BIOL 150: General Biology I

Fall 2025

3 Semester Hours

Course and Instructor Information

Instructor Name: Khwaja Hossain, PhD

Contact Information: Office Room: Classroom 110; k.hossain@mayvillestate.edu; Phone: (701) 788-4728

Hours of Availability: F: 2:00 – 3:30 PM or by appointment

Instruction Mode: On-Campus Face to Face

Course Dates: August 25 - December 19, 2025

Time Zone: All times indicated throughout this syllabus reflect Central Standard Time (CST)

Meeting Time and Location: MWF 1:00-1:50; Berg Hall, Rm 122

How to address your instructor- Khwaja

Learning Management System: Blackboard Ultra

Zoom Link: https://mayvillestate.zoom.us/j/88563312420

Course Description

Selected principles of biology with emphasis on processes, including cell structure and chemistry, cellular respiration, photosynthesis, homeostasis, genetics, and protein synthesis. The major philosophies and histories of science will be discussed, along with the interrelationships among the sciences. **Co-requisite:** BIOL 150L **Recommended**

Course Objectives

Through various instructional strategies and learning experiences (see below), the following outcomes are expected to be met by the learner after completion of this course(as aligned to Composite Science Education Program Approval Standards through North Dakota's Education Standards and Practices Board):

- The learner will be able to describe the biological structure and function of the cell and the molecules that make it up.
- The learner will be able to illustrate energy flow in living systems.
- The learner will be able to describe the processes and importance of cell division and meiosis and be able to distinguish between the two.
- The learner will be able to identify the link between DNA, RNA, and protein and describe processes of transcription and translation.

Biology aims to deepen your understanding of the scientific method of inquiry and expand your knowledge of living things and what they need to sustain life. We will explore organic structures, the processes that regulate life functions, the effects of living and non-living factors on biological systems, and how organisms have changed over time.

Teacher Education courses are based upon the Conceptual Framework: Reflective Experiential Teacher. See the document 'Conceptual Framework' provided in the course shell.

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.

Essential Studies Program Student Learning Outcomes Covered in This Course

This course is an institutionally certified general education course and contains assessment activities that align with LEAP Essential Learning Outcomes:

ELO #1: Students will demonstrate knowledge of human cultures and the physical and natural world through study in the sciences and mathematics, social sciences, humanities, histories, languages, and the arts. This is focused on engagement with big questions, both contemporary and enduring.

ELO #2: Students will demonstrate intellectual and practical skills, practiced extensively across the curriculum, in the context of progressively more challenging problems, projects, and standards for performance.

ELO #3: Students will demonstrate personal and social responsibility, anchored through active involvement with diverse communities and real-world challenges.

ELO #4: Students will demonstrate integrative and applied learning, including synthesis and advanced accomplishment across general and specialized studies. This is demonstrated through the application of knowledge, skills, and responsibilities to new settings and complex problems.

INTASC Principles

The following INTASC Principles are reflected in the readings and activities related to this course:

1	The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he/she teaches and can create learning experiences that make these aspects of subject matter meaningful for the students.
2	The teacher uses knowledge of effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom.
3	The teacher understands and uses formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social, and physical development of the learner.
4	The teacher is a reflective practitioner who continually evaluates the effects of his/her choices and actions on others (students, parents, and other professionals in the learning community) and who actively seeks out opportunities to grow professionally.

Essential Studies

As part of Mayville State University's Essential Studies curriculum, this course seeks to prepare students for twenty-first-century challenges by gaining: 1) Knowledge of human cultures; 2) Intellectual and practical skills; 3) Personal and social responsibility; 4) Integrative and applied learning.

Topics or Chapters

- Chapter 1. The Science of Biology
- Chapter 2. The Chemical Foundation of Life

- Chapter 3. Biological Macromolecules
- Chapter 4. Cell Structure
- Chapter 5. Structure and Function of Plasma Membranes
- Chapter 6. Metabolism
- Chapter 7. Cellular Respiration
- Chapter 8. Photosynthesis
- Chapter 10. Cell Reproduction
- Chapter 11. Meiosis and Sexual Reproduction

Course Materials & Technology

Almost all Mayville State University courses will require the use of a computer to review, complete, and submit assignments, perform research, run required software packages, communicate with instructors and other class members, etc. It is each student's responsibility to ensure that they have a compatible laptop when coming to campus for in-person courses. All students will receive licensing for the Microsoft Office suite of products, which includes Word, Excel, and PowerPoint.

The preferred laptop at Mayville State runs the Microsoft Windows operating system. The following chart notes the minimum requirements for a Windows-based laptop.

Windows PC (Preferred)	
Operating System	Microsoft Windows 11
Processor	Intel Core i5 or AMD Ryzen 5 (Intel Core i7 or AMD Ryzen 7 preferred)
Memory	8 GB RAM (16 GB RAM preferred)
Storage	256 GB solid-state drive (512 GB solid state drive preferred)
Browser	Up-to-date versions of Chrome, Edge, or Firefox

In addition to the above requirements, laptops should also have wireless network capabilities, a webcam, speakers, a microphone, and an HDMI or USB-C video output port.

Apple MacBooks may be used in place of a Windows-based laptop. However, it should be noted that required online applications, software packages, or hardware devices may not function correctly or be compatible with macOS-based laptops. Certain courses may require the purchase of additional software for Mac users.

Additional Requirements	
On-Campus Courses	**Laptop or tablet** computer with an integrated **front-facing webcam**, **HDMI** output, **speakers**, and a **microphone**
Distance Courses	Computer with **Webcam** and **headset with a microphone**. Minimum 5 Mbps internet speed recommended.

Required Text: Biology 2e from OpenStax, www.openstax.org/details/books/biology-2e

You will occasionally be using your computers during class.

Course materials, including PowerPoint presentations and corresponding audio lectures, will be available for each chapter in the Blackboard course shell. For each of the chapters, there will be a review for the chapter exam and quizzes, and you will be preparing yourself thoroughly based on the review before the exam. These resources will help you understand the content of the chapters, and you will have the opportunity to participate online.

Lectures –Lectures and reading materials for each chapter will be available on BlackBoard before classes in a regular fashion. It is expected that you will read each of the lectures at the start of each chapter and keep notes of the portion of the lecture you need to understand more **before** coming to class.

Lecture Quizzes – Expect in-class quizzes at the start or middle of some chapters to assess understanding of the lectures. The quizzes will be scored and contribute to the final grade, and in some cases, you will be allowed to use your note outlines to complete the quiz. All quizzes will be worth 10 points each.

In-Class Activities – Each day the class meets, we will engage in activities related to the current topic. These activities help you interact with the content and understand the concepts of each chapter. You will be asked questions based on the previous day's lecture or towards the end of the class. If time allows, students may participate in a flipped classroom where they teach part of the class on their chosen topic.

Exams – Exams will follow the chapters; in some cases, one exam will cover more than one chapter. All exams are worth 50 points each.

Use of Artificial Intelligence (AI)

MaSU does not have a policy specifically dedicated to generating AI tools. Any use or misuse of these tools is subject to the Academic Integrity Policy M540.1. You may use AI programs, such as ChatGPT, to help generate ideas and facilitate brainstorming. However, you should note that the material generated by these programs may be inaccurate, incomplete, or otherwise problematic. Beware that use may also stifle your independent thinking and creativity. You cannot submit any work generated by an AI program as your own. If you include material generated by an AI program, it should be cited like any other reference material (with due consideration for the quality of the reference, which may be poor). Any plagiarism or other form of cheating will be dealt with severely under the relevant MaSU policies.

Course Expectation

As a student of BIOL 150, I expect that you

- Fully review the course syllabus and go through it. If you have questions, ask the instructor.
- Effectively interact with your instructor as required.
- Exercise academic honesty while completing all quizzes and exams.
- If you know you will be absent from class, please send your instructor an email so that he is aware of it beforehand.
- Make sure that you are not late for the class. In case you are late for any unavoidable situation, only five minutes after the start of the class, you will be allowed to enter.
- **Please occasionally look at your grade and contact your supervisor if you are missing anything**

Instructor/Student Communication

The best way of contact is by email. There will be emails and Blackboard Announcements whenever necessary regarding the course. If a student chooses to call, it would be preferable to call the office number and expect to leave a detailed message; the instructor will get back to the student as soon as possible. If there is an email during the nights and weekends, the instructor will respond within 48 hours of receipt.

As the instructor of BIOL 150, you should expect me to

- inform you of what you should do to prepare for each class.
- create a class environment that is worth coming to each day.
- provide a safe environment for discussions and activities in which everyone feels comfortable sharing their thoughts and perspectives.

- and fairly grade quizzes and exams, providing useful feedback promptly.

Method of Evaluation/Grading

The grading system for students adding this course after the first day of instruction will be modified. The student will be graded only on the activities that transpired while the student is enrolled. Students will not be penalized for missed assignments, but they are still responsible for learning the course material that was covered during their initial absence.

Quizzes and Exams

Student grades will be based on your performance in the following areas:

1. You must complete quizzes to increase your proficiency in the chapter.
2. There will be exams for each chapter as scheduled in the syllabus.
3. Each exam is worth 50 points, and Quizzes/Video Quizzes are worth 10 points each.
4. There will be two assignments, each worth 50 points
5. Exam grades will be available in the gradebook.

The grading activities presented here may vary depending on the chapter and classes we will be able to cover.

Activity	No. of Occurrences	Points Possible	Percent of Total Grade
Exams	8	400	64%
Quiz	8	80	13%
Video Quiz	5	50	8%
Assignments	2	100	15%
Total Points Possible		630	

Grading Scale & Breakdown of Grades

Total points possible = 580

- 8 Exams = 50 points each for a total of 400 points: 64% of final grade
- Quizzes = 10 points each: 13% of final grade
- Video Quizzes 10 points each: 8% of total grade
- Assignments = 100 points: 15% of final grade

Letter Grade	Total Points	Total Percent
A	567-630 points	90-100%
B	504-567 points	80-89%
C	441-504 points	70-79%
D	378-4441 points	60-69%
F	Less than 378 points	Less than 60%

*Total points will be carried out to the tenth-place value and rounded up to the nearest whole number for the final grade (≥5 is rounded up).

*Incompletes for the class will only be given if an arrangement has been made with the instructor before final grades are submitted.

Enrollment Verification

On-Campus Course Statement

The U.S. Department of Education requires instructors to conduct an activity that 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.

Proctor Notification

No proctors are required for this course.

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: 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)

Additional Information

This classroom is a place where you will be treated with mutual respect, and the course instructor welcomes individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, abilities, and other visible or non-visible differences. All members of this class are expected to contribute to a respectful, welcoming, and inclusive environment for every other member of the class. MSU is committed to providing a safe learning environment, free of harassment and discrimination, as articulated in our university policies located on our website. MSU's policies require me as a faculty member to share information about incidents of gender-based discrimination and harassment with MSU's Title IX coordinator, regardless of whether the incidents are stated to me in person or shared by students as part of their coursework.

Week #	Assignments (draft)
Week 1-2 Aug. 25 – Sept. 5	**Chapter 1. The Science of Biology** **Due: Quiz Friday 9/5 and Exam Monday 9/8 by 1:50 pm** 1. **Read**: Chapter 1 PowerPoint and Study Guide

	2. **Watch** Video: Chapter I Lecture (30:01) and Characteristics of Life 3. **Review**: Chapter 1 Exam Review 4. **Submit**: Quiz 1 and Exam 1 **Note**: The Quiz and exam will open on Friday (09/5) at 1 PM and close on Monday (09/8) at 1:50 PM. You will be given 30 minutes for the quiz and 50 minutes for the exam. You are allowed two attempts, and the highest score will be kept as your grade.
Week 3-4 Sept. 8- 19	**Chapter 2. The Chemical Foundation of Life** **Due: Quiz- Friday 9/19; Exam-Monday 9/22 by 1:55 pm** 1. **Read**: Chapter 2 PowerPoint 2. **Watch**: Video: Lecture (41:05), 3. **Watch**: Elements, atoms, molecules, and compounds 4. **Review**: Chapter 2 Exam Review 5. **Submit**: Quiz 2 and Exam 2 **Note**: Exam and Quiz will open on Friday (9/19) and close on Monday (9/22) at 1:50 PM. You will be given 30 minutes for the quiz and 50 minutes for the exam. You are allowed two attempts, and the highest score will be kept as your grade.
Week 5-6 Sept. 22 –Oct. 3	**Chapter 3. Biological Macromolecules** **Due: Quiz- Friday 10/3; Exam- 10/6 by 1:50 pm** 1. **Read**: Chapter 3 PowerPoint 2. **Watch**: Video: Chapter 3 Lecture (31:38) 3. **Review**: Chapter 3 Exam Review 4. **Submit**: Quiz 3 and Exam 3 **Note**: Exam and Quiz will open on Friday (10/3) and close on Monday (10/6) at 1:50 PM. You will be given 30 minutes for the quiz and 50 minutes for the exam. You are allowed two attempts, and the Highest score will be kept as your grade.
Week 7-8 Oct. 6-17	**CHAPTER 4: Cell Structure** **Due: Quiz- Friday 10/19; Exam 10/20 by 1:50 pm** 1. **Read**: Chapter 4 PowerPoint 2. **Watch**: Video: Chapter 4 Lecture (42:34) 3. **Review**: Chapter 4 Exam Review 4. **Submit**: Quiz 4 and Exam 4 **Note**: Exam and Quiz will open on Friday (10/17) and close on Monday (10/20) at 1:50 PM. You will be given 30 minutes for the quiz and 50 minutes for the exam. You are allowed two attempts, and the Highest score will be kept as your grade.

Week 9-10 Oct. 20–31	**Chapter 5: Structure and Function of Plasma Membranes** **Due: Quiz- Friday, 10/31; Exam- Monday 11/3 by 1:50 pm** 1. **Read**: Chapter 5 PowerPoint and Study Guide 2. **Watch**: Video lecture 3. **Review**: Chapter 5 Exam Review 4. **Submit**: Quiz 5 & Exam 5 **Note**: Exam and Quiz will open on Friday (10/31) and close on Monday (11/3) at 1:50 PM. You will be given 30 minutes for the quiz and 50 minutes for the exam. You are allowed two attempts, and the Highest score will be kept as your grade.
Week 11-12 Nov. 03 – 14	**Chapter 7. Cellular Respiration** **Due: Quiz- Friday, 11/14; Exam-Monday 11/17 by 1:50 pm** 1. **Read**: Chapter 7 PowerPoint 2. **Watch**: Video: Chapter 7 Lecture (47:09), 3. **Review**: Chapter 7 Review 4. **Submit:** Quiz 6 & Exam 6 **Note**: Exam and Quiz will open on Friday (10/14) and close on Monday, 10/17, at 1:50 PM. You will be given 30 minutes for the quiz and 50 minutes for the exam. You are allowed two attempts, and the Highest score will be kept as your grade.
Week 13-15 Nov. 17– Dec. 5 **Nov. 27-29 Thanksgiving**	**Chapter 8. Photosynthesis** **Due: Quiz- Friday, 12/5; Exam- Monday 12/8 by 11:55 pm** 1. **Read**: Chapter 8 PowerPoint 2. **Watch**: Video: Chapter 8 Lecture (37:49), 3. **Watch:** Video: Alteration of Chromosome Number (7:59) 4. **Review**: Chapter 8 Exam Review and Practice Test 5. **Submit**: Quiz 7 6. **Submit**: Exam 7 **Note**: Exam and Quiz will open on Friday (12/5) and close on Monday (12/8) at 1:50 PM. You will be given 30 minutes for the quiz and 50 minutes for the exam. You are allowed two attempts, and the Highest score will be kept as your grade.

Week 16-17 Dec. 8-19	**Chapter 10/11:** Cell Reproduction & Sexual Reproduction **Due: Follow the Final exam schedule** 1. **Read**: Chapters 10 PowerPoints 2. **Review**: 10 Exam Review 3. **Submit**: Quiz 8 and 8 Final **Note**: Exam and Quiz will open on Friday (12/12) and close on the Final exam day at the assigned time. You will be given 30 minutes for the quiz and 90 minutes for the exam. You are allowed two attempts, and the Highest score will be kept as your grade.

THIS IS A TENTATIVE SCHEDULE. IT MAY CHANGE AS REQUIRED

	Assignments **Due: Assignment: Assignment on Biological Molecules in our Cells** **Please submit by Monday, 12/11 by 11:55 pm** 1. Go through the related chapters and PPTs to understand the topics of the assignment and problem solving and prepare your thoughts. 2. Complete the assignments and submit
Grades are due at noon on 12/23	

*** Course schedule is subject to change as needed**