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BIOB 160N.01: Principles of Living Systems

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PRINCIPLES OF LIVING SYSTEMS (BIOB 160N)

Spring Semester 2019

MWF 11:00AM-11:50AM in Liberal Arts (LA) 11

Instructor

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[Campus map](#)

Overview and Objectives

Biology encompasses a diverse set of disciplines that includes biochemistry, molecular and cell biology, genetics, evolutionary biology, ecology, behavior, ecosystem biology, conservation biology, human and veterinary medicine, agronomy and more. Knowledge of biology is also increasingly important in other disciplines, such as economics, politics, social policy, ethics, business, technology, engineering and design, and architecture. In fact, it is difficult to find any human activity for which an understanding of biology has not become relevant and important.

BIOB 160N, *Principles of Living Systems*, is a broad survey course that is a prerequisite for all options in the Biology and Wildlife Biology majors, and is generally required for all pre-professional programs in the health sciences. In BIOB 160N we will work to develop a strong foundation for your future studies in Cell and Molecular Biology, Genetics and Evolution, Developmental Biology, Anatomy and Physiology, Ecology, and related options.

Learning Outcomes

This course will prepare students for more detailed investigation and advanced study as they progress through the biological curriculum. Upon completion of BIOB 160, students will have gained a deeper understanding of the general principles of biology as a whole and a broad but solid foundation of knowledge of the form and function of living systems. By the end, students will have a general understanding of five core concepts of biology: 1) evolution; 2) structure and function; 3) information flow, exchange, and storage; 4) transformations of energy and matter; and 5) systems.

This course is the first exposure to the rigors of scientific thinking, experimentation, and exploration. Students will be exposed to the various important principles that guide scientific discovery in the biological world. Learning goals will introduce a set of core competencies, namely the ability to: 1) apply the process of science, 2) use quantitative reasoning, 3) use modeling and simulation, 4) tap into the interdisciplinary nature of science, 5) communicate and collaborate with other disciplines, and 6) understand the relationship between science and society. Students will learn the basics of hypothesis development and testing with an eye towards applying that knowledge in their future science-based courses and fields of study.

In particular, students will:

1. Grasp how science works (What is science? What is not science?);
2. Learn how to construct *testable* questions, design experiments that test such questions, then interpret observational data that answer those questions;
3. Learn how to communicate your ideas about the structure, function and evolution of living systems;
4. Understand the basic physical and chemical properties that characterize living systems;
5. Know the main types of molecules common to all living systems;
6. Understand how energy is captured, stored, used, and passed through living systems;
7. Understand how biological information is preserved, inherited and modified;
8. Understand how stored biological information is unpacked to make biological machines;
9. Understand how the processes of natural selection and evolution work; 10. Understand some of the ways that humans affect biological processes on Earth.

Principles of Living Systems is a cumulative course, so that your success in grasping the material presented one week will depend on having mastered material presented in previous weeks. It is essential for you to keep up with the readings and homework assignments. If you fall behind, it will be difficult to catch up. For this reason, there will be weekly assignments on the online platform, LaunchPad.

If you find yourself in trouble, please advise your professor or learning assistants as early as possible. We will be better able to help you if you talk with us as problems arise; we will be less sympathetic ten minutes before an exam. If you cannot meet at any of the designated office hours, please work to schedule an appointment at another time.

Learning is not a passive activity; in BIOB 160 (and in all your coursework!) you need to take an active role. We are here to facilitate your learning, but we ask that you:

- Come prepared and actively participate in the class meetings
- Be prepared and willing to work cooperatively in groups during class meetings
- Reflect objectively on your own progress and understanding

10 things that require ZERO talent:

1. Being on time
2. Work ethic^[L]_[SEP]
3. Effort^[L]_[SEP]
4. Body language
5. Energy
6. Attitude^[L]_[SEP]
7. Passion^[L]_[SEP]
8. Being coachable
9. Doing extra^[L]_[SEP]
10. Being prepared

Textbook & LaunchPad Online Homework

You will be able to access most of the resources for this class on the course [Moodle site](#). We will post pdf files of lecture notes as well as other information. You will need your NetID and password to access the Moodle site, which you can look up [here](#).

This course uses Hillis, *et al.*, *Principles of Life*, 2nd edition and an associated online homework service called LaunchPad. These two resources are being delivered to you electronically. (A physical copy of the book will also be available at the bookstore.) To access your content, log in to the BIOB 160 Moodle site, click the link called Textbook and LaunchPad Instructions, then follow the instructions we've put in there. Detailed instructions for accessing LaunchPad are also [here](#).

LaunchPad will give you access to the textbook, and practice with the material that we cover in class. You will have regular assignments to do on this site. To help you prepare for class discussion, assigned reading and the LaunchPad homework quiz will generally cover material to be discussed in class the upcoming week. Online quizzes are due *before class* the first day of class for a given week.

There will be no make-up quizzes. If you miss the deadline for online quizzes or assignments you lose all the points for that quiz or assignment. (However, the three lowest quiz scores will be dropped and not cause you to lose points.) Your score in LaunchPad will make up 100 of 700 points for your grade in class.

If you have any questions concerning access, please reach out to The Bookstore at UM or email help@redshelf.com or consult their public knowledge base, RedShelf Solve solve.redshelf.com. For any questions about billing please contact Amanda Peterson apeterson@montanabookstore.com. In addition, if you want a hard copy of your own (and you're signed up for the all-inclusive package), you can go to the UM Bookstore to request a print-out of the entire thing for an additional \$40.

iClickers

We will use the iClicker response system in lecture this semester. This technology will provide you (and us!) with valuable feedback about what you know and don't know and will help promote better learning and understanding of the concepts presented in lecture. You have two choices for participating using iClicker. Please choose the one that best fits your

needs and budget. We recommend that you use the [iClicker Reef Application](#) (\$14.99) on your own smart device (iPhone, Android, tablet or laptop). If you do not have a smart device, you can purchase an [iClicker 2 Student Remote](#) at the UM Bookstore (\$60) or used online. Whatever clicker tool you choose, **you must register**

your clicker online at: www1.iclicker.com/register-clicker/ Software: iClicker Classic; LMS: Moodle.

Participation using iClickers will make up 100 points (about 14.3% of your grade) in class. Note that you may not bring a friend's iClicker to class and answer questions for him/her. We will consider this cheating, and if we see you do this you will not get any participation points for the entire semester.

Cost breakdown for course materials. All students in BIOB 160 are granted free online access (for Spring 2019) to the textbook (Hillis 2nd edition) and online homework service (LaunchPad). In addition, you'll need access to the iClicker response system that we're using in class. This requires either that you have a hardware clicker (\$30 - 60) or that you sign up for an iClicker Reef account (\$14.99) onto your phone, tablet, or laptop.

Diversity

Diversity is a source of strength, creativity, and innovation at the University of Montana. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals. The University of Montana fulfills its public mission by creating a welcoming and inclusive community for people from every background— people who as students, faculty, and staff serve Montana and the world.

Grading

We will use “reverse grading” in this course. The total points possible is 700. Everyone starts with an “A” (700 points) on day one and then you lose points over the course of the semester. Your grade will be based on the following weighting of course components: Exams: 300 points total (the lowest score will be dropped); online quizzes: 100 points (the lowest three will be dropped); homework assignments: 100 points; iClicker: 100 points; and final exam: 100 points.

Grades in the lecture part of the course will be assigned in the +/- system. The students with that retain more than about 90% of the points will receive A/A- grades; and the students who retain fewer than about 60% of the points will receive a failing grade. The grades in between will typically be 80-89% = B; 70-79% = C; 60-69% = D.

Exams

You will take four 50-minute exams and one 1-hour Comprehensive final exam, all of equal value, each worth 100 points. Each exam will consist of multiple-choice and matching questions whose answers will be recorded on electronically-graded Scantron forms (which you will have to bring). The only things you will need to bring on exam days are #2 pencils and a scantron, and, if you wish, a calculator. All electronic devices (except calculators) must be stowed and in the “off” position. On the day of the final exam, you will need two scantron forms, one for the last exam and one for the final exam.

There will be no make-up exams. Students who have conflicts due to athletic or other scheduled events will notify the instructor at least two weeks in advance and accommodations will be made to take the exam early. Please notify the instructor if you have a verifiable medical excuse or emergency. If a student has already missed one exam due to a verifiable medical excuse or emergency, and has another verifiable medical excuse or emergency, accommodations *may* be made to take the exam the next day by communicating with the instructor.

Course Learning Assistants

There will also be a set of undergraduate Learning Assistants in the class. These advanced biology students will help with class discussions and activities, and they will be a great resource for discussing class materials.

Study Jam sessions for students enrolled in biology courses are Mondays from 6:30-9 pm in Lommasson 229, Griz Central (new for Spring 2019).

Extra credit: None offered.

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. We are happy to work with you and DSS to provide appropriate accommodations for your learning and testing. Students with disabilities and/or students who have had to miss class due to documented illness or participation in University-sanctioned activities may request to listen to these via the course YouTube channel.

Computers

The Division of Biological Sciences maintains a computer lab dedicated for use in biology courses. It is located in Health Sciences 114. You can log in using your netID. There are also lots of computers available in the Mansfield Library and in the basement of the Payne Family Native American Center.

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 we email the whole class, the message will go to lots of email addresses, and some email providers will block this as spam. You should check the settings of your spam filters so that they allow such messages.

Plagiarism and Cheating

Although you will be encouraged to work collaboratively with others in this class and the lab, ***the work you hand in must be your own.*** This includes the iClicker: ***you may only use your own iClicker.*** A good rule of thumb is that you can work together up to the point of committing words to paper (or computer). 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 professors or your TA 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. For more information on UM policies on plagiarism, see the [Student Conduct Code](#).

Adds, drops, and changes of grading

University policies on drops, adds, changes of grade option, or change to audit status will be strictly enforced in BIOB 160N. These policies are described in the [course catalog](#). The last day for dropping the course with a refund is January 31, 2019.

For more information, see UM's [dates and deadlines](#) document.