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BIOB 160N.01: Principles of Living Systems

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PRINCIPLES OF LIVING SYSTEMS (BIOB 160N)

MWF, 11 – 11:50 am in University Hall 210
Spring Semester 2017

Instructor
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Office: Health Science 204b
Office hours: Monday and Friday at 12-1 PM, or by appointment

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.

Principles of Living Systems is a broad survey course that is a pre-requisite for all options in the Biology and Wildlife majors, and is generally required for all pre-professional programs in the health sciences. In *Principles of Living Systems* 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
Following this class, you will be expected:

1. Understand how the processes of natural selection and evolution work;
2. Grasp how science works (What is science? What is not science?);
3. Learn how to construct *testable* questions, design experiments that test such questions, then interpret observational data that answer those questions;
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 though living systems;
7. Understand how biological information is preserved, inherited and modified;
8. Understand how biological information is stored and unpacked to make proteins.

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 let me know 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 ten minutes before an exam. If you cannot meet at any of the designated office hours, please schedule an appointment with me at a more convenient time.

Learning is not a passive activity - you need to take an active role! I am here to help your learning, but I ask that you:

- Take responsibility for coming prepared to class
- Keep up with the readings and Mastering Biology Assignments
- Be prepared to participate during class meetings
- Reflect objectively on your own progress and understanding

Course Schedule

In addition to material we cover in lectures, you will be responsible for readings indicated below.

Week of	***Topic***	***Reading from Text***
January 23	Introduction and overview. Natural selection and evolution – How to make a dog	Chapter 1, pages 1-15 Chapter 22
January 30	Galapagos and Darwin's Finches Types of selection What is science? Flies and spiders.	Chapter 23, pages 491-494 Chapter 1, pages 16-24
February 6	Animal Behavior	Chapter 51
February 13	Amazing Water! Amazing Carbon!	Chapter 3 Chapter 4
February 20	***No class Monday (Presidents Day)*** ***Test 1- Friday, February 24***	
February 27	Biological Macromolecules: carbohydrates and lipids	Chapter 5, pages 66-75
March 6	Biological molecules: proteins and nucleic acids	Chapter 5, pages 75-89
March 13	Cells: windows on life's unity and diversity	Chapter 6
March 20	***March 20-24 Spring Break***	
March 27	Energy and metabolism ***Test 2 - Friday, March 31***	Chapters 8
April 3	Cellular respiration	Chapter 9
April 10	Photosynthesis	Chapter 10
April 17	Mitosis	Chapter 12
April 24	Meiosis and DNA replication	Chapter 13 and 16
May 1	The central dogma of biology – from DNA to protein	Chapter 17
May 9	**FINAL EXAM is Tuesday, 10:10-12:10 in ISB 110**	

Grading

Grades in the lecture part of the course will be assigned in the +/- system, according to the following scheme:

Grade	Percent of Total Points
A	93-100%
A-	90-92.99%
B+	87-89.99%
B	83-86.99%
B-	80-82.99%
C+	77-79.99%
C	73-76.99%
C-	70-72.99%
D+	67-69.99%
D	63-66.99%
D-	60-62.99%
F	Below 60%

Your grade will be based on the following weighting of course components:

Component	Weighting
Exam 1	20%
Exam 2	20%
Final exam	20%
MasteringBiology	25%
iClicker	15%
Total	**100%**

Exams

You will take two 50-minute in-class exams and one 2-hour comprehensive final exam. Each exam will be worth 20% of your grade. 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.

Make-up exams will be administered one week *after* the scheduled exam. Make-up exams will consist entirely of essay questions, and will include additional lecture material covered after the regularly scheduled exam. Students generally find make-ups to be more difficult than the regularly scheduled exam. Only students presenting verifiable medical or university excuses at least 24 hours before the regularly scheduled exam will be eligible for a make-up exam. No early final exams will be given.

MasteringBiology Homework Assignments

In order to complete your homework assignments, you must have a MasteringBiology account administered by the textbook's publisher. MasteringBiology is an online resource that will give you practice with the material that we cover in class and in your readings. You will have regular assignments to do on this site. In addition, a significant fraction of the questions on your in-class exams and final exam will be taken directly from the MasteringBiology assignments. Your score in MasteringBiology will make up 25% of your grade in class. I will drop your LOWEST three MasteringBiology scores – they won't affect your grade.

iClickers

We will be using iClicker2 technology in class. You can buy a clicker at the UM Bookstore new or used. In addition, you can use your own smart phone rather than buying an iClicker2. To do this, you need to purchase the appropriate REEF Polling app (either Apple or Android version - https://www1.iclicker.com/products/reef-polling/). You will need to register your iClicker2 or REEF Polling app through the class Moodle site. We'll start using the clickers during the second week of class. Your iClicker2 participation will count for 15% of your grade. I will drop the three lowest iClicker2 grades.

The clickers will provide you and me with valuable feedback about what you know and don't know. Starting the second week of class, we will use them in most class periods. Note that you may not bring a friend's iClicker2 to class and answer questions for them! This is cheating, and you will both receive an F and be dropped from the class.

Course Material

You will be able to access many of the resources for this class on the course Moodle site. I will post copies of the PowerPoint lectures, study guides and other information.

The textbook for BIOB160 is Campbell Biology, 10th edition. There are several copies on reserve in the library.

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. 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 we 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.

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 BIOB160N.
For more information, see
UM's http://www.umt.edu/registrar/PDF/OfficialDatesDeadlinesSpring2017.pdf dates and deadlines document.