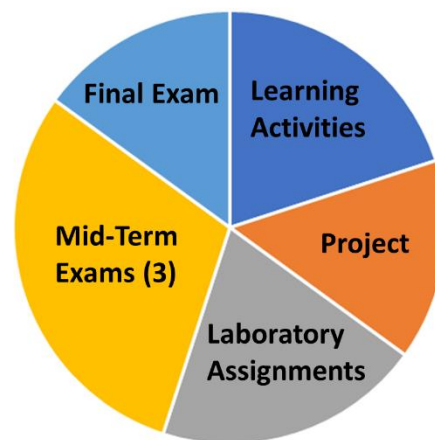




- Describe cellular transport and signal transduction processes and the relevance of dynamic membrane structures.
- Read and evaluate published primary research in biochemistry.
- Develop advanced laboratory skills and apply relevant biochemical principles for understanding and troubleshooting work in the biochemistry lab.
- Record and analyze biochemical data accurately and effectively.

### Evaluation of Learning:

Engagement and Learning Activities	20%
Drug Function Project	15%
Laboratory Assignments	20%
Mid-Semester Exams (3)	30%
Comprehensive Final Exam	15%



Final letter grades will be assigned on a standard plus/minus scale.

### Engagement and Learning Activities (20%):

Throughout the semester we will have a variety of assigned “Learning Activities” designed to help you practice and gain mastery of course material. These will be assigned in-class, included on Road Maps, and posted on D2L. These could include homework assignments, quizzes, guided notes, extra practice problems, class surveys, post-exam surveys, reflection questions, etc.

### Drug Function Project (15%):

This semester you will investigate the mechanism of a unique pharmaceutical drug that regulates an enzymatic function related to disease. Through scientific literature you will learn about the drug structure and function, relevant biological pathway, and the enzyme regulated. You will prepare and present a poster about your findings. This project will be scaffolded through several assignments and an official prompt and specific assignment questions will be provided later in the semester. Guidance and assistance in navigating scientific literature and in poster preparation will be provided.

### Exams:

We will have three exams during the semester and one comprehensive final exam that will require the full class period and will test your ability to integrate fundamental course concepts on the applied, analytical, and synthetic levels. There could also be a take-home component to an exam, as appropriate. Exam dates are listed on the schedule.

**Make-up Policy:** If you know you will miss an exam ahead of time (for an absence excused based on Millersville’s approved guidelines), you must inform me one week in

advance, ideally in person. You will be expected to take the exam before the scheduled date. If you are sick on the day of an exam, we will work together for you to make up the exam as soon as possible. Any unexcused absence from an exam will result in a zero.

**Testing Accommodations:** Any student who meets the eligibility requirements to receive academic accommodations through learning services should speak with the Office of Learning Services in Lyle Hall as early in the semester as possible. You should give me a Testing Accommodation request form (“green sheet”) as soon as possible and plan to take quiz/exams on the same day and time at the Office of Learning Services. For more information see: <http://www.millersville.edu/learningservices>

## Laboratory

Biochemistry 2 laboratory will focus on providing you with additional laboratory experience in common techniques used in biochemistry and molecular biology. We will have five (5) laboratory experiments some of which will require several weeks to complete and additional laboratory activities. Please let me know if you have any special circumstances (allergies, pregnancy, etc) that might require alternate experimental arrangements for you to work safely in lab.

- Lab Evaluation for each experiment will consist of:

Pre-Lab Questions	5 pts
Data Analysis/Post-lab	variable
Laboratory Notebook	5 pts
- Laboratory activities will be worth ~15-30 pts depending on the lab and there could be additional mid-lab learning activities to complete depending on the experiment.
- You are expected to respect and follow all safety instructions given in lab.
- Information about laboratory experiments (background info, protocols, information, representative data) will be posted and accessible on D2L.
- Pre-lab questions will be completed in D2L and will be due **8 am on Wednesday**.
- Lab assignments (D2L data file or quizzes) should be submitted to D2L by the deadline.

### Tentative Course Schedule\*

<b>Date</b>	<b>Chapter</b>	<b>Topic</b>	<b>Lab</b>
1/16	14, 16	Glycolysis and Gluconeogenesis, Glycogen	Welcome, Check-In, & Protein Isolation
1/18	14	Glycogen Metabolism and Regulation	
1/23	17	Lipid Transport and Oxidation	Protein Isolation and Stability
1/25	21	Lipid Biosynthesis; Regulation of Lipid Metabolism	
1/30	21	Cholesterol Mechanism and Therapies	
2/1	18	Protein Catabolism	
2/6	18	Amino Acid Catabolism, Glc-Ala Cycle	Enzyme Purification and Activity
<b>2/8</b>		<b>Exam 1; THE due 2/15*</b>	
2/13	18, 22	Urea Cycle, Tryp and AA Biosynthesis	
2/15	23	Organ Specialization, Biochemical Signaling	
2/20	12	Biochemical Signaling	
2/22	23	Metabolic Disorders	
<b>2/27</b>		<b>Exam 2; THE due 3/3*</b>	
2/29!	various	Metabolic Disorders / Case Study	
<b>3/5-8</b>		<b>NO CLASSES - SPRING BREAK</b>	
3/12	22	Purine and Pyrimidine Biosynthesis	
3/14	22	RNR, TS, Nucleotide Catabolism	Protein Modeling and Poster Preparation
3/19	22	Nucleic Acid Metabolic Disorders	
3/21	24	Nucleic Acid Structure and Topoisomerase	
3/26	25	DNA Replication and Repair	GMO PCR Experiment
3/28	26	Transcription	
4/2	26	Transcription Factors; Nucleic Acid-Protein Interactions	
4/4		<b>Exam 3; THE due 4/12*</b>	Lipid Analysis, Poster Peer Review
4/9	26	RNA Processing: Capping, PolyA/U	
4/11	26	RNA Splicing; RNP Complex Investigation	
4/16	27	Translation: tRNA and tRNA synthetases	
4/18	27	Ribosome Structure and Function	Poster Session
4/23	28	Regulation of Gene Expression	
4/25	28	Regulation of Gene Expression	
<b>5/4</b>		<b>Final Exam: Tues 4/30, 8 - 10 am</b>	

\* subject to change

## **Course Policies:**

### Class Attendance and Participation

You are expected to attend all classes prepared to actively participate in the classroom, including asking questions, responding to questions, and contributing to group, class, and laboratory discussion. You are responsible for all material presented in class and distributed via D2L. You are also expected to complete all of the Laboratory Experiments. Only graded work missed for an absence excused based on Millersville's approved guidelines (found online and at the end of the syllabus) may be made up. Please contact me as soon as possible to reschedule. Any graded work conducted outside the scheduled time may differ significantly in form and exact content from the in-class version.

### Illness Policy

So far this winter we have seen a rise in respiratory illnesses including COVID, flu, and RSV in addition to other illnesses. If you have any signs of illness, please stay home and prioritize your recovery. You are welcome to wear masks in the classroom or laboratory space if you feel more comfortable doing so.

- I highly recommend that students come to class to maximize learning of Biochemistry. However, if you feel unwell please stay home.
- If you are unable to attend class, please contact a classmate to obtain notes. Any materials used will be posted on D2L.
- If you are unable to attend lab, please contact me for a suitable alternative assignment.
- I am able to schedule in-person or virtual office hours/meetings to discuss course content.
- If you are experiencing a prolonged illness (more than two (2) weeks), please contact me.
- It is possible that you or I might have frequent and unexpected childcare or school closures. If you are a primary caregiver of a child (e.g. parent or guardian), please contact me and we can set up a custom plan for how to manage attendance and assignments if there are closures. Likewise, I will share plans if I am unable to attend in person.
- If there are other situations that will impact a student's ability to participate in this course, please contact me as soon as possible.

### Computer Resources

Students are expected to use D2L for CHEM 327. This provides mechanisms for contact, distribution of information, and data, submission of written work, completion of peer reviews, etc. Students are also responsible for all course information sent to their campus email address.

### Diversity, Inclusion, and Anti-Racism Policy

This course is a judgement free and anti-racist learning environment. Our class includes students from a wide variety of social identities and life circumstances. Everyone will treat one another with respect and consideration at all times or be asked to leave the classroom.

As your instructor I will:

- Learn and correctly pronounce everyone's name
- Use correct pronouns for those who wish to indicate this to me/the class
- Work to accommodate/prevent English language related challenges

If you tell me that you are having trouble, I will not judge you or think less of you. You do not owe me an explanation of your health (physical or mental) or the health of your loved ones; but you are welcome to tell me and I will listen. If I can not help you, I will find someone who can. If you need help or more information, please ask and I will work with you.

If we have any virtual sessions children and pets are welcome to attend live sessions as long as you are considerate of other learners. In general, I suggest keeping your microphone muted when not speaking to avoid outside noise for the rest of the class.

University Inclusion Statement: <https://www.millersville.edu/dsj/inclusionstatement/>

Preferred Name FAQs: <https://www.millersville.edu/dsj/inclusionstatement/preferred-name-faqs.php>

Privacy Rights under FERPA: <https://www.millersville.edu/registrar/ferpaforstudents.php>

### Academic Honesty

Students are expected to abide by the policy outlined by Millersville University shown below. Students will collaborate on collecting, interpreting, and reporting data. Students are expected to contribute equally on collaborative work. Fabrication of data or plagiarism in preparing reports will NOT be tolerated in this course. Students should not post course material on online study sites such as Chegg. Anyone caught cheating in these ways will be assigned a score of zero on the work.

I am also aware of the recent emergence of AI software such as ChatGPT as a means of completing assignments (essays, papers, etc). Use of this software to complete assignments is plagiarism, as defined in the Millersville University Student Handbook. If someone uses AI assignments their grade will be lowered or given a score of 0. Continued use of this software will result in harsher academic measures.

According to Millersville University's Academic Honesty Policy: *"Students of the University are expected to be honest and forthright in their academic endeavors."* If you break the academic honesty policy, there are severe penalties. A failing grade will be assigned and you may be prosecuted by an Academic Review board. Actions that violate the Academic Honesty Policy are:

1. Plagiarism: inclusion of someone else's words, ideas, or data as one's own work.
2. Fabrication: falsification of research or other findings.
3. Cheating: the act or attempted act of deception by which an individual tries to misrepresent that the individual has mastered subject matter in an academic project or the attempt to gain an advantage by the use of illegal or illegitimate means. Submitting in-class participation cards for another student is considered cheating.
4. Academic Misconduct: violation of University policies by tampering with grades or participating in the distribution of any part of a test before its administration.

For more information see:

- <https://www.millersville.edu/cae/teaching-and-learning/academic-integrity.php>
- <https://www.millersville.edu/about/administration/policies/pdf/academics/academic-policy-academic-honesty-and-dishonesty.pdf>

## Student Conduct and Community Standards:

<https://www.millersville.edu/studentconduct/files/studentcodeofconduct.pdf>

## Official Attendance Policy

1. Students are expected to attend all classes. It is the student's responsibility to complete all course requirements even if a class is missed. If a student misses class for an officially excused reason, then the student is entitled to make up the missed work but only at the convenience of the faculty member. Responsibility for materials presented in, assignments made for, and tests/quizzes given in regularly scheduled classes lies solely with the student.
2. The Millersville University policy states that faculty will excuse absence for the following reasons:
  - a. personal illness
  - b. death or critical illness in the family
  - c. participation in a university-sponsored activity
  - d. jury duty
  - e. military duties
  - f. religious holidays
3. Faculty judge the validity of student absences from class within the University's approved guidelines and may require documentation for excuse absences. Faculty will evaluate any reason, other than those listed above, for a student missing class and determine whether the absence is justified. In these circumstances, a student may make up missed work at the discretion of the instructor.
4. In the case of foreseeable absences, students are encouraged to notify the faculty member in advance. A student who will miss class due to participation in an official University activity must notify the instructor well in advance of the activity to assure that the absence is excused.
5. For more information: [www.millersville.edu/registrar/faculty/attendance\\_policy.php](http://www.millersville.edu/registrar/faculty/attendance_policy.php)

Delay and Cancellation Delay Policy: <https://www.millersville.edu/delays.php>

## Land Acknowledgement:

We would like to recognize the Native peoples of the lower Susquehanna River basin, those known and those unknown to us, who have stewarded the land, upon which Millersville University sits, for thousands of years. We acknowledge that the land on which we gather, study, and work is the ancestral land of the Conestogas, Susquehannocks, Shawnee, and others. One group, the Shenks Ferry people, had a village adjacent to the campus. We pay our respects to the traditional occupants and caretakers of this land.

## Title IX Statement

Millersville University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to comply with the requirements of Title IX of the Education Amendments of 1972 and the University's commitment to offering supportive measures in accordance with the new regulations issued under Title IX, the University requires faculty members to report to the University's Title IX Coordinator incidents of sexual violence shared by students. The only exceptions to the faculty member's reporting obligation are when incidents of

sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. **Faculty members are obligated to report to the person designated in the University [Protection of Minors policy](#) sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred.**

Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at: [www.millersville.edu/titleix](http://www.millersville.edu/titleix)

#### Counseling Reminder

Students sometimes face mental health or drug/alcohol challenges in their academic careers that interfere with their academic performance and goals. Millersville University is a caring community and resources are available to assist students who are dealing with problems. The Counseling Center (717-871-7821) is an important resource for both mental health and substance abuse issues. Additional resources include: Health Services (717-871-5250), Center for Health Education and Promotion (717-871-4141), Campus Ministries, and Learning Services (717-871-5554).

#### Americans with Disabilities Act

Millersville University is committed to equality of opportunity and freedom from discrimination for all students, employees, applicants for admission or employment, and all participants in public University-sponsored activities. In keeping with this commitment, and in accordance with the Americans with Disabilities Act (ADA) the University will make every effort to provide equality of opportunity and freedom from discrimination for all members of the University community and visitors to the University, regardless of any disability an individual may have. Accordingly, the University has taken positive steps to make University facilities accessible to individuals with disabilities and has established procedures to provide reasonable accommodations to allow individuals with disabilities to participate in University programs. The University administration and management are obligated to report any allegation of discrimination to the appropriate office as defined in this policy.

**Please let me know how I may make accommodations in the classroom setting that will enhance and support your learning.**