enrichment Reflections: Each student will be required to attend at least TWO “academic enrichment” seminars. This requirement can be satisfied by attending the ILS Faculty Mentor Seminar Series or by attending any scientific research seminar on research in the life sciences occurring outside of the normal class period. Students are required to write a short paper summarizing each seminar attended.

Office Hours: You can earn 10 **EXTRA CREDIT** points by attending office hours to discuss course content, the instructor’s research, professional development advice etc. If you have class during the office hours you can set up an appointment to meet with the instructor prior to class (9:00-9:30) by emailing the instructor teaching the week you

would like to meet. Another option is to email the instructor you would like to meet with and set up a time to have virtual office hours via Skype.

Prerequisites: Completion of CHEM131, CHEM132, HLSC207, and HLSC322 (with a grade of “C” or better in each case) or equivalent.

Required Textbook: *Molecular Biology of the Cell, 5th Edition*. B. Alberts *et al*, Garland Science, 2008. ISBN: 978-0-8153-4105-5

Course Communications: All course announcements and communications will be through ELMS (<https://myelms.umd.edu/login>). You need to set up your ELMS account to receive updates at least once a day.

Class Meeting: TTH 9:30-10:45 LaPlata 0100

Class will meet every Thursday and on Tuesdays for the first class meeting and for midterm exam # 2.

Grading:	Online Quizzes	130 points
	Enrichment	20 points
	Assignments	50 points
	Midterm Exam 1 (Oct 9)	100points
	Midterm Exam 2 (Nov 25)	100 points
	Final Exam (cumulative)	200 points
	<u>Lab</u>	<u>200 points</u>
	Total	800 points

Attendance Policy: The face-to-face class time will involve group work and application of knowledge obtained from the online portion, so your attendance is essential. Therefore, if you know you are going to miss class for a university sanctioned reason inform the instructor at least 72 hours before the class you will miss.

Exams: All examinations must be taken. Examinations not taken will be averaged into the final exam as a zero. There will be two mid-term examinations and a final examination. You must take the final examination. Make-up examinations will be considered only for valid medical reasons occurring on the day of the examination and only if a letter authorizing absence on that day is provided by a licensed physician.

Students with Disabilities: The University of Maryland provides upon request appropriate academic accommodations for qualified students with disabilities. Students who seek special accommodations due to disabilities must set up an appointment with Disability Support Services (DSS) in the Counseling Center, 301-314-7682. Students should download the DSS registration forms and bring appropriate documentation to the DSS office (Shoemaker 0126) prior to the meeting. Approved DSS forms should be turned to Dr. Quimby within the first week of class and one week prior to each exam.

Exam Re-grade Policy: Carefully review the exam key before submitting an examination for re-grade. Re-grades must be submitted to Dr. Quimby. Please note the following points:

1. Only exams done in ink will be eligible for re-grades.
2. Requests for a re-grade must be submitted (IN WRITING), along with your original exam answers, within 72 hours of the exam being returned to the class with a statement indicating which question(s) is to be reviewed and a detailed description for why the review is being requested. Either a non-specific plea to review the material or a request to review the entire examination will not be considered. No exams re-grades will be considered after this deadline.
3. Be advised that the ENTIRE exam may be subject to review if you submit it for a re-grade.
4. Decisions on re-grades are final (no appeals).

Honor Code: The Code of Academic Integrity of the University of Maryland will be enforced in this course. Any student found breaking any aspect of this code will be reported to the Honor Council. The Honor Council will have the option of giving an XF grade for any breach of the code.

Acts of dishonesty include:

- A. Cheating: Intentionally using or attempting to use unauthorized materials, information or study aids in any academic exercise.
- B. Fabrication: Intentional and unauthorized falsification or invention of any information or citation in an academic exercise.
- C. Facilitating Academic Dishonesty: Intentionally or knowingly helping or attempting to help another to commit an act of academic dishonesty.
- D. Plagiarism: Intentionally or knowingly representing the words or ideas of another as one's own in any academic exercise.

The Student Honor Council proposed and the University Senate approved an honor pledge that reads:

“I pledge on my honor that I have neither given nor received any unauthorized assistance on this examination.”

Unless you are specifically advised to the contrary, the Pledge statement should be handwritten and signed on the front cover of all papers, projects, or other academic assignments submitted for evaluation in this course. Students who fail to write and sign the Pledge will be asked to confer with the instructors.

Cell Phone Policy: Cell phones are to be in silent mode at all times during class meetings and are not to be taken out at any time during exams.

Class Schedule:

Week	Topic	Readings
1	Visualizing Cells I	Chapter 9 (Pages 580-583; 586-593). Please refer to the online module for specific sections.

2	Visualising Cells II	Chapter 9 (Pages 592-597). Please refer to the online module for specific sections.
3	Membranes I (Self assembly of the lipid bilayer and the Fluid Mosaic Model)	Chapter 10, Membrane Structure (pages 617-635 in the textbook for overview of cellular membranes)
4	Membranes II and Secretory Pathway I (protein translocation & role of lipid domains in sorting of proteins through the secretory pathway)	Chapter 12, Intracellular Compartments and Protein Sorting (pages 723-739 in the textbook for detailed examination of protein translocation into the ER)
5	Secretory Pathway II (quality control and protein processing in the secretory pathway & protein machinery in vesicular transport)	Chapter 12: Intracellular Compartments and Protein Sorting p736-743 and Chapter 13: Intracellular vesicular traffic, p 771-778
6	Membrane Transport	Chapter 11 P651-58, 667-71, 676-81 (see online assignment for specific sections)
7	Cytoskeleton	Chapter 16 p987-993, 996, 999-106, 1009-10 (see online assignment for specific sections)
8	Motor Proteins and Motility	Chapter 16 p1021-1039, 1041-3 (see online assignment for specific sections)
9	Adhesion and Extracellular Matrix	Chapter 19 p1158-63, 1182-3, 1193-1202 (see online assignment for specific sections)
10	Signal Transduction I	Protein function, chapter 3, pages 152 to 158 (including paragraph on affinity constant;

		<p>Ion channels and the electrical properties of membrane, chapter 11, pages 667 to 673;</p> <p>Some G-proteins activate PLC and Ca²⁺ signaling chapter 15, pages 909 to 916.</p>
11	Signal Transduction II	Cell-cycle control, chapter 17, pages 1060 to 1066 and pages 1101 to 1112
12	Cell Energetics I	Chapter 2: 65-103 How Cells Obtain Energy from Food; Chapter 14, 816-817 Structure of Mitochondria
13	Cell Energetics II	Chapter 14: 817-824 Refer to segments on Chemiosmotic Coupling, Structure of Mitochondria, Structure of Chloroplasts, Electron Transport Chains