SYLLABUS | Bio 46: Cell Biology

Lecture (E+): M/W 10:30-11:45 (3 SHUs) | Anderson Room 206

<table>
<thead>
<tr>
<th>Contact</th>
<th>Office Hours</th>
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<tr>
<td><strong>Course Instructor:</strong></td>
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<tr>
<td>Dr. Lauren Crowe</td>
<td><a href="mailto:Lauren.crowe@tufts.edu">Lauren.crowe@tufts.edu</a></td>
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<tr>
<td></td>
<td>Tuesdays 2:00 pm – 3:30 pm</td>
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<td></td>
<td>Fridays 10:30 am – 12:00 pm</td>
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<td></td>
<td>Robinson 368</td>
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<td><strong>Course TA:</strong></td>
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<tr>
<td>Gina Mantica</td>
<td><a href="mailto:Gina.mantica@tufts.edu">Gina.mantica@tufts.edu</a></td>
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<tr>
<td></td>
<td>Wednesdays 9:15-10:15 am</td>
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<td>Robinson 350</td>
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SIS Catalog Description

Basic concepts of cellular organization, function, regulation. Emphasis on molecular/biochemical approach to fundamentals of bioenergetics; plasma membrane functions such as transport, secretion, and signal transduction; organelle function and biogenesis; cell growth and division. Three lectures. Requires completion of BIO 0013 or equivalent.

Student and Instructor Goals and Expectations

Welcome to Cell Biology! By the end of this course, you should be able to:

- Demonstrate an understanding of common cellular and molecular biology research methods.
- Read primary literature documents critically and analytically.
- Understand how the biochemical properties of macromolecules affect their structure and function within a cell.
- Demonstrate an understanding of the effects and disease states caused by perturbations in cellular processes.

I expect all students to check their Canvas pages and Tufts emails regularly, engage with each other during and outside of class, and come to class prepared. Feel free to contact me concerning any problems you are experiencing in this course. You do not need to wait until you receive a bad grade before asking for assistance. Keep in mind that office hours are not only a time to address problems. I’d be happy to talk with you about your areas of special interest, help brainstorm topics, etc.

In turn, you can expect to hear back from emails within 24 hours (except on weekends) and expect me to do whatever I can to facilitate your learning. I also aim to elicit your feedback regularly! Expect a mid-semester evaluation of the class, and feel free to provide anonymous feedback at any time (see Canvas for more info). I am committed to the principle of universal learning. This means that our classroom, virtual spaces, practices, and interactions should strive to be as inclusive as possible.
Materials

Electronic:
- Canvas (https://login.canvas.tufts.edu/)
- Poll Everywhere (https://access.tufts.edu/poll-everywhere); email edtech@tufts.edu for issues
- A charged, portable internet-enabled device, such as a phone, laptop, or tablet. Downloading the apps for Canvas and/or Poll Everywhere will make your life easier!
  - Please feel free to use your computer for notetaking, but keep in mind that other students may be distracted if you start browsing cute cat videos or other non-relevant material

Textbook:
- Essential Cell Biology: 5th Edition (Smartwork5 access not required but recommended)
  Alberts | Hopkin | Johnson | Morgan | Raff | Roberts | Walter
Norton Publishing

Accommodation & Mental Health Information:

Tufts University values the diversity of our students, staff, and faculty, recognizing the important contribution each student makes to our unique community. Tufts is committed to providing equal access and support to all qualified students through the provision of reasonable accommodations so that each student may fully participate in the Tufts experience. If you have a disability that requires reasonable accommodations, please contact the Student Accessibility Services office at Accessibility@tufts.edu or 617-627-4539 to make an appointment with an SAS representative to determine appropriate accommodations. Please be aware that accommodations cannot be enacted retroactively, making timeliness a critical aspect for their provision.

As a student, there may be times when personal stressors or emotional difficulties interfere with your academic performance or well-being. The Counseling and Mental Health Service (CMHS) provides confidential consultation, brief counseling, and urgent care at no cost for all Tufts undergraduates as well as for graduate students who have paid the student health fee. To make an appointment, call 617-627-3360. Please visit the CMHS website: http://go.tufts.edu/Counseling to learn more about their services and resources.

Diversity Statement:

In an ideal world, science would be objective. However, much of science is subjective and is historically built on a small subset of privileged voices. In this class, we will make an effort to recognize the accomplishments from a diverse group of scientists, but limits still exist on this diversity. Integrating a diverse set of experiences is important for a more comprehensive understanding of science. Please contact me (in person or electronically) or submit anonymous feedback if you have any suggestions to improve the quality of the course materials (see the Canvas home page). I aim to create a welcoming learning environment for the well-being of all students. If you feel like your performance in the class is being impacted by your experiences outside of class, please don’t hesitate to come and talk with me. I want to be a resource for you. You can also submit anonymous feedback (which will lead to me making a general announcement to the class, if necessary, to address your concerns). If you prefer to speak with someone outside of the course, the Center for STEM Diversity is an excellent resource.

Academic Honesty:

You will work collaboratively throughout the course to solve problems. Your work on exams and in-class quizzes should be exclusively your own. Cheating and plagiarism will be reported to the university. I encourage you to review the Academic Misconduct Policy in the Code of Conduct here: https://students.tufts.edu/student-affairs/student-code-conduct/academic-integrity-resources.
Grading

Quizzes:

This class utilizes flipped class pedagogy, which means that you will be responsible for background material outside of class so we can actively engage with it in class. Every week, you will be assigned background reading from the textbook and other articles along with a worksheet for guided reading and some sample problems.

A brief (5 question) quiz based directly on the guided reading worksheet will be given on the first class of the week promptly at the start of class. Your lowest quiz score will be dropped. These quizzes are designed to hold you accountable for the homework and to assess your understanding of key course concepts before we actively engage with that material in class. They also provide me with feedback on common misconceptions and topics to revisit/clarify.

Engagement:

Research shows that we learn the best when we engage with our peers and talk through our understanding of the material. You are required to actively engage in presented questions using Poll Everywhere. Questions will be presented during class using Poll Everywhere, and you will be able to choose an answer that will be recorded. Your participation in these exercises (regardless of your answer) will contribute towards your final grade. You will get credit for each day you answer at least half of the day’s questions, and up to two absences will be removed from the final engagement grade. Thus, credit will not be given for absences, and you cannot make up missed questions.

Exams:

You will have three in-class exams worth 15% each (dates on course schedule). Exams will cover each unit – however, the units are designed to build upon each other, and so previous material may be included. Exams will be a mixture of multiple choice, short answer, and long answer questions. You will have the opportunity to receive extra credit on exams by completing exam reflections and exam corrections.

Lit Analysis and Poster Presentation:

In class, we will work on the skills needed to find, understand, and analyze primary research articles in the field of cell biology. For the Primary Literature Analysis assignment, will compare a primary research article to a scientific journalism article. The Poster Presentation is a large semester-long project in which you will work with a partner (or 2) to present on a single mutation disease and delve into the cell biological causes of the disease using primary literature. More information will be provided in class and on Canvas.

Late work/missed class policy:

No make-up quizzes or exams will be given. Your lowest quiz score will be dropped; thus, if you miss a quiz, it won’t affect your grade. Up to one exam may be missed for excused absences only; proper documentation must be provided. Unexcused absences for exams will result in a zero. Any non-electronic assignments should be emailed to Dr. Crowe or turned in on Canvas before the end of the day. Late assignments will have a deduction of 5% for each class period they are delayed unless otherwise noted. Extensions on assignments may be provided on a case by case basis, but only if requested at least 24 hours in advance of the deadline. Extensions may not be requested for quizzes, exams, or poster presentations.
**Additional Course Resources**

**Class Canvas Site:**

Information for this course will be primarily distributed through the Canvas site. Announcements, slides, reading and video assignments, and homework sets will all be posted on the site. Make sure you can access the site at the beginning of the semester. *Please check the course website and your Tufts email account daily.*

**Out of class – Discussion Page:**

Out of class, there are many ways for you to find support and get help for this course! Besides office hours, you can create threads on the Discussion page on Canvas. Use this discussion page to ask a question to your peers, set up study groups, and clarify points. This forum will be moderated by the instructor and TA.

**Slides:**

I will post lecture slides before each class on our course Canvas site via the Course Schedule Page at least 24 hours prior to the start of class. I encourage you to bring them to class, either printed or on a portable electronic device, to facilitate note taking. Annotated slides will also be provided from class.

**Course Schedule**

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<th>Week</th>
<th>Topics and Readings</th>
<th>Important Dates</th>
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| **Week 1** | Wednesday, January 15: Welcome, Introduction to Cells  
Readings: Syllabus, Ch 1 |  |
| **Week 2** | Monday, January 20: No class (MLK Day)  
Wednesday, January 22: Cellular Biochemistry and Macromolecules  
Readings: Ch 2 | Jan 22 – Quiz |
| **Week 3** | Monday, January 27: Protein Structure  
Wednesday, January 29: Protein Function  
Readings: Ch 4 | Jan 27 – Quiz |
| **Week 4** | Monday, February 3: Membrane Structure  
Wednesday, February 5: Transport Across Membranes  
Readings: Ch 11, Ch 12 | Feb 3 – Quiz  
Feb 5 – Disease Rationale Assignment Due |
| **Week 5** | Monday, February 10: Action Potentials  
Wednesday, February 12: Exam 1  
Readings: Ch 5, Ch 6 | Feb 10 – Quiz  
Feb 12 – Exam 1 (Ch 1, 2, 4, 11, 12) |
| **Week 6** | Monday, February 17: No class (President’s Day)  
Wednesday: February 19: DNA Replication  
Thursday, February 20: DNA Repair  
Readings: Ch 7, Ch 10 | Feb 19 – Quiz  
Feb 20 – Monday schedule (class!)  
Feb 20 – Database Assignment Due |
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<th>Week</th>
<th>Monday</th>
<th>Wednesday</th>
<th>Readings</th>
<th>Notes</th>
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<tr>
<td>7</td>
<td>February 24: Transcription</td>
<td>February 26: Translation</td>
<td>Ch 8</td>
<td>Feb 24 - Quiz</td>
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<td>March 2: Gene Expression</td>
<td>March 4: Exam 2</td>
<td>Ch 15, Ch 17</td>
<td>Mar 2 – Quiz</td>
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<td>Mar 4 – Exam 2 (Ch 5, 6, 7, 8, 10)</td>
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<td>March 9: Cytoskeleton</td>
<td>March 11: Intracellular Transport</td>
<td>Ch 16</td>
<td>Mar 9 – Quiz</td>
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<td>Mar 11 – Annotated Bibliography Due</td>
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<td>March 16-20</td>
<td>Spring Break – no classes</td>
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<td>March 23: Cell Signaling Pt I</td>
<td>March 25: Cell Signaling Pt II</td>
<td>Ch 18, Ch 20 (ECM and Connective Tissues, Epithelial Sheets and Cell Junctions)</td>
<td>Mar 23 – Quiz</td>
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<td>Mar 25 – Primary Literature Analysis Project Due</td>
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<td>March 30: Cell Division and Control</td>
<td>March 1: Cell Interactions</td>
<td>Ch 20 (Stem Cells and tissue renewal, Cancer)</td>
<td>Mar 30 - Quiz</td>
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<td>April 6: Stem Cells</td>
<td>April 8: Cancer</td>
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<td>April 6 – Quiz</td>
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<td>April 13: Exam 3</td>
<td>April 15: Peer Review</td>
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<td>April 13 – Exam 3 (Ch 15-18, 20)</td>
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<td>April 15 – Rough Draft of Poster Materials due for Peer Review</td>
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<td>April 20: No classes (Patriot’s Day)</td>
<td>April 22: Presentations</td>
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<td>April 21 – Poster Presentation Material due</td>
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<td>April 27: Presentations</td>
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