

Introduction to Biology

Teacher: Disha Treya

Course Outline

The course is organized around **four big ideas** that provide a unifying structure for the course. In order to foster deep learning of biology concepts, students will be required to spend less time on factual recall and more time on close study of a finite number of examples in order to develop a larger, student-directed conceptual understanding of science practices for biology. Course topics include chemistry of living organisms, cell structure and functions, energy and its transformations, cell division process, genetics, ecology and evolution and review of current biology research.

TEXTBOOK. *Biology, The Core 2nd ed.* (Eric J Simon)

The four Big Ideas are:

Big Idea I: The process of evolution drives the diversity and unity of life.

Big Idea II: Biological systems utilize free energy and molecular building blocks to grow, to reproduce and to maintain dynamic homeostasis.

Big Idea III: Living systems store, retrieve, transmit and respond to information essential to life processes.

Big idea IV: Biological systems interact, and these systems and their interactions possess complex properties.

COURSE OUTLINE.

Unit 1- The Chemistry of Life

- The chemical context of life
- Water and the Fitness of the Environment
- Carbon and the Molecular Diversity of Life
- The structure and function of Macromolecules
- An introduction to metabolism

Unit 2- The Cell

- A Tour of the Cell
- Membrane Structure and Function
- Cellular Respiration: Harvesting Chemical Energy
- Photosynthesis
- Cell Communication
- The Cell Cycle
- Meiosis and Sexual Life Cycles

Unit 3 - Genetics

- Mendel and the Gene idea
- The chromosomal basis of inheritance

Unit 4 - Evolution

Descent with modification: A Darwinian view of life
The evolution of populations
The origin of species
Early Earth and the origin of life
Hardy-Weinberg Theory

Unit 5 – Bacteria, Viruses, Protists, Fungi

Unit 6 – Plant Form & Function

Plant Diversity I: How plants colonized land
Plant Diversity II: The evolution of seed plants
Plant structure and growth
Transport in Plants

Unit 7 – Ecology

Introduction to Ecology and the Biosphere
Population Ecology
Community Ecology
Ecosystems

Section I: Multiple-Choice

This consists of 40 multiple-choice questions that represent the knowledge and science practices that you should understand and be able to apply.

Section II: Free-Response

This section contains two essay questions 10 points each.

GRADING POLICY.

70% Exams
30% Paper/Presentation

COURSE POLICIES.

- You are a distinguished scholar and are expected to conduct yourself with a high standard of excellence to maintain a strong academic environment.
- Demonstrate courtesy and respect to ALL members of the class, including the instructor. You are responsible to follow the School Handbook and are responsible for your own behavior during all classroom activities.
- Failure to follow the rules may result in loss of points, zero on the assignment, or a disciplinary referral.

Late Work

Due to the nature of this course being a college level course, this class requires a much stricter late work policy than what some students may be aware of. Should you be absent due to illness or another circumstance, it is imperative that you email me to notify that you will be absent. Just as you would for "life after high-school", you would notify your college professor or employer that you would be missing the day's work. Therefore, if an assignment is turned in late, it will only be able to attain a maximum value worth 50% of the original total. You will have this option for 2 consecutive class periods. After that, the assignment will be worth a zero. This includes any assignments, tests and quizzes. For special projects, which will be noted upon assigning, such as where you are working with a partner/group, late work will not be accepted at all.

CLASS EXPECTATIONS.

Routinely check the class website for important information and due dates.

Everyone will be required to take notes during the lecture

Do not miss an exam. I reserve the right to produce an alternative test so as to ensure integrity of the testing procedure. Please inform me when you plan to be absent for extracurricular activities.