BIOL 102 – Biology and Society 01
Course Syllabus: Spring 2014

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Office Hours: MWF 9:30-10:20 REN
Lectures: MWF 8:30-9:20 in REN 126
Textbooks: **Essential Biology with Physiology,** 4th ed., 2012. Simon, Reece & Dickey

***Course Description*:**
There has never been a better day to start learning biology. Being a living thing you interact with the natural world each day. BIO 102 takes the most important content of biology organizing it into four core areas: evolution and ecology; cells; genetics; and animal systems. The goals of the course are to create a better understanding of the living world, relate the core content to students' lives, clarify the process of science and demonstrate how evolution is the overarching theme of biology. Students will start with the big picture of evolutionary processes and ecological systems. Evolution is set at the beginning of the course but will be revisited in every unit thereafter. Students will then dive into the smallest unit of life, the cell, and explore cellular structures, functions and processes. In the third unit students will study DNA and how genetics impacts their lives. The final unit describes the interface between form and function in animals. Through these four units, it is my hope that you will make important connections between biology and how it applies to your own life. Biology 102 is a part of the University of Idaho General Education curriculum that emphasizes a multi-year, broad liberal education. This course will discuss environmental issues, genetics and human health topics that will be integrated into other courses you take here.

***Class Notes and Other Course Information*:**
All class information can be found on the class site on Bb LEARN **https://www.bblearn.uidaho.edu**. You will be prompted to enter your username (vand1234) and password (same as your email account) to access course materials. Lecture notes with review guides at the end will be posted as study aids.

***Grading*:**

• 3 lecture exams (100 pts each)	300
• Comprehensive final exam	150
• In Class Pop Quizzes: (10 pts each)	50
TOTAL	500

***Calculating Your Grade*:**
Letter grades are awarded based on the University of Idaho grade scale:

A	90 – 100%
B	80 – 89.9%
C	70 – 79.9%
D	60 – 69.9%
F	0 – 59.9%

Grades will be provided on the "My Grades" section of blackboard.

Absence from Exams:
Absences from an exam will only be excused with a written letter in advance documenting reasons of illness, family emergency or conflict with an official university function (Athletics, FFA, Ag Ambassadors, course field trips, etc).

Exam Policy:
Students with university excused absences during the exam period must notify the instructor in advance. *Failure to notify instructor in writing (email)* ***three days in advance*** *will result in you NOT being allowed to make-up the exam*. Not showing up for the exam means you get a zero. Please note that it is departmental policy for NO EARLY FINAL EXAMS. Please make your travel arrangements accordingly.

Grading Concerns:
Exam keys will be available in class or on blackboard. If you think your exams or homework were incorrectly graded, you must submit your concern to the instructor within 3 days of receiving your graded assignment. If you would like to resubmit an exam answer for re-grading, a paragraph including at least one reference about your grading concern must be submitted to the instructor within 3 days of receiving your exam.

Exam Format:
Three unit exams and one final exam will consist of a combination of fill in the blank, matching, short answer and multiple-choice questions. Lecture exams will be scheduled during the normal lecture period. Lecture reviews will be attached to the end of every lecture to help guide you to the important information. Lectures will be posted on blackboard to help you study for exams. It is your responsibility to review the material and schedule appointments with the instructor if you have any questions. **THE FINAL EXAM WILL BE HELD ON FRIDAY, MAY 16TH 7:30-9:30AM. NO EARLY OR LATE FINALS WILL BE GIVEN.**

Readings & Quizzes:
Readings are assigned below by chapter in Simon. In addition there will be eight pop quizzes throughout the semester. Five pop quizzes will be counted for 50 points. Three additional quizzes will be given as extra credit. **NO QUIZ MAKE-UPS WILL BE GIVEN.**

Academic Dishonesty:
Acts of cheating or plagiarism will not be tolerated. Your exams and quizzes must be your own work. According to university policy cheating or plagiarism can result in you failing this class. This includes giving your work to others to copy.

→Cheating refers to the acquisition of answers to test questions in a dishonest fashion.

→Plagiarism is defined as i) the representation of another person's work as your own, in its entirety or *with slight changing of wording*, ii) the use of writing from published sources without citing the author(s) or iii) downloading material from the internet and presenting it as your own work.

UI Faculty-Staff Handbook: its.uidaho.edu/fsh/2300.html outlines the expected code of conduct for students at the University of Idaho. Article II addresses academic honesty of students.

Course Outline:

Unit 1: Ecology & Evolution

DATE	LECTURE TOPIC & EXAM	READING
1-15	SEMESTER OVERVIEW	CHAP 1
1-17	POPULATION ECOLOGY	CHAP 18 & 19
1-20	**NO CLASS-UI CLOSED**	
1-22	COMMUNITY ECOLOGY	CHAP 20
1-24	ECOSYSTEM ECOLOGY	CHAP 20
1-27	HUMAN IMPACTS	CHAP 18 & 20
1-29	HUMAN IMPACTS	CHAP 18 & 20
1-31	DARWIN & EVO INTRO	CHAP 13
2-3	SPECIATION	CHAP 14
2-5	MICROBE EVOLUTION	CHAP 15
2-7	PLANT & FUNGI EVOLUTION	CHAP 16
2-10	ANIMAL EVOLUTION	CHAP 17
2-12	CHORDATE EVOLUTION	CHAP 17
2-14	REVIEW (IN CLASS)	
2-17	**NO CLASS-UI CLOSED**	
2-19	**EXAM 1: ECOLOGY & EVO**	

Unit 1 Learning Outcomes:

- Students will be able to define the scope of biology and list seven characteristics of living things.
- Students will be able to describe a population in terms of its density, age structure, growth and distribution across a given area.
- Students will be able to describe density-dependent and density-independent factors that influence populations and their growth.
- Students will understand how the population of humans has grown over time and the impacts of this growth on other living things.
- Students will be able to describe five interactions within a community and how communities change over time.
- Students will be able to draw a food chain or food web, and answer questions about how energy flows within an ecosystem.
- Students will observe four nutrient cycles and be able to explain how nutrients are recycled within an ecosystem.
- Students will discuss various human impacts that influence the populations, communities and ecosystems around us.
- Students will be able to describe some conservation biology solutions to various environmental problems seen today.
- Students will be able to describe how Charles Darwin and Alfred Wallace fit into history, and will be able to describe the process of natural selection.
- Students will be able to list five pieces of evidence for evolution.
- Students will understand historical classification systems and be able to read/create newer evolutionary trees.
- Students will be able to list at least five mechanisms for evolution and three patterns of selection.
- Students will be able to define the word species and will know the difference between prezygotic and postzygotic mating barriers.
- Students will be able to describe two mechanisms of speciation.
- Students will survey the tree of life and the theories about how the diversity of organisms on Earth have changed over time.

Unit 2: Cells & Processes

DATE	LECTURE TOPIC OR EXAM	READING
2-21	BIOCHEMISTRY INTRO	CHAP 2
2-24	MACROMOLECULES	CHAP 3
2-26	CELL MEMBRANES	CHAP 4
2-28	MEMBRANE TRANSPORT	CHAP 5
3-3	CELL STRUCTURES & FUNCTION	CHAP 4
3-5	ENERGY & ENZYMES	CHAP 5
3-7	RESPIRATION & FERMENTATION	CHAP 6
3-10	PHOTOSYNTHESIS	CHAP 7
3-12	REVIEW (IN CLASS)	
3-14	**EXAM 2: CELLS & PROCESSES**	

Unit 2 Learning Outcomes:

- Students will understand that organisms are also chemical systems made up of atoms, elements, compounds and macromolecules.
- Students will be able to list the four macromolecules, name at least one important function for each and will be able to describe the chemical reactions that break them down and build them up.
- Students will understand four types of chemical bonds that are frequently found within living things.
- Students will understand the importance of carbon as the backbone of life and the important properties of water that enable life on Earth.
- Students will understand the structure and main functions of the plasma membrane.
- Students will distinguish between passive and active transport, and know how examples of each work to move materials across the plasma membrane.
- Students will compare and contrast prokaryotes verses eukaryotes, and plant verses animal cells.
- Students will list all the cell organelles, describe their functions and state whether they belong to the endomembrane system or not.
- Students will understand the chemical structure of ATP and why it is an important energy molecule for cells.
- Students will be able to describe the composition of enzymes, how they function to speed up chemical reactions and how they can be inhibited.
- Students will know the four steps to cellular respiration, what each reaction does during this process, where the reaction occurs within the cell and how this process generates ATP for cellular work.
- Students will compare and contrast fermentation to cellular respiration.
- Students will be able to list the order of photosynthesis reactions, what each does for a producer and where these reactions occur within the cell.

Unit 3: Genetics

DATE	LECTURE TOPIC OR EXAM	READING
3-17 to 3-21	**NO CLASS-SPRING BREAK**	
3-24	DNA & REPLICATION	CHAP 10
3-26	MITOSIS	CHAP 8
3-28	MEIOSIS	CHAP 8
3-31	MENDEL	CHAP 9
4-2	BEYOND MENDEL	CHAP 9
4-4	PROTEIN SYNTHESIS	CHAP 10
4-7	GENE EXPRESSION	CHAP 11
4-9	GENE EXPRESSION	CHAP 11
4-11	DNA TECHNOLOGY	CHAP 12
4-14	REVIEW (IN CLASS)	
4-16	**EXAM 3: GENETICS**	

Unit 3 Genetics Learning Outcomes:

- Students will know the history of how the shape of DNA was discovered by Watson, Crick and Franklin.
- Students will know the chemical structure, shape and directionality of DNA.
- Students will understand the overall cell cycle and checkpoints that help regulate the cell cycle.
- Students will be able to describe five enzymes that participate in DNA replication and how this process unfolds to copy DNA during S-phase of the cell cycle.
- Students will be able to list in order the five steps of Mitosis, 1-3 significant things that happen within each step and the overall result of this process.
- Students will be able to list in order the steps to Meiosis, 1-3 significant things that happen within each step and the overall result of this process.
- Students will compare and contrast Mitosis to Meiosis.
- Students will be able to describe some problems that can occur in Mitosis and Meiosis.
- Students will be able to define basic genetics terms like recessive traits, dominant traits, genotypes, phenotypes, homozygous, heterozygous, autosomal chromosomes and sex chromosomes.
- Student will understand how Mendel helped formulate two Laws of Inheritance.
- Students will be able to complete a simple Mendelian Punnett Square.
- Students will be able to create and read a pedigree tracing a trait through a family.
- Students will look at five inheritance patterns that extend beyond Mendel's understanding of genetics.
- Students will be able to list the three steps of transcription and translation, know where these processes occur within the cell and be able to state the resulting product made in each process.
- Students will be able to take a given length of DNA and write the complimentary DNA strand, MRNA strand and AA strand created in protein synthesis.
- Students will understand various base pair and chromosomal mutations that can occur.
- Students will be able to describe how genes are regulated in prokaryotic and eukaryotic cells.
- Students will discuss in class various ways we use DNA technology in our everyday lives including stem cell research, forensic science applications, genetically modified bacteria, virus or foods, cloning, genetic testing, DNA profiling, human gene therapy and some ethical issues relating to these applied uses of DNA.

Unit 4: Animal Form & Function

DATE	LECTURE TOPIC OR EXAM	READING
4-18	HUMAN BODY FORM & FUNCTION	CHAP 21
4-21	DIGESTIVE SYSTEM	CHAP 22
4-23	CIRCULATORY SYSTEM	CHAP 23
4-25	RESPIRATORY SYSTEM	CHAP 23
4-28	DEFENSE	CHAP 24
4-30	DEFENSE	CHAP 24
5-2	HORMONES	CHAP 25
5-5	REPRODUCTION	CHAP 26
5-7	NERVOUS SYSTEM	CHAP 27
5-9	REVIEW (IN CLASS)	
5-16	**FRIDAY MAY 16TH 7:30-9:30AM FINAL EXAM**	**REN 126**

Unit 4 Human Body Learning Outcomes:

- Students will be able to list 11 human body systems and a short function for each.
- Students will be able to define homeostasis.
- Students will compare and contrast negative and positive feedback systems.
- Students will be able to describe how the human body maintains a constant body temperature and regulates water balance by osmoregulation.
- Students will be able to trace the path of food through the human body, know the function of all the organs that participate in digestion, know what is required in human diets and know some associated problems with this system.
- Students will be able to trace blood throughout the double circulatory circuit, know the parts of the heart and how this functions to move materials throughout the body.
- Students will know the components of blood, what their functions are within the body and what is carried within blood.
- Students will be able to describe common cardiovascular disorders and some common treatments to these problems.
- Students will be able to trace air as it flows through the respiratory system, list the functions of these respiratory organs and understand four common problems with the respiratory system along with treatments for these problems.
- Students will understand the three lines of defense, which lines are innate verses adaptive, the cells that participate in these lines of defense and how the lymphatic system works with the immune system to fight off infections.
- Students will compare and contrast B cells and T cells in their form and function.
- Students will describe five common problems and treatments for the immune system.
- Students will look at 12 glands and twenty hormones to see how these chemicals help regulate human body function.
- Students will be able to trace the path of sperm and eggs, how fertilization occurs, early human development and the process of birth.
- Students will understand problems with the reproductive system and contraception.
- Students will look at the components of the peripheral and central nervous system.
- Students will be able to describe how nervous impulses are passed and how the nervous system interfaces with the muscular system and our senses.
- Students will be able to list some common problems with the nervous system.