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

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General Science: The Biology and Chemistry of Life (BIOB 226)

Spring Semester 2022

Professor: Dr. Annie Green

Email Address: annie.green@mso.umt.edu

Office: Health Science Bldg 210

Office hours: Wednesdays from 1-2 pm

Course hours and location

Lecture: Tuesday and Thursday 11-12:20 pm in ISB 110

Lab sections: (1) 1-2:50pm T TH; (2) 3-4:50pm T Th; (3) 10-11:50am WF

All lab sections will take place in HS204

Overview

Welcome to an introduction to the Biological and Chemical Sciences! This course is a one-semester, lecture/lab combination course exploring the principles and concepts of both biology and chemistry. Students will utilize scientific practices to discover and recognize unifying themes that integrate life and chemical mechanisms. On the chemical side, this course will provide an understanding of how chemical concepts relate to biological processes, how processes in living systems can easily be affected by their chemical environments, and the chemical structure and biological function of important macromolecules. On the biological side, we will explore the natural world by examining the organization and complexity of living organisms and the systems in which they live. We will elucidate the central questions of biology such as the relationship between form and function, acquisition and use of energy, and the continuity between generations.

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 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 their 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 of organisms.

COURSEWORK

- ***Lectures***

I have divided the course into 7 major units. For each unit, I will present 2-6 lectures during our scheduled lecture meeting time on Tuesdays and Thursdays. It is important to attend the lectures, come on time and stay for the entire lecture. In my experience, students who come to lecture regularly do better on all assignments than those who do not! Unannounced quizzes will be given during lectures. These quizzes will account for 5-10% of your final grade. I strongly recommend that you take notes during lectures, review lecture materials, and when complete further insights exercises. [Research shows that people perform better on conceptual tests when drawing and writing notes rather than typing the notes.](#) If you have never taken college-level notes before or want some advice, check out this [video describing five note-taking techniques](#) aimed at college students. One of these techniques may work for you.

- ***Labs***

Twice a week you will attend a laboratory section with exercises to supplement your learning and provide more hands-on exercises of the concepts we discuss in the lecture. You will meet your TA at the first lab meeting, which will start the second week of classes. Your lab TA will provide you with further information on requirements in the lab. Your TA will be an essential resource for this class and will be your first point of contact when you have questions about the course or difficult concepts. The labs are critically important to our grade because they make up more than 50% of the total points available. There is no way to pass this course without participating in the laboratory.

- ***Exams***

There will be five exams in total for this course. The lowest exam grade will be dropped. Each exam will consist of multiple-choice, true/false, short answers, and matching questions. Each unit exam will consist of approximately 40-60 questions. Your answers for all exams will be recorded on electronically graded Scantron forms (red narrow), which are available at the bookstore, library, or ThinkTank Café. On exam days, all you need to bring to class are #2 pencils, a Scantron form, and your student ID card.

Makeup exams are possible if you have a serious personal emergency. Only students presenting reasonable documentation as to why they could not attend the regularly scheduled exam to Dr. Green at least 24 hours before the regularly scheduled exam will be eligible for a make-up exam. You will receive a zero for a missed, unexcused exam. Students with disabilities and applicable testing accommodations should contact Dr. Green to ensure appropriate accommodations are available. Make-up exams will be administered two weeks *after* the scheduled exam and are a different format than the regularly scheduled exam.

- ***Recommended Materials***

We will be using free online textbooks available through [OpenStax](#). We will utilize the [Concepts in Biology](#) textbook. I have provided the corresponding OpenStax chapters on the course schedule. We will be using the [Poll Everywhere](#) classroom polling system to make our

class time more engaging, and Moodle to record attendance. You are required to bring a device to participate in my Poll Everywhere sessions during class. The Poll Everywhere sessions and recording of your attendance will be counted toward your lecture participation points.

Attendance will be recorded at every lecture via Moodle by the student. The attendance function can be found at the top of the course Moodle page. A student is marked late if they record their attendance 15 minutes after the lecture has started. If a student forgets to record their attendance, they can contact the professor, but they will be marked late.

Many course units will include further insight videos or exercises. **Further insights (FI)** allow you to work through a biology problem step-by-step or hear a more detailed explanation of a concept taught in the lecture. These exercises are designed to help you develop your scientific problem-solving skills. I strongly recommend reviewing these videos/exercises.

- ***Participation***

General Science: Chemical and Life Sciences is a cumulative course, so your success in grasping the material presented one week will depend on your understanding of material presented in previous weeks. It is essential for you to keep up with the readings and assignments.

Furthermore, participation in the course is vital to your success in the course. Attendance in lecture will be recorded by you in Moodle and will contribute to your final grade in the course. Participation expectations include asking and answering questions in class, on the forum and interacting with peers inside and outside of the lecture hall about course material. Classroom polling will be facilitated through Poll Everywhere, and can be accessed through any mobile device. Learning is not a passive activity in BIOB 226 (and in all your coursework!) you need to take an active role. If you fall behind, please advise me as EARLY as possible. I will be better able to help you if you talk with me as problems arise; I will be less sympathetic right before an exam is due or near the end of the semester. If needed I am available to meet via online chat or in my office on the university campus. Please email me to schedule an appointment. I am here to facilitate your learning, but I ask that you:

- ✓ Actively participate in the course
- ✓ Work cooperatively to answer questions from colleagues
- ✓ Take responsibility for being prepared before completing coursework.
- ✓ Reflect objectively on your own progress and understanding

- ***Forums and “Office Hours”***

Office hours are held in the Health Science building room 210, or by Zoom. My office hours will be Wednesdays from 1-2 pm. Furthermore, I maintain an open-door policy with all of my students. If my door is open, please feel free to come on by to chat. If not, email me to set up an appointment. Additionally, there is a discussion forum at the top of the Moodle page, which students can use to post comments or questions about course material. I will read the posts and answer them if appropriate. I aim to provide answers within 24 hours.

- ***Grading***

Grades in this course will be assigned in the +/- system. Your grade will be based on the following:

5 Lecture Exams (75 pts each) [Lowest grade dropped]	300
Lecture Participation	150
Laboratory Participation	<u>550</u>
Total	1000 pts

COURSE POLICIES

- ***Make-up examinations***

Makeup exams are possible if you have a serious personal emergency. Only students presenting reasonable documentation as to why they could not attend the regularly scheduled exam to Dr. Green at least 24 hours before the regularly scheduled exam will be eligible for a make-up exam. You will receive a zero for a missed, unexcused exam. Students with disabilities and applicable testing accommodations should contact Dr. Green to ensure appropriate accommodations are available. Make-up exams will be administered two weeks *after* the scheduled exam and are a different format than the regularly scheduled exam.

There will be a penalty for late submission of work. **5%** will be subtracted each day for late assignments. I will take into account any **documented** extenuating circumstances. Try your utmost **NOT TO FALL BEHIND!** Please contact me as soon as possible to open any closed assignments for a late submission.

- ***Technical Requirements***

Students are expected to be familiar with computers, the Internet, Moodle, and Zoom. Students are responsible for their software and computer equipment maintenance and set up as recommended by the University of Montana (<http://www.umt.edu/it/default.php>). Students must have software capable of downloading and reading PDF files. If you are having any technical issues please contact the IT department at <http://www.umt.edu/it/support/default.php>.

IMPORTANT – you must understand how to operate Moodle. I have posted a Moodle tutorial to help anyone unfamiliar with the platform. This important orientation will require less than 1 hour of your time. You will earn a Moodle certificate as proof of your mastery.

- ***Adds, drops, and changes of grading***

University policies on drops, adds, changes of grade option, or changes to audit status will be enforced. These policies are described in the 2021-22 UM course catalog, <http://catalog.umt.edu/>. The last day to drop fall courses without the Dean's signature is 5:00 PM on Monday, March 28th. Thereafter, a DROP may be requested by petition, but the petition must be accompanied by documentation of extenuating circumstances.

- ***Cheating and Plagiarism***

Although I encourage students to work collaboratively with others, ***the work you hand in must be your own.*** A good rule of thumb is that you can work together up to the point of committing words to paper (or word processor). After that, the words you put down should be your own. We remind you of the official University policy on plagiarism: "Plagiarism is the representing of

another's work as one's own. It is a particularly intolerable offense in the academic community and is strictly forbidden. Students who plagiarize may fail the course and may be remanded to Academic Court for possible suspension or expulsion ([See Student Conduct Code section of this catalog](#)). Students must always be very careful to acknowledge any kind of borrowing that is included in their work. This means not only borrowed wording but also ideas. Acknowledgment of whatever is not one's original work is the proper and honest use of sources. Failure to acknowledge whatever is not one's original work is plagiarism." (Quotation from the University of Montana Catalog). If you have any questions about the line between collaboration and plagiarism, see your professor before you hand in the material. Assignments from two or more students that have significant overlap will be regarded as reflecting a violation of the expectation that students turn in independent work. All the students involved will be given no points for that material, and the violation will be dealt with according to the Student Conduct Code. Penalties for plagiarism and cheating can be as severe as suspension or expulsion from the university.

- ***Students with Disabilities***

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. If you would like to request reasonable accommodations, you are advised to provide your ODE verification letter to Dr. Green in the first week of class so appropriate arrangements can be made. If you decide after the semester begins to disclose your disability and request accommodations, you should provide documentation, if possible, at least 10 days before the upcoming assessment so I may prepare appropriately. It is the responsibility of students to make sure they understand the types of modifications available to them before assessments.

- ***Classroom Behavior***

If you choose to come to lecture, conduct yourself as a responsible, courteous adult. Students who are being disruptive in lectures by talking, sending or receiving messages, reading the newspaper, eating, or playing computer games/videos will be asked to leave the classroom. Such behaviors affect the learning of other students in the classroom and will not be tolerated. Re-admittance to class is at the discretion of the instructor. The second such offense will result in dismissal from BIOB 226 with a grade of F.

- ***A Note on Email and Spam Filters***

All email communication for the course will be sent to your official university email, and not to other email providers. If you don't normally check your university email you will miss important emails. You can have your university email forward messages to other email addresses (e.g., Gmail, Yahoo, etc). When I email the whole class the message will go to lots of email addresses, and some email providers will block this as spam. You will want to check the settings of your spam filters so that they allow such messages.