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### BIOB 160N.01: Principles of Living Systems

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# **PRINCIPLES OF LIVING SYSTEMS (BIOB 160N)**

## *Summer Semester 2022*

Delivery will be remote, ***asynchronous***, using zoom ID:

**ZOOM ID:** <https://umontana.zoom.us/j/99928503812>

### **Instructor**

Professor: Dr. Katie Holick

Email: [katie.holick@umt.edu](mailto:katie.holick@umt.edu)

Office Hours: By appt. Live or Zoom

Office: Skaggs 395C

[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 pre-requisite 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.

If you find yourself in trouble, please advise your professor as early as possible. I 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
3. Effort
4. Body language
5. Energy
6. Attitude
7. Passion
8. Being coachable
9. Doing extra
10. Being prepared

## Textbook

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](#).

### Textbook:

**Hillis, et al., *Principles of Life*, 3<sup>rd</sup> edition.**

To access your content, log in to the BIOB 160 Moodle site, click the link called iClicker and Textbook Instructions, then follow the instructions we've put in there.

Students can now access course content via VitalSource or RedShelf websites for more information (<http://info.macmillanlearning.com/JF0RC10unG0OV0c3vw000b0> or <http://info.macmillanlearning.com/I0F1W000Rncw3G0vb0O0v0C>). If you have any questions concerning access, please reach out to The Bookstore at UM or email [help@redshelf.com](mailto:help@redshelf.com) or consult their public knowledge base, RedShelf Solve - [solve.redshelf.com](http://solve.redshelf.com). For any questions about billing please contact Amanda Peterson [amanda.peterson@mso.umt.edu](mailto:amanda.peterson@mso.umt.edu). 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 book for an additional \$40.

## iClickers

We will use the iClicker Reef response system in lecture this semester. The iClicker link is found on the "Syllabus and Additional Information" moodle page. Please use this to register. 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. We recommend that you use the [iClicker Reef Application](#) (5\$) on your own smart device (iPhone, Android, tablet or laptop). **You must register your clicker online at: <https://app.reef-education.com/#/login>** **Software: iClicker Reef; LMS: Moodle. Please enter your 790-number student ID, and check it carefully.** (If you don't enter your student ID correctly, you will not receive credit for participation.) Instructions for creating your iClicker account and registering can be found here: <https://macmillan.force.com/iclicker/s/article/How-to-Create-an-iClicker-Reef-Student-Account-for-Online-Classes>.

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.

## 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.

## Course Policies

### **1. NO MAKEUP EXAMS, QUIZZES, OR HOMEWORK WILL BE GIVEN.**

**2. Exam and assignment Regrades:** You have two weeks following an exam return to request a regrade from Dr. Holick. Any request must be justified with a full written explanation. Please note that as your entire exam is reassessed, this has sometimes resulted in a loss of points when other grading errors were discovered. After the two-week period, no other regrades requests will be accepted.

### **5. Quizzes & Study Guides:**

#### **Study Guides**

Study Guide assignments can be found online on Moodle. Late quizzes/Study Guides will receive a zero. Study Guides are based on the assigned reading/posted lectures and assume you have done the reading prior to taking the quiz. Study Guides would be preferably done before class but will be due Thursdays at Midnight.

#### **Quizzes**

Quizzes are due by the end of the day on Thursdays and will be administered via the iClicker system and are integrated into the lectures. Quizzes will be based on participation but this may change if the system becomes abused. Many assignments will have a review component of previous material too. You may drop your three lowest three lowest quiz scores.

**6. Exams:** Five exams and one final exam will be given. Semester exams are given on Fridays during a time you elect and sign up for on Moodle. Your lowest exam grade will be dropped. The final examination is cumulative and must be completed to receive a final grade. Failure to take the final exam will result in a failing grade. *All students are expected to take all exams when they are scheduled.* Students are expected to notify the instructor prior to missing an exam. Students are responsible for any changes in dates of scheduled exams, quizzes, or assignments or any other administrative announcement made during lectures.

**7. Writing assignment - Your assignment is to write an opinion piece on any issue in cell biology you care about.** Your piece must

be 500-750 words. You must have at least 5 CREDIBLE citations and one must be from a primary literature source. You must take a stance on the issue. However, do not rant, but present a well-reasoned argument. Be sure to acknowledge to other side of the issue. If you think other side is wrong, you can also base you piece on dismantling it using your references. Offer solutions and/or compromises in your piece. Your piece must be for a general audience: persons with very limited biology knowledge. You should use examples and analogies to explain any biology concepts. Look for great examples that will bring your argument to life, including personal stories/connections.

<b>Your performance will be evaluated as follows:</b>	<b>%</b>	<b>#</b>	<b>Points/Item</b>	<b>Total Points</b>
Final Project	12.5%	1	100	100
Quizzes	18.8%	15	10	150
Study Guides	12.5%	5	20	100
Semester Exams	50.0%	4	100	400
Cumulative Final Exam	6.3%	1	50	50
Total	100%			800

<i>Final letter grades will be assigned as follows:</i>					
<b>Points % Grade</b>			<b>Points % Grade</b>		
930-1000	93-100	A	730-769	73-76.9	C
900-929	90-92.9	A-	700-729	70-72.9	C
870-899	87-89.9	B+	670-699	67-69.9	D+
830-869	83-86.9	B	630-669	63-66.9	D
800-829	80-82.9	B-	600-629	60-62.9	D
770-799	77-79.9	C+	<600	<60	F

**Disability Modifications:** The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and the Office of Disability Equity (ODE, formerly Disability Services for Students). If you

think you may have a disability adversely affecting your academic performance, and you have not already registered with ODE, please contact ODE in Lommasson Center 154 or call (406) 243-2243. I will work with you and ODE to provide an appropriate modification.

### **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 consult with the Writing and Public Speaking Center 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](#).

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