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BIOB 226N.00: General Science: The Biology and Chemistry of Life - Laboratory

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Laboratory Syllabus BIOB 226-01: Life and Chemical Sciences

Spring 2022

Lab Time: Tuesday and Thursday 1:00 – 2:50 PM

Lab Location: NS 207

Office Hours: By appointment

Teaching Assistant:

Office Location:

E-mail:

Laboratory Course Content

BIOB 226 lab exercises are designed to accomplish 3 primary objectives: a) help you understand more completely, and in an on-hands fashion, fundamental principles of the Life and Chemical Sciences, b) cultivate your self-directed, inquisitive and experiment-based learning abilities, and c) experience a collaborative and communication-based learning/work environment. In most cases, the lab exercises will overlap completely with the lecture material. However, sometimes labs will parallel or expand further on lecture topics. In both cases, the introductory lecture at the start of each week's lab will provide you with necessary background information.

Learning Outcomes

At the end of the course, students will be able to:

1. Demonstrate an understanding of the scientific method and be skilled in problem solving, critical thinking and analytical reasoning as applied to scientific problems.
2. Design and carry out scientific experiments, accurately record and analyze the results of such experiments, and clearly communicate the results of scientific work.
3. Proper laboratory safety and techniques
4. Understand the metric systems and unit conversions
5. Understand the fundamental properties of atoms, molecules, various states of matter, and its influence on chemical properties.
6. Understand the chemical and thermodynamic properties of biological molecules.
7. Demonstrate a fundamental understanding of the structure and function of cells.
8. Understand basic metabolic processes and the flow of energy in biological systems.
9. Understand the process of evolution and how it accounts for both the unity and diversity of life.
10. Discuss the interactions and relationships between the abiotic and biotic elements of the environment that influence the distribution and abundance organisms.

Required Materials

- **Lab handout:** these will be uploaded to the Moodle lab page each week. Please have a copy in hand (digital or print out) prior to the start of lab each week.
- **Lab notebook:** You will need a 3-ring binder, composition notebook, spiral notebook or sketchbook to keep your notes from each lab. These notes will help you study for your weekly quizzes, retain data for your lab writeups and help deepen your understanding of lab concepts. Keeping your lab notebook up-to-date is part of your participation grade. You may create a digital notebook but you are still responsible for dictating data/drawings from lab.

Student Expectations

- **Arrive on time for lab session:** Lab will start promptly each week and I expect you to be on time for face-to-face meetings. We will have one pre-lab quiz each week that you must complete prior to the start of lab. Quizzes will be via the lab section Moodle page and you will be given 10 minutes to

complete it in lab. If you need accommodations for lab work, please present me with your letter of accommodation as soon as possible.

- **Come to lab prepared:** This means reading over the week's lab beforehand. Starting the week of January 24th there will be a short quiz due at the start of each lab. Quiz content will pull heavily from the summary section of each week's lab handout.
- **Work collaboratively, write independently:** Work with your lab group to complete and better understand each week's lab. However, all assignments must be your own work or you will not receive credit for them. You will be working with the same partner every week.
- **Attend the full 2-hour session:** Quizzes will be followed by an introductory lecture. Concluding remarks, which are likely to appear on the next week's quiz, occur at the end of the 2-hour session. Additionally, lab clean-up and reorganization is required. Points will be deducted from your participation grade if your area is left messy.

COVID Policy

- For all face-to-face instruction, we will abide by state and university policies to reduce the risk and spread of COVID-19 which includes strict social distancing guidelines and wearing a mask. You are expected to wear a mask that FULLY covers your nose and mouth at all times when in the building. I will enforce this very strictly and no exceptions will be made. The University policy can be found here: <https://www.umt.edu/coronavirus/mask-policy.php> <https://www.umt.edu/coronavirus/healthy-fall-2020/health-safety-guidance/default.php>
- If you feel sick and/or are exhibiting COVID-19 symptoms, please don't come to class and contact the Curry Health Center at (406) 243-4330.
- If you are required to isolate or quarantine, you will receive support in the class to ensure continued academic progress. Inform me about your situation as soon as possible and we will try to make sure you can complete your lab remotely.
- Class attendance and seating will be recorded to support contact tracing efforts. • Drinking liquids and eating food is discouraged within the laboratory.

Grading

Your grade in the laboratory section of BIOB 226 will make up approximately 50% of your total course grade. You will have 550 points possible from the lab section. Points are broken down by assignment in the table below.

Type of Assignment	How Many in the Semester	Points Each is Worth	Total Points for that Type of Assignment
Quizzes	11 (one dropped)	15	150
Scientific Lab Report	3 (one practice)	50 (25)	125
Primary School Presentation	1	75	75
Lab Notebook	2x	50	100
Lab Participation and Clean Up	10	10	100
Total Points Possible for Lab:			550

- **Quizzes:** Quizzes will be handed out at the start of class. They are ten minutes long. They will start the week of January 27th. The material covered will be ~70% about the previous week's lab, and ~30% about the current week's lab.

- **Lab Reports:** You will have to complete three scientific lab report. The first lab report will be a practice report written on the “What’s so special about water?” lab. The second report will be completed on your self-designed experiment in the “Scientific Method” Lab. The third lab report can be written on either the “Photosynthesis” or “Digestion and Respiration” labs. Lab reports will be turned in on the Moodle page for your lab section.
- **Primary School Science Projects and Presentations:** Throughout the semester, you will work with a partner to create a science activity that can be adopted into a primary school science classroom curriculum to enhance science education and awareness in our schools. We hope to compile these activities into a Montana specific science education guide. This document will contain a set of suggestions concerning selected concepts and activities and use low-cost materials or equipment, which can be modified, adapted, and enriched according to the needs of the students and individual schools. This curriculum guide will outline the Montana Science Content Standards to assist teachers in developing high quality science curriculum and activities. You will present your primary school science project to your lab section near the end of the semester. You will be graded on your preparation, delivery, and grasp of the concepts presented.
- **Lab Notebook:** Lab notebooks will be checked periodically during the semester. I will check off your notebook prior to the end of lab. For digital content, you will need to upload your lab notebook to Moodle each week. Please order your notebooks chronologically (i.e., in the order we go through activities over time) and include a Table of Contents in the beginning of your notebook. Each week you should have a lab entry with the appropriate sections as outlined in our first lab handout.
- **Lab Participation and Clean Up:** You can think of these points as a grade buffer. To get them all you have to do is show up to lab on time, be respectful of the (often expensive!) lab materials while in lab, participate fully in the lab experiments, maintain your lab notebook, and clean up your supplies at the end of lab. You will be responsible for disinfecting your station upon arrival and departure. This is very important and points will be lost if you do not fully and properly clean all materials.

Policy for Late Assignments or Missed Labs

If you know that you will miss a lab, please let me AND the TA of the “make-up” lab section know as soon as possible. While you can attend another lab section to make up a lab you miss, we cannot have too many students attend another section due to the need to maintain social distancing. Unannounced “walk-ins” to alternative lab sections will be denied. If you arrive late to lab or are absent, you will lose participation points unless you have a documented excuse for that absence. Lab reports and research papers turned in late are - 5% per day. The primary school presentations should not be late, as rescheduling your presentation for a different time will not be possible.

Statement on Academic Honesty and Plagiarism

Quizzes must be completed independently, or you will not receive credit for them. All turned in assignments (i.e lab reports) must be written independently, or you will not receive credit for them. Please DO work with your lab mates to complete the labs in class. Teamwork is necessary for the completion of these labs in the allotted time. However, you cannot WRITE your lab with your lab mates. You may discuss the concepts together, but if sections of the written lab reports are the same, you will not receive credit for that lab report. Turning in the same written concept is known as PLAGIARISM, and it can get you discredited from the scientific community. All intentional acts of plagiarism will be reported to the University of Montana.

Extra Credit

Extra credit will be available on each week's quiz (1 point per week) and for turning in a rough draft of your first lab report to the University of Montana's writing center for editing (10 points). The edited draft must be signed by your writing tutor and attached to your final lab report. To make an appointment with the writing center see their website <http://www.umt.edu/writingcenter/default.php>

Accesibility Syllabus Statement

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and the Office for Disability Equity (ODE). If you anticipate or experience barriers based on disability, please contact the ODE at: (406) 243-2243, ode@umontana.edu, or visit www.umt.edu/disability for more information. Retroactive accommodation requests will not be honored, so please, do not delay. As your instructor, I will work with you and the ODE to implement an effective accommodation, and you are welcome to contact me privately if you wish.