

**Biology 3334.001**  
**Cell Biology Lecture**  
**Fall 2024**  
**Course Syllabus**

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<http://www.uttyler.edu/Biology>

**Class time:** Tue. Thur. 12:30- 1:50 PM

**Class Location:** RBN 02012

**Office Hours:** Tues & Wed. 10:00 am-11:00 or by appointment.

**Main Text**

Karp, Cell and Molecular Biology

ISBN: 9781119601609;    9<sup>th</sup> Edition (Used 8<sup>th</sup> edition will be fine as well)

**Optional/Supplemental Read**

Alberts, Essential Cell Biology

ISBN: 978-1-324-03334-9;    6<sup>th</sup> Edition

I have also requested an ebook version of these text books for our library and I hope they will have them available soon.

**Course Description**

Biology 3334 is an upper division course that investigates the molecular basis for cellular structure and function, and assumes prior exposure to General Biology I (1306 or equivalent) and Organic Chemistry I. The course complements General Biology and other introductory courses by providing a more thorough presentation of some of the major aspects of cellular structure and function. It is also a great foundation course for other advanced biology courses including physiology and Immunology. Finally, you will be challenged to distill and communicate scientific knowledge in an effort to improve critical thinking and analytical skills. So, please enthusiastically read assigned articles, extract information, and synthesize a brief discussion summary worth 10% of your course grade. Course material and assessments will be based on the learning goals and objectives of each lecture.

**Course objectives and students learning outcomes**

- Describe the principles of the structure and function of cellular components.
- Specify the regulatory mechanisms within and between cells at the molecular level.
- Develop critical thinking skills and problem-solving strategies.

## Teaching Strategies

Please be prepared for a “student centered, active learning” approach, instead of the traditional lecture class, where students are active participants in class.

### Protocol

- Prior to class :The course PowerPoints will be posted on Canvas ahead of schedule with the expectation that students use them as a guide in reading corresponding topics in the textbook with the intention of being prepared for Q/A and discussion of challenging concepts during class.
- During class: Several quizzes will be given to evaluate students’ proficiency with the material and to identify areas of confusion for the class. The answer cards will indicate your attendance and will be 5% of your final grade, regardless of score. Your participation in discussion of the rationales for answers will secure 5/10 points for the session.
- In-class time: This will be spent in recapping and discussion of difficult materials in an effort to clear up areas of confusion.

This learning approach will succeed if you do your share of reading ahead of time and come to class with questions that you need additional clarification. Additional after-class review of the topics with fellow classmates will ensure a deeper level of comprehension of the concept and secure a favorable test score.

### Attendance/Participation

Attendance and participation in Q/A and class discussion are essential to succeed in this class. Your attendance will be recorded on Canvas for each session and your participation will be evidenced by your answers to class Q/A) and discussion topics on Canvas - To read other students’ posts on discussion page, you will need to enter your answer first; you can then go back and edit your own answer if you wish. I encourage working in teams in class as well as preparing for the exam. I will hold a “review session” over the past lecture in the beginning of each class in lieu of a review session prior to each exam.

If you miss class, it is your responsibility to contact your teammates to get notes and other announcements made during class.

Please make sure to activate the “**Announcement**” in your account Notification Preferences to receive emails regarding new course announcements on Canvas.

### Grading Policy

The final grade will be determined as follows- Any modifications to this policy will be communicated to class ahead of time

|   |       |
|---|-------|
| <b>Attendance and Participation</b>   | 10%   |
| <b>Online Quizzes</b> (time sensitive)                                      | 10%   |
| <b>Online Discussions of Research Articles</b> (time sensitive)             | 10%   |
| <b>Exams</b> - In-person, Scantron.   |       |
| Midterm (3 exams) & Final   | 70%   |
| Exam 1 (10%): Chapters covered since Aug 27.                                |       |
| Exam 2 (10 %): Chapters covered since Exam 1.                               |       |
| Exam 3 (20 %): Chapters covered since Exam 2.                               |       |
| Final (30 %): Chapters covered since Exam 3 + key concepts in cell biology. |       |
| <hr/>   |       |
| Total   | 100 % |

Letter Grades will be assigned based on the following point levels.

A: 90 - 100; B: 80 - 89; C: 70 - 79; D: 60 – 69; F < 60

**Attendance and Participation (10%)** This will be an interactive class and students are expected to read the assigned material before lecture sessions, participate in class Q/A and discussion.

**Online Quizzes on Canvas (10%)**: You will have a prescheduled class quiz at the conclusion of each chapter. No make-up quiz will be given. I will drop 2 lowest quiz grades for each student. So, if you miss a quiz for any reason, including illness and excused travel absence, that quiz will be counted as a dropped quiz score.

**Online Discussion of Journal Articles (10%)**: This online assignment will help you to explore more on the topics we discussed in class, provide opportunity to extract and synthesize scientific write-ups, and boost your critical thinking and analysis skills. For each assigned article posted on Canvas, you will ask to mention the goals and hypothesis of the research and briefly discuss the findings in relation to the topics discussed in class. You will have to post your write up on the discussion page of Canvas. Please note that you will have to post your write up first in order to be able to see and read other replies

**Exams (70%)**: The exam will consist of multiple choice, fill-in-blank, and true/false questions, which will cover material from corresponding chapters. No make-up exams will be given without prior notification except medical emergencies with physician's office note. Chapter readings in your Textbook are to be used as reference material to class lectures and PPs.

No additional work for extra credit will be given at the end of the semester.

**Grade rounding**: If your final course grade is within **0.5 point of the next letter grade**, it will be rounded up automatically. The only other adjustment that will be made is if the final percentage is within **one point of next letter grade** and, the student has missed three or less lectures throughout the semester.

**Academic Integrity**: Students should be aware that absolute academic integrity is expected of every student in all undertakings at The University of Texas at Tyler. Failure to comply can result in strong university-imposed penalties.

### **Documentation**

- **University Note**: Have your professor or coach email me a letter explaining the reason for the absence due to a prescheduled University excused absence.
- **Doctors Note**: If you are sick, please bring proof of your appointment, and have the doctor explain that you were indeed sick and could not attend class.
- **Civil documentation**: If there are other extenuating circumstances, please provide the obituary, police report, court documents, or other evidence explaining the absence.

### **Class Expectations**

- Students will be expected to follow the University of Texas at Tyler rules regarding any infectious diseases- Simply, stay home and take care of yourself if you don't feel well.
- Be Courteous and on time.
- **Silence cell phones** and other electronic devices, and do not answer your phone or text while in class.

- **Discussion is encouraged during the lecture**, so please feel free to ask questions, seek clarification, etc. If you need extra help, or we are pressed for time during class, please see me during my office hours.
- **You are strongly urged to read the material ahead of time as this is a fast-paced, interactive class and we will be covering a large amount of material.** Traditional study guidelines recommend at least 3 hours of study time per credit hour. Therefore, you should plan to spend at least 9 hours a week outside of class time on this course. I encourage group reading and discussion both in- and out- of class.
- **Office Hours:** Questions about the content, exams questions and grades, better understand the discipline, and make career connections are welcomed during office hours. In some instances, we may be discussing grades or other private matters, so please wait for your turn.

### **Copy right- Recording of class sessions**

Class sessions may be recorded by students enrolled in this course. Recordings that contain personally identifiable information or other information subject to FERPA shall not be shared with individuals not enrolled in this course unless appropriate consent is obtained from all relevant students. Class recordings are reserved only for the use of students enrolled in the course and only for educational purposes. Course recordings should not be shared outside of the course in any form without express permission.

**I RESERVE THE RIGHT TO MODIFY THIS SYLLABUS AT ANY TIME. THEREFORE, YOUR ATTENDANCE AND ATTENTION TO THE ANNOUNCEMENTS IN CANVAS ARE CRUCIAL BECAUSE IT WILL ASSIST YOU TO REMAIN CURRENT ON THE MATERIAL AND KNOW WHEN THE SYLLABUS MAY BE MODIFIED.**

### **General information** \_ *Resources for UT Tyler Students Success*

Please refer to “Student Resources” and “University Policies and Information” on the course Modules/Canvas.

### **Helpful Links:**

Pubmed: A resource for accessing biomedical literature.

- UT-Tyler Portal: <http://www.ncbi.nlm.nih.gov/pubmed?holding=txutrlib>

Genome browsers: These websites are repositories for genetic information. You can look at an entire chromosome using the genome browser or focus on more detailed information for a specific gene.

- National Center Biotechnology Information: <http://www.ncbi.nlm.nih.gov/>
- European Genome Browser: <http://www.ensembl.org/index.html>
- DNA Data Bank of Japan: <http://www.ddbj.nig.ac.jp/>
- UC Santa Cruz genome browser: <http://genome.ucsc.edu/>

Gene-specific informatics: These websites provide more detailed information on genes and genetic disorders.

- Online Mendelian Inheritance in Man (OMIM): <http://www.omim.org>
- Genecards: <http://www.genecards.org/>
- Gene Tests: <http://www.genetests.org>
- Gene Reviews: <http://www.ncbi.nlm.nih.gov/books/NBK1116/>

Selected Animal Specific Informatics: These websites focus on the most popular genetic animal models.

- Mouse (*Mus musculus*) Informatics: <http://www.informatics.jax.org/>
- Zebrafish (*Danio rerio*) Informatics: <http://zfin.org/>
- Fly (*Drosophila melanogaster*) Informatics: <http://flybase.org/>
- Caenorhabditis elegans* informatics: <http://www.wormbase.org/>
- Saccharomyces cerevisiae* informatics: <http://www.yeastgenome.org/>

Programs to look at DNA sequence: Sanger sequencing produces chromatograms, as a read out. This readout can be viewed using a number of programs. These will convert the data into a string of nucleotides that can be analyzed further.

- A Plasmid Editor (ApE) - <http://biologylabs.utah.edu/jorgensen/wayned/ape/>
- CLC sequence viewer - <http://www.clcbio.com/products/clc-sequence-viewer/>
- FinchTV - <http://www.geospiza.com/Products/finchtv.shtml>
- Sequence Manipulation Suite: <http://www.bioinformatics.org/sms2/index.html>

General Science Resources:

- HHMI Biointeractive: <http://www.hhmi.org/biointeractive/>
- CSHL DNA interactive: <http://www.dnai.org>
- Science Friday Life Science Education: <http://www.sciencefriday.com/teacher-resources/index.html?subject=3#page/full-width-list/1>
- GeneEd: [http://geneed.nlm.nih.gov/topic\\_subtopic.php?tid=1](http://geneed.nlm.nih.gov/topic_subtopic.php?tid=1)
- Cell and Molecular Online: <http://www.cellbio.com/education.html>
- Cells Alive: <http://www.cellsalive.com>
- Khan Academy: <https://www.khanacademy.org/science/biology>
- NIGMS: <http://publications.nigms.nih.gov/order/>
- Evolution and cell biology:  
<http://evolution.berkeley.edu/evolibrary/teach/undergradsyllabus.php>

**Tentative Schedule:** Please refer to next page:

| Lecture Schedule |  |                     |
|------------------|--|---------------------|
| Date             | Topic  | Chapter             |
| Aug<br>27, 29    | Syllabus overview,<br>Introduction to the study of Cell and Molecular<br>Biology         | 1                   |
| Sep<br>3, 5      | Students read:<br>The Chemical Basis of Life Pertained to plasma<br>membrane (Ch 4)      | 2                   |
|                  | Structure & Function of The Plasma Membrane  | 4                   |
|                  | <a href="#">First drop for non-payment</a>   |                     |
| 10, 12           | Plasma Membrane – Neural impulse<br><br><a href="#">Sept 9<sup>st</sup>: Census date</a> | 4                   |
| 17               | Plasma Membrane – Clinical application   | 4                   |
| 19               | <b>Exam 1 - in-person, Scantron</b>  | <b>1, 2 &amp; 4</b> |
| 24, 26           | Cell signaling   | 15                  |
| Oct<br>1, 3      | Cell –Environment Interactions   | 7                   |
| 8, 10            | Endoplasmic Membrane Systems (EMS)   | 8                   |
| 15               | First drop for non-payment   | 8                   |
| 17               | <b>Exam 2, in-person, Scantron</b>   | <b>7, 8, 15</b>     |
| 22, 24           | Bioenergetic – Metabolism  | 3                   |
|                  | Aerobic Respiration  | 5                   |
| 29, 31           | Aerobic Respiration  | 5                   |
| Nov<br>4         | <a href="#">Last day to withdraw without penalty</a>                                     | -                   |
| 5, 7             | The Cytoskeleton & Cell Mobility   | 9                   |

| Lecture Schedule |                                  |                   |
|------------------|----------------------------------|-------------------|
| Date             | Topic                            | Chapter           |
| 12               | Exam 3, in-person, Scantron      | 3, 5, 9           |
| 14               | Immune System                    | 17                |
| 19, 21           | Immune System<br>Immunotherapy   | 17<br>16          |
| 25, 29           | Thanksgiving Holidays            | -                 |
| Dec<br>3, 5      | Cancer Cell Biology              | 16                |
| Dec 9-13         | Final Exams -in-person, Scantron | 16, 17 &<br>..... |