BIOL 150L: General Biology lab

Fall 2025

1 Semester Hours

Course and Instructor Information

Instructor: Khwaja Hossain, PhD

Contact Information: Office Room#: Classroom Building 110; Email: 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 Date: August 25- December 19.

Time Zone: All times indicated throughout this syllabus reflect Central Standard Time (CST)
How to address your instructor- Khwaja
Meeting Time and Location: Tu 10:00-11:50 AM; Science 132
Zoom Link: https://mayvillestate.zoom.us/j/94405446400

Course Description

Laboratory exercises designed to explore proper lab technique, cell structure and chemistry, cellular respiration, photosynthesis, homeostasis, genetics, and protein synthesis. **Co-requisite:** BIOL 150

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 the flow of energy 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.

The purpose of the biology lab is to deepen your understanding of the scientific method of inquiry and expand your knowledge of living things and what they need to sustain life through experimental observations. We will use various laboratory investigations to explore organic structures, the processes that regulate life functions, the effects of living and nonliving 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.

Course Materials & Technology

No Text is required for this lab course. Laboratory procedures are available in the course shell; either download them or take a printout before the lab. Work on the lab in class and upload it before the following week's lab.

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.

Instructional Strategies

- Laboratory Activities
- Lab Notebook

Laboratory Activities - All lab handouts explaining lab activities will be posted on to Blackboard course shell in advance, so be sure to check BlackBoard in advance. Please review the lab handout so that you are prepared for the lab right when we start.

Lab Notebook – To save paper, you will work in the laboratory handouts as your laboratory notebook. Each week, you will record your laboratory investigations in your lab notebook. Each recording should have the following sections:

Complete activities for each lab, which will be worth 100 points. Incomplete lab notebooks will receive points based on the amount completed, up to 100 points.

Expectations/Protocols

Attendance is required and will be recorded.

As a student in this class, you are expected to:

1. Complete assignments in a timely fashion.
2. Actively participate in the learning process. To participate, you need to be prepared so that you can ask and answer questions, draw your conclusions, and think creatively as well as critically. If you do not understand something, speak out.
3. Take responsibility for the learning experience of yourself and the other members of the class. You can learn a great deal by working with others.
4. Attend all class meetings. In-class attendance will be recorded each time the lab meets. Absences hurt your learning experience and that of everyone else in the class. If you miss a class with a university-approved excuse, you will be allowed to make up any missed work. Being busy, oversleeping, taking an extra shift, or having general issues are NOT considered university-excused absences. Please do not ask for extensions based on these reasons. If a university-approved absence is granted with documentation, the student has 1 (one) week to complete the missed work. This one-week period starts from the due date, NOT from when the student returns or contacts the instructor. After one week, no points will be awarded. A university-approved absence is based on reasons such as illness with medical documentation, participation in an official university sporting event (with documentation), death in the immediate family (grandparent, parent, sibling, child, aunt/uncle with documentation), military deployment (with documentation), or legal matters like a court date (with documentation). Moving or traveling unrelated to university activities does NOT qualify as a university-excused absence. Any academic accommodation for these or similar reasons must be approved by the responsible authority.

As a student, you are expected to:

- Begin the lab course when the semester begins.
- Answer questions appropriately: Some lab report answers may be given without full sentence structure where appropriate to the questions asked, but must answer all parts of the question, contain correct spelling, and display appropriate grammar and word usage. Answers to other questions, such as essay questions or short answer questions, which ask students to “explain”, “compare,” or “describe”, should display appropriate sentence structure and logical development of thought. **Every single answer needs to be put into your own words. Copying and pasting is plagiarism and will receive a score of ZERO**
- Check your Mayville State email and the ANNOUNCEMENTS forum on the course home page a minimum of once daily to remain current on course information and changes.
- **Please occasionally look at your grade in the grade book and contact your supervisor if you are missing anything.**
- **After the submission deadline, you will not see the lab on Blackboard. Please watch for it.**

The Following Topics will be covered in the lab

1. Water and Macromolecules
2. Microscopes and Cells
3. Cell Function
4. Diffusion and Osmosis
5. Enzymes

6. Cell Respiration
7. Photosynthesis
8. Mitosis & Meiosis
9. Human Genetics
10. DNA
11. Central Dogma of Biology

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.

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 the student is still responsible for learning the course material that was covered during their initial absence.

Lab activities

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

1. You need to complete and submit the lab following the deadlines.
2. Exam grades will be available in the gradebook.
3. Each lab and lab quiz is worth 100 points.

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
Lab	10	1000	83.4%
Quizzes	1	100	8.3%
Assignments	1	100	8.3%
Total Points Possible		1200	

Grading Scale & Breakdown of grades

Letter Grade	Total Points	Total Percent
A	1080-1200 points	90-100%
B	960-1079 points	80-89%
C	840-959 points	70-79%
D	720-849 points	60-69%

F	Less than 720 points	Less than 60%

*Total points will be carried out to the tenths 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.

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)

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 at http://www.mayvillestate.edu/about-msu/consumer-information/title-ix/. 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.

NOTE: This is a **tentative** schedule. It may change based on the instructor's schedule.

Labs	Date:
Week 1 & 2 – Introduction & Syllabus Review	8/25-9/5
Week 3 – Lab 1: Properties of Water	9/8-12
Week 4 – Lab 2: Microscope and Cell Lab	9/15-19

Week 5 & 6– Lab 3 & 4: Carbohydrate & Protein ID	9/22- 10/3
Week 7 – Lab 5: Microscope and Cell Function	10/6- 10
Week 8 – Lab 6: Diffusion & Osmosis	10/13- 17
Week 9– Lab 7: Osmolarity of Plant Cell	10/20-24
Week 10 – Lab 8: Lactose Enzyme Lab	10/27-31
Week 11 & 12- Lab 9: Photosynthesis & Cellular Respiration	11/03 - 14
Week 13 – Lab 10: Spinach Leaf Chromatography	11/17-21
Week 14 & 15– Mitosis in Plant and Animal Cells	11/24- 12/5
Week 16- Assignment: Concept & Understanding of Biology	12/8-12
Dec 15 -19 Final Week	