

DISCOVER BIOLOGY (BIOB 101)
Fall Semester 2016

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Office hours: by appointment. Please email me to schedule

Course hours and location: This course is taught online via Moodle
(<https://moodle.umt.edu>)

Overview and Objectives

Welcome to the world of biology! Biology is a fascinating subject. In BIOB 101, *Discover Biology*, we will explore the natural world by examining the organization and complexity of living organisms and the systems in which they live. This course is a one semester course on the fundamental principles and concepts forming the foundations of the science of biology. In this course 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. Since this is an introductory course, in depth discussions of any one topic will not be possible, but the course will provide a general overview of many of the cornerstones of biology. At the end of the course, students will be able to:

1. Use vocabulary needed to discuss biological topics
2. Understand and summarize the scientific method
3. Understand the basic principles and ideas of chemistry and organic chemistry
4. Be able to explain the concept of a cell and describe the functions or its parts
5. Understand the flow of energy, photosynthesis, and cellular respiration
6. Understand the basic principles of inheritance as explained by Mendel and classic genetics
7. Be able to explain the concepts of DNA replication, transcription, and translation as they relate to cell function and cell division.
8. Understand the basis of organism classification systems.
9. Understand the process of evolution and how evolution accounts for the unity and diversity of life
10. Be equipped to apply these principles to problems and issues of everyday life and on the way to becoming scientifically literate citizens.

Discover Biology is a cumulative course, so that your success in grasping the material presented one week will depend on your having mastered material presented in previous weeks. It is essential for you to keep up with the readings and assignments. If you fall behind, it will be difficult to catch up. If you find yourself in trouble, 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.

Learning is not a passive activity in BIOB 101 (and in all your coursework!) you need to take an active role. 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

I have divided the course into 10 units. Each unit is broken into 3-5 modules. You can complete the work in whatever amount of time that works for you. I have provided due dates in to keep you on track throughout the semester. The hard deadline is the week of exam. ***All assignments corresponding to the units covered in the exam are due by Friday at 11pm the week of the exam.*** Each unit will include lectures, a lab exercise, quizzes and further insight exercises. To successfully complete the course, I recommend completing the recommended reading, lectures, labs, quizzes, and further insight assignments. I believe learning takes place through problem-solving. The course will include two unit topic exams and one cumulative final exam.

COURSEWORK

• Lectures and Labs

For each unit, I will present 3-5 lectures in either a pdf or video format that correspond to the module theme. Additionally there is a laboratory exercise for each unit. There are 10 laboratories organized along with their corresponding unit theme. You will turn in a document or complete a form via Moodle for each of these required labs.

• Recommended Readings

There is no required textbook for this course. I recommend using any Campbell Biology text or the free online text book in Biology available through [OpenStax](#). The bookstore offers access codes to [Mastering Biology](#). This resource has an e-text of Campbell's 10th edition as well as other online tools to assist in concept synthesis and learning management. None of these tools are required, but if you need or desire additional help and resources, they are available with cost. I have provided the chapters that correspond with our module themes for both the OpenStax (OS) textbook and Campbell Biology 10th edition (CB) in blue on the syllabus. If you find another biology text or different edition, I can assist you in determining the corresponding readings if you provide me the table of content for your text. If you do purchase the Mastering Biology access code and want to use the learning resources available, let me know so I can open those resources to you. Additionally, I will provide a few desk copies of Campbell Biology in the Mansfield Library reserve for use throughout the semester.

- ***Quizzes and Exams***

There are 40 quizzes (or problem sets) in this course corresponding to each module. These problem sets will require application of information from lectures and further insight exercises in new contexts related to the material. A quiz will be 1-10 questions. You will have **45** minutes to complete each quiz.

There will be three exams in total for this course. Two unit exams follow the associated lectures, problem sets, and further insight exercises. Those two exams are noted on the syllabus with the due date. The final exam will be comprehensive with about 70% new material and 30% older material from the two prior unit exams. Study guides will help you study for each exam. Each exam will consist of multiple-choice, true/false, short answer, and matching questions. Each unit exam will consist of 50 questions. You will have **90** minutes to complete each unit exam. The final exam will have 100 questions, and you will have **120** minutes to complete. The final must be completed the last day of Finals Week (consult the schedule below).

Once begun, exams must be completed as students cannot exit and re-enter the exam. It is the students' responsibility to utilize a reliable internet connection. If you experience technical difficulties please contact me as soon as possible.

- ***Further Insight Exercises***

To perform well on the quizzes and exams, one must use problem-solving to tackle a biological concept. Many course units will include further insight videos or exercises. Further insights (FI) give you the opportunity 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.

- ***Forums and "Office Hours"***

There is a discussion forum at the top of the Moodle page which students can use to post comments/questions about course material. I ask that you please refrain from posting anything exam-related. I will read the posts and answer them if appropriate. I aim to provide answers within 24 hours. If additional feedback is required, students can request a "live" online chat by appointment only to be facilitated through Collaborate Ultra in Moodle or meet me at my office on the UM campus.

- ***Taking Notes and Keeping a Lab Notebook***

I strongly recommend that you take notes while watching videos, reviewing lecture materials, and when completing further insights exercises. Additionally, I recommend keep a lab notebook with details about what you did, how you did it, what you found, and your thoughts. [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.

- **Grading**

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

2 Lecture Exams (at 100 pts each)	200
1 Final Exam (at 150 pts each)	150
40 Quizzes (at 10 pts each)	400
10 Laboratory Assignments (at 25 pts each)	<u>250</u>
Total	1000

COURSE POLICIES

- ***Late submission of work and examinations***

There will be a penalty for late submission of work. **10** points will be subtracted each week for late homework or exam. I will take into account any **documented** extenuating circumstances. But try your utmost to **NOT TO FALL BEHIND!**

- ***Technical Requirements***

Students must have software capable of downloading and reading PDF files and their computer must be Java-enabled. Some of the online labs require Java. I have found Mozilla to be the best at handling those labs. **IMPORTANT** - it is imperative that you take the Moodle tutorial. This important orientation will require less than 1 hour of your time and will be in your quiz 1 for Unit 1. You will earn a Moodle certificate which is a requirement for this course. For those who have done it in other courses, you may upload your certificate to Moodle or send it to me via email.

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

University policies on drops, adds, changes of grade option, or change to audit status will be strictly enforced. These policies are described in the 2015-16 UM course catalogue, [http://www.umt.edu/catalog//2015-2016 all catalog PDF.pdf](http://www.umt.edu/catalog//2015-2016%20all%20catalog%20PDF.pdf). The last day to drop fall courses without the Dean's signature is 5:00PM on Monday October 31st. Thereafter, a DROP may be requested by petition, but the petition must be accompanied by documentation of extenuating circumstances. Requests to drop a course or change the grade basis to benefit a student's grade point average will not be approved. A grade of D will not be considered passing for the P/NP option.

- ***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 own original work is the proper and honest use of sources. Failure to acknowledge whatever is not one's own 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 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 Disability Services for Students (DSS). If you think you may have a disability adversely affecting your academic performance, and you have not already registered with DSS, please contact DSS in Lommasson 154 and contact me as soon as possible. We are happy to work with you and DSS to provide appropriate accommodations for your learning and testing. For more information, please consult <http://life.umt.edu/dss/>.

- *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.

Discover Biology (BIOB 101) Course Schedule

Lecture Topic	Reading	Assignment	Further Insight
UNIT 1: Biology: The Science of Life			
Module 1: Course Overview	OS: 1 CB: 1 What is science? pdf	Q1: Moodle Q2: Syllabus Q3: Biology LAB: Graphing Due 9/9/2016	
Module 2: What is Science? Scientific Inquiry			
Module 3: What is Biology?			
UNIT 2: Evolution			
Module 4: History of Evolutionary Principles	OS:18, 19, 20 CB:22,23,24,25,26	Q4: Evolution Q5: Mechanisms Q6: Ancestry Q7: Diversity LAB: Evolution Due 9/16/2016	FI: What is NS? FI: Mechanisms FI: What is evolution? FI: 12 days of evolution FI: Whale evolution FI: Classification
Module 5: Mechanisms of Evolution			
Module 6: Evidence of Common Ancestry			
Module 7: Biological Diversity			
UNIT 3: Ecology			
Module 8: What is Ecology?	OS:44,45,46,47 CB:52,53,54,55,56	Q8: Ecology Q9: Populations Q10:Communities Q11:Ecosystems LAB: Immunity Due 9/30/2016	FI: Population Ecology FI: Mosquito Mystery FI: Herd Immunity FI: Ants and Acacia FI: Mimicry FI: GPP FI: Nutrient Cycles
Module 9: Populations			
Module 10: Communities			
Module 11: Ecosystems			
EXAM 1 on units 1, 2, and 3 (Exam and all assignments must be completed by 10/7/16)			
UNIT 4: Introduction to Chemistry			
Module 12: Atoms	OS: 2 CB:2,3,4	Q12: Atoms Q13: Bonds Q14: Water Q15: Carbon Q16: pH LAB: Water Due 10/14/2016	FI: Chemical Structure FI: Energy Concepts FI: Bonds FI: Redox Reactions FI: H2O molecule FI: H2O transport
Module 13: Chemical Bonding			
Module 14: What's so special about water?			
Module 15: What's so special about Carbon?			
Module 16: Acids, Bases, and Buffers			
UNIT 5: Biological Macromolecules			
Module 17: Organic Molecules	OS: 3 CB: 5	Q17: Organic Q18: Carbs Q19: Fats Q20: Proteins Q21:Nucleic Acids LAB: Enzymes Due 10/28/2016	
Module 18: Carbohydrates			
Module 19: Lipids			
Module 20: Proteins			
Module 21: Nucleic Acids			
UNIT 6: The Cell			
Module 22: What is a Cell?	OS:4, 5 CB: 6,7	Q22:Cell Q23:Pro vs. Eu Q24:Structure Q25:Membrane LAB: Osmosis Due 11/11/2016	
Module 23: Prokaryotic vs. Eukaryotic			
Module 24: Eukaryotic Structure			
Module 25: Membrane Transport			

UNIT 7: Energy			
Module 26: Laws of Thermodynamics	OS: 6,7,8,9 CB: 8,9,10,11	Q26:Laws of Energy Q27:Photosynthesis Q28:Respiration Q29:Regulation LAB: Respiration Due 11/18/2016	
Module 27: Photosynthesis			
Module 28: Cellular Respiration			
Module 29: Pathways and Regulation			
Exam 2 on units 4,5,6,and 7 (Exam and all assignments must be completed by 11/18/16)			
UNIT 8: Cell Division			
Module 30: Cells and Chromosomes	OS: 10, 11 CB: 12,13	Q30:Chromosomes Q31:Mitosis Q32:Meiosis LAB: Cells Due 11/25/2016	
Module 31: Mitosis			
Module 32: Meiosis			
UNIT 9: Classical Genetics			
Module 33: Heredity and Mendel	OS: 12,13 CB: 14,15	Q33:Mendel Q34:Crosses Q35: Inheritance Q36: Humans LAB: Pedigree Due 12/2/2016	
Module 34: Monohybrid and Dihybrid Crosses			
Module 35: Patterns of Inheritance			
Module 36: Human Inheritance			
UNIT 10: Molecular Genetics			
Module 37: DNA is the genetic material	OS: 14,15,16,17 CB: 16,17,18,20	Q37:DNA Q38:Central Dogma Q39: Regulation Q40:Biotechnology LAB: DNA Due 12/9/2016	
Module 38: Central Dogma			
Module 39: Gene Regulation			
Module 40: Biotechnology			
Final Exam (~ 70% from units 8,9,and 10 and 30% from prior exams) Exam and all assignments must be completed by 12/16/2016			

*** Please note this course schedule is subject to change. Changes, if any, will be announced at the top of the Moodle page. Students will be held responsible for all changes.**