# Mayville State University

## Elements of Biochemistry

## CHEM 360

Spring 2025
3 SH

### Course and Instructor Information

**Instructor Name:** Bob Miess

**Contact Information**: robert.miess@mayvillestate.edu, CB 108C, 34885

**Hours of Availability:** M@2, R@11, F@2, other times by arrangement; My schedule is posted on my office door.**Instruction Mode**: **Instructions:** on-campus face-to-face

**Time Zone**: All times indicated throughout this syllabus reflect Central Time (CT).

**Meeting Times and/or Location:** M, W, F 3:00 – 3:50, EB 117A

**Zoom Link:** https://mayvillestate.zoom.us/j/86102068831

### Course Materials and Technologies

**Required:**

**Biochemistry: A Short Course**, 4th Edition (2019), Tymozco JT, Berg JM, Gotto, Jr, GJ, and Stryer, L, W.H. Freeman (Macmillan Learning), New York, NY.

Spreadsheet application for graphing and analyzing data

### Course Description

An upper-level one-semester course designed to introduce students to biochemistry. This course covers topics of protein structure, function, conformation, and dynamics; biomolecules; enzymes, DNA-RNA; structure and flow of genetic information; biological membranes, and metabolism.

**Pre-/Co-requisites:** CHEM 342, Organic Chemistry II, is required as a pre-requisite for this course but may be waived with instructor approval with exigent circumstances.

CHEM 360L, Elements of Biochemistry Lab, is a recommended co-requisite for this course. The lab will build on class discussion and provide opportunities to apply and observe topics under discussion.

### Course Objectives

The goals of the MSU Science program are to present current information on aspects of the physical world and to develop logical reasoning, sometimes mathematical, relating one process to another.

Students who have completed this course should be able to (as aligned to Composite Science Education Program Approval Standards through North Dakota's Education Standards and Practices Board):

- Compare and contrast the major classes of biomolecules and their monomers.

- Discuss structure/function relationships.
- Discuss proteins as information processing molecules.
- Discuss the replication, transcription, and translation processes.
- Discuss the applications of biochemistry in biotechnology and medicine.
- Discuss the transformation of energy within a cell/organism.

**Standards Alignment** (Composite Science Education Program Approval Standards-ND ESPB):

- 13047.1 Composite Science Major/General Science The composite/general science program requires that environmental science be incorporated within other courses or as a separate course. The composite/general science program requires:1. Coursework in biology, chemistry, physics, and earth science, including: a. Minimum of twenty four semester hours in one area, b. Minimum of twelve semester hours in two other areas, c. Minimum of four semester hours in the fourth area, d. Courses must be from those that the institution allows toward graduation in the science major. 2. Study of mathematics through the pre-calculus level (college algebra and above) and statistics
- 13047.3 Inquiry The program requires study of the processes of science common to all scientific fields.

## Course Expectations

Material will be presented in class using PowerPoint which will also be posted on Bb and may be amended during class discussion with additional information. Links to videos we will watch are included in the PowerPoint. The presentation is provided as a tool.

## Instructor/Student Communication

Students are accountable for all academic communications sent to their Mayville State University e-mail address and all information posted on the course Blackboard site.

Assignments can be submitted electronically via email or using the appropriate drop box posted in the course shell. Electronic submissions must be readable whatever the format.

I will respond to all emails sent Monday – Friday within 24 hours. Weekend emails will be addressed the first day of the next work week, typically by noon.

### Assignments and Assessments

Assignments, quizzes, and exams will typically be distributed on paper in class for completion,

## Evaluation and Grading

Student grades will be based upon your performances in the following areas:

1. There will be problem assignments for each Block that involve the material being discussed in class. Complete assignments in a timely fashion. Late work is unacceptable and will be graded accordingly.
2. There will be at least 4quizzes (one in each Block), which cover the lecture material under discussion. The quizzes are given to ensure that you are keeping up with the reading and more importantly that you understand what we are discussing. The quizzes may be administered

electronically or physically in class. If electronically they will be available on the Blackboard class site. The quizzes are to check your understanding of the material.

3. There will be four exams during the semester administered after we complete a block of material. These assessments will be designed to address your understanding of the material presented in the text and in class. The exams will generally consist of a section of multiple-choice questions, a section of essay questions and problem-type questions where you will be required to apply and synthesize the material that has been presented and discussed in class. The Final Exam on Block 4 will be during the set final exam week, May 5 – May 9. This semester the date is Thursday, May 8. Most exams will have a "take home" component.

I will normally return assignments within 72 hours of the due date providing everyone has submitted. Graded electronic assignments, either submitted via a drop box or email, will be returned electronically within 72 hours as well. Oral feedback will be issued during class as appropriate. If someone is not participating or not taking care of business, I may ask you to join me for a personal conference outside of class time.

### Grading Policies

The final grade will be weighted using the following categories: assignments (at least one for each block 4 – 6), quizzes (one in each block 4), exams (one in each block 4), and participation.

### Attendance/Participation Policies

Actively participate in the learning process. To participate you need to be prepared so that you can ask and answer questions, draw your own conclusions, and think creatively as well as critically. If you do not understand something, speak out. Read the textbook as assigned!

Participate in course discussions and group activities.
Your participation in class will be monitored, evaluated, and included as part of your final grade. Participation includes asking and answering questions, working on assignments, etc. By default – attendance will be monitored; unapproved absences will affect your participation score.

### Grading Scale

Assignments 20%
Participation 15%
Quizzes 25%
Exams 40%

### Breakdown of Grades

A > 90, B > 80, C > 70, D > 60

## Enrollment Verification

The U.S. Department of Education requires instructors to conduct an activity which will validate student enrollment in this course. Class attendance will be used to verify enrollment in on-campus courses. If you do not attend, your enrollment in this course will be at risk.

## Important Student Information

In the Announcements section of the Blackboard Institution Page, you can view and download the Important Student Information document for the current academic year. It includes information about:

- ✓ Land Acknowledgement Statement
- ✓ Academic Grievance Concerns and Instructor English Proficiency
- ✓ NetTutor - Online Tutoring Program
- ✓ Starfish - Student Success System
- ✓ Students with Documented Disabilities
- ✓ Student Learning Outcomes / Essential Learning Outcomes
- ✓ Academic Honesty
- ✓ Emergency Notification
- ✓ Continuity of Academic Instruction for a Pandemic or Emergency
- ✓ Family Educational Rights and Privacy Act of 1974 (FERPA)
- ✓ Diversity Statement (Title IX)

## Course Timeline/Schedule

Course Timeline and Schedule are subject to change as deemed necessary by the instructor. Specific activities and due dates are posted on the class Bb website.

Block 1 (Weeks 1 – 3)
Introduction to Biochemistry and review/reminder of chemical principles from general chemistry and organic chemistry

Block 2 (Weeks 4 – 8)
Amino acids, Proteins, Enzyme kinetics

Block 3 (Weeks 9 – 13)
Lipids, Carbohydrates, Membranes, Cellular Respiration

Block 4 (Weeks 14 – 16)
Nucleic Acids, replication, transcription, translation

## Continuity of Academic Instruction for a Pandemic or Emergency

The health and safety of our students, staff, and faculty is our top priority. Mayville State University is committed to continuing face-to-face instruction for on campus courses each semester while minimizing exposure risk and promoting health and safety for students, faculty, and staff.

If there is a significant health or safety event that necessitates a change in course format, plans for remote options for this course include continuing online in an asynchronous manner.