BIOL 341L: Cell & Molecular Biology Lab

Dr. Khwaja Hossain, PhD

Spring 2024

1 Semester Hour

Contact Information: Office – Classroom 110, Email – k.hossain@mayvillestate.edu, Phone:701-788-4728
How to Address Your Instructor: By Name, Khwaja
Hours of Availability: Fridays, 12:00-1:30 pm, or by appointment
Instruction Mode: online asynchronous
Time Zone (Online Courses): All times indicated throughout this syllabus reflect Central Time (CT).
https://mayvillestate.zoom.us/j/93492380743

Course Description

The lab content encompasses basic laboratory procedures in cell and tissue culture, chromosome staining and visualization, use of gel matrixes in separating and detecting nucleic acids and protein, and analysis of nucleic acids databases using different bioinformatics tools.

Co-Requisites: Enrollment in the corresponding lecture course, BIOL 341, is required.

Purpose of the course

This course is designed to make students proficient in applying techniques in analyzing cell structure and identifying cell components.

Course Objectives

The lab course is designed to help students grasp the fundamentals of Cell Biology from an online approach enhanced with technology. Objectives, as aligned to Composite Science Education Program Approval Standards through North Dakota's Education Standards and Practices Board (ND ESPB):

1) To understand the structure of prokaryotic and eukaryotic cells and differences between them
2) To learn the methods of manipulating nucleic acid and conversion of nucleic acid to mRNA and protein
3) To comprehend the biological macromolecules and techniques of their utilization

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

Required Materials

This course requires a lab kit purchased from the Mayville State University bookstore at www.mayvillestatebookstore.com or
Cell and Molecular Biology – Spring 2023 (SI-10249-BK-01 – BIOL 341L) from Hands-on labs.

Students are required to enroll using the Enrollment URL: https://myhol.holscience.com/enroll/hhfm-dxfk-czhz-knvp

There is the problem of integrating this course into the blackboard shell, whenever you complete the lab assignment, I may need to move the grade to the grade book on the blackboard.

Please contact customer care for any concerns-

Student Resource Center:

https://scienceinteractive.com/wp-content/themes/scienceinteractive/page-22570.php

Kit Contents/Inventory Check:

https://studenthelp.scienceinteractive.com/a/1284202-where-can-i-find-my-kit-contents-list

Course Expectations

Complete assignments in a timely fashion. Late work will be accepted only on pre-approval and will be deducted 5 points per day.

Consider spending sufficient time on the documents posted in this course, if you have any questions contact me. The best way to contact me is by email. I check my email regularly during regular working hours (M-F, 8:00am – 5:00pm). I seldom check my email during the nights and weekends, so my response may take a little longer during these periods. I will, however, try to respond to you within 48 hours of receiving your message. I will also be emailing you and posting to the Blackboard Announcement Forum whenever necessary. If you choose to call my office and I do not answer, please leave a detailed message and I will get back to you as soon as possible. Again, I do not check my office phone messages at night and over the weekend, so if you call during that time, I will not respond until the following workday.

Instructor/Student Communication

Students are accountable for all academic communications sent to their MSU email address.

If you have any questions, contact me. The best way to contact me is by email. I check my email regularly during regular working hours (M-F, 8:00am – 5:00pm) and will reply to you as soon as I can during those hours. I seldom check my email during the nights and weekends, so my response may take a little longer during those times. However, I will try to respond to you within 48 hours of receipt of your message. I will also be emailing you and posting to the Blackboard Announcement Forum whenever necessary either with announcements of assignments or other things. If you choose to call my office and I do not answer, please leave a detailed message and I will get back to you as soon as possible. Again, I do not check my office phone messages at night and over the weekend, so if you call during that time, I will not respond until the following workday.

Method of Evaluation/Grading

Assignments

The activities are laid out in a weekly fashion in the course schedule. I would like you to go through the corresponding lab in the online lab manual and familiarize yourself with the terms and descriptions before working on the exercises. ***You will not be allowed to complete lab assignments without completing Lab 1, 2 & 3.*** Read the directions provided for you for each lab and complete all of the sections.

In each lab, there are many different kinds of figures/images and you need to look at those carefully. You need to use all supporting resources such as figures, images, and tables for the answers wherever applicable.

Grading Scale

Letter Grade	Total Points	Total Percent
A	900-1000 points	90-100%
B	800-899 points	80-89%
C	700-799 points	70-79%
D	600-699 points	60-69%
F	Less than 600 points	Less than 60%

Grade Breakdown

Student grades will be based upon your performance in the lab assignments. You have 10 labs and each worth 100 points. You have total 10x 100= 1000 points.

Lab grades will be posted one week after they are taken, as for example, if you take a test on a Saturday you can expect grades will be posted the following Saturday.

Course Timeline/Schedule

This course will follow the following weekly outline:

Week #	Assignments (draft)
Week 1 Jan. 09- 13	**Enrollment Verification** **Due Saturday 1/12 by 11:55 pm** 1. Walk through the getting started section on the Blackboard 3. Post a self-introduction in the Introduction forum (Enrollment Verification) –DUE Jan 14, 2021 4. Enroll to the lab course using the Enrollment URL: https://myhol.holscience.com/enroll/hhfm-dxfk-czhz-knvp
Week 2 Jan. 15-19. Martin Luther King, Jr. Day no classes 1/15	**Lab 1 – Getting Started** **Due Saturday 1/20 by 11:55 pm** 1. Go through the lab background and instructions to obtain the necessary information. 2. Study the lab manual for Lab 1 in detail to understand the topic. 3. Complete the lab, answer lab questions, and submit a lab report
Week 3/4 Jan. 22– Feb. 2	**Lab 2- Laboratory Safety** **Due Saturday 2/3 by 11:55 pm** 1. Go through the lab background and instructions to obtain the necessary information. 2. Study the lab manual for Lab 2 in detail to understand the topic. 3. Complete the lab, answer lab questions, and submit the lab report
Week Feb. 5–Feb 9	**Lab 3- Using the V-Scope (Virtual Microscope)** **Due Saturday, 02/10 by 11:55 pm**

	1. Go through the lab background and instructions to obtain the necessary information. 2. Study the lab manual for Lab 3 in detail to understand the topic. 3. Complete the lab, answer lab questions, and submit the lab report
Week 6/7 Feb. 12- Feb. 23	Lab 4- Cell Types: Structure and Function Due Saturday 2/24 by 11:55 pm 1. Go through the lab background and instructions to obtain the necessary information. 2. Study the lab manual for Lab 4 in detail to understand the topic. 3. Complete the lab, answer lab questions, and submit lab report.
Week 8/9/10 Feb. 26 – Mar. 15	Lab 5: DNA, RNA, and Protein Synthesis Due Saturday, 03/9 by 11:55 pm 1. Go through the lab background and instructions to obtain the necessary information. 2. Study the lab manual for Lab 5 in detail to understand the topic. 3. Complete the lab, answer lab questions, and submit the lab report
Week 9 Mar. 4-10	Spring Break no class
Week 11 Mar. 18-Mar. 22	Lab 6: Biomolecular Techniques Due Saturday, 03/23 by 11:55 pm 1. Go through the lab background and instructions to obtain the necessary information. 2. Study the lab manual for Lab in detail to understand the topic. 3. Complete the lab, answer lab questions, and submit the lab report
Week 12 Mar. 25 – Mar. 29	Lab 7: Mitosis and Meiosis Due Saturday, 03/30 by 11:55 pm 1. Go through the lab background and instructions to obtain the necessary information. 2. Study the lab manual for Lab in detail to understand the topic. 3. Complete the lab, answer lab questions, and submit a lab report.
Week 13 Apr. 1 – Apr. 5	Lab 8- Biological Macromolecules Due Saturday, 04/6 by 11:55 pm 1. Go through the lab background and instructions to obtain the necessary information. 2. Follow the links and learn details about different identifying properties of minerals and rocks. 3. Complete the lab, answer lab questions, and submit the lab report.
Week 14 Apr. 8 –12	Lab 9: Population Genetics: Natural Selection and Hardy-Weinberg Equilibrium Due Saturday, 04/13 by 11:55 pm 1. Go through the lab background and instructions to obtain the necessary information. 2. Follow the links and learn details about different identifying properties of minerals and rocks. 3. Complete the lab, answer lab questions, and submit the lab report

Week 15/16 Apr. 15- 26	Lab 10: Glycolytic Pathway in Humans and analysis of genes involved in glycolysis. Due Saturday 04/27 by 11:55 pm 1. Go through the lab background and instructions to obtain the necessary information. 2. Complete the assignment and submit
Week 17 Apr. 29- 3	Lab 11. Restriction Enzymes and Fragment Analysis Due Saturday 05/6 by 11:55 pm 1. Go through the lab background and instructions to obtain the necessary information. 2. Complete field trips answer Quizzes and submit
Week 18 May 6-10	Final Exam Week

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

Enrollment Verification

The U.S. Department of Education requires instructors of online courses to provide an activity which will validate student enrollment in this course. The only way to verify that a student has been in this course is if he or she takes an action in the LMS, such as completing an assignment or taking a quiz. Logging into the LMS is NOT considered active course participation. Please complete the designated enrollment verification activity by the date indicated. If it is not complete 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:

- ✓ 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)

Starfish – Student Success System

Starfish is Mayville State's Student Success & Early Alert System the faculty and staff use to report feedback on your academic performance, attendance, etc. If you receive a Starfish notification (will be

sent to your @mayvillestate.edu email from the Student Success Center), please read it immediately – it will contain important information for you.

We Care About Your Success

Throughout the term, you may receive emails from Starfish® regarding your course grades or academic performance. Please pay attention to these emails and consider taking the recommended actions. They are sent to help you be successful! You will also have the ability to reach out for help by "Raising your hand" in Starfish and choosing between the "I Have a Question" flag and the "I Need Help" flag. After the flag has been raised the appropriate faculty or staff will make contact to see how they can assist you.

Once again, we are here to help you be successful!

In addition, your instructor may: (1) request that you schedule an appointment by going to Starfish, or (2) recommend that you contact a specific campus resource, such as tutoring or counseling. You may also be contacted directly by one of these services.

So be sure to log in to Starfish AND check your MSU email inbox on a regular basis. This is where you'll be notified about your academic progress throughout the semester. If you have any questions, you can visit the Starfish webpage on MSU's site found in the "Current Students" tab and under the "Academic Information" list.

NetTutor - Online Tutoring Program

NetTutor is a free, online tutoring service that provides one-on-one virtual tutoring sessions with a professional tutor, as well as a Question Center which allows students to privately post a question and receive a personalized answer within 24-hours in a variety of subjects. NetTutor does not require you to schedule an appointment, you can just "drop in" online for a live, one-on-one tutoring session. NetTutor helps students progress in the classroom and beyond!

Students with Documented Disabilities

You have the right to be accommodated if you are a student with a documented disability. Visit the Student Success Center, or contact them at studentsuccess@mayvillestate.edu, to design a solution that will help you succeed.

As required by Section 504 of the Rehabilitation Act and the ADA, appropriate and reasonable accommodations will be made for all students with documented disabilities (LD, Orthopedic, Hearing, Visual, Speech, Psychological, ADD/ADHD, Health-Related, and other) who request those accommodations to ensure full access to the academic opportunities of Mayville State University. To receive services, students must disclose their disabilities, request accommodations, and provide documentation showing necessary accommodation to the Director of Student Success and Disability Support Services. Any information shared will remain confidential.

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, ability – 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.