

SYLLABUS AP BIOLOGY

Teacher: Ms. Angela Rosales

Tutorial: TBA

TEXTBOOK: Sylvia Mader (Author), Michael Windelspecht (Author) - Biology 11th ed. 2010

Recommended: AP Biology (Kaplan) 2016 or any updated AP Biology review guide

AP Exam College Credit

Colleges vary in what score they will accept for credit. A score of 3 or better is passing.

AP Biology Exam

Monday, May 8, 2016 at 8:00 AM

COURSE OVERVIEW

The AP Biology Course is designed to be equivalent to a freshman college Biology course as stipulated by the AP Biology Curricular Requirements. Using the eight unifying themes promoted by the requirements, the course is introduced with the smallest essentials of life (molecules and cells), and progresses through to the more complex concepts including the structure and function of complete organisms and their interactions with the environment as well as with each other.

Outside readings and projects are included to further reinforce the concepts identified in the four big ideas, as well as eight inquiry-based investigations. Instruction is designed to promote an understanding of science as a process rather than as an accumulation of facts.

The allotted time for teaching the course is two ninety minute periods with one forty-five minute period, fifty-five minutes (25% of instructional time) will be allotted towards labs per week. The student is expected to spend an additional minimum of eleven hours per week outside class for preparation.

COURSE

The AP Biology Course is organized into 8 units which are outlined on a syllabus and given to students the first day of class. Each unit covers multiple biological “Big Ideas” as set forth in the Course Description. For example, Unit 8 on Ecology covers all four of the Big Ideas:

Big Idea 1: The process of evolution drives the diversity and unity of life.

Big Idea 2: Biological Systems utilize free energy and molecular building blocks to grow, to reproduce and to maintain dynamic homeostasis.

Big Idea 3: Living systems store, retrieve, transmit and respond to information essential to life processes.

Big Idea 4: Biological systems interact, and these systems and their interactions possess complex properties.

LABS

The course is structured around inquiry in the lab and the use of the seven science practices throughout the course.

Students will be required to complete a minimum of eight inquiry-based labs to fulfill the course objectives (two per “Big Idea”) for a minimum of 25% of the instructional time. Additional labs will be conducted to deepen students’ conceptual understanding and to reinforce the application of science practices within a hands-on, discovery based environment. All levels of inquiry will be used and all seven science practice skills will be used by students on a regular basis in formal labs as well as activities outside of the

lab experience. The course will provide opportunities for students to develop, record, and communicate the results of their laboratory investigations.

Students will be required to keep a laboratory notebook for all of the labs performed during or outside of class. The notebook will include answers to lab manual questions and/or a written lab report including title, purpose, topic investigated, procedure, and conclusion. The conclusion will include an analysis of collected data and any suggestions for better data collection and analysis. When required, the students will be given an additional two days to complete the lab report after conducting the laboratory investigation.

Science Practices

1. The student can use representations and models to communicate scientific phenomena and solve scientific problems.
2. The student can use mathematics appropriately.
3. The student can engage in scientific questioning to extend thinking or to guide investigations within the context of the AP course.
4. The student can plan and implement data collection strategies appropriate to a particular scientific question.
5. The student can perform data analysis and evaluation of evidence.
6. The student can work with scientific explanations and theories.
7. The student is able to connect and relate knowledge across various scales, concepts and representations in and across domains.

GRADE EVALUATION

- **Test, labs and other major grades 70%**
- **Daily assignments and homework 30%**

Unit tests will be a combination of multiple choice and free response essay type questions. All tests will be timed and given in AP-style format. Good notes taken during class and consistent study habits will assist you in being successful in this course and on your AP exam.

On occasion, take home free response essay questions will be assigned as a test grade. If absent, make up tests will be given immediately after school. You will need to schedule an appointment to take a make-up test. You have five school days to make up a test.

Tentative Schedule

First Week and Introduction to AP Biology

Big Ideas: 1 & 2

Source: Chapter 1

Unit Overview:

- The study of biology based on the principle of evolutionary change and the adaptations of species to their environment.
- Scientist make observations, form hypothesis and conduct experiments in an attempt to understand the principles of life.
- Form communities of organisms to individual cells, all life is based on atoms and molecules.

Unit 8 – Behavior and Ecology

Big Ideas: 1- 4

Chapters: 43-47

Unit Overview:

- Natural selection and coevolution have played a significant role in shaping the diversity found within ecosystems.
- Conservation biologist study many aspects of biology in order to determine how best to manage natural resources.
- Ecosystems consists of a complex web of interactions between individuals, species, communities and their environment.

Unit 3– Evolution

Big Ideas: 1, 3 & 4

Chapters: 15-19

Unit Overview:

- Support, with examples, the statement that “Darwin’s theory of evolution by natural selection is a unifying theory of biology.”
- Examine the methods by which scientist obtain evidence in support of evolutionary change.
- Analyze how evolution occurs at the molecular, organismal, and population levels of biology.

Unit 1 – The Cell

Big Ideas: 1,2,3,4

Chapters: 2 - 8

Unit Overview:

- Examine how inanimate elements can be combined to produce a living cell.
- Describe how science is used to investigate cellular phenomena.
- Evaluate how cellular components work together in order to function and live.

Unit 2– Genetic Basis of Life

BigIdeas:1,3 & 4

Chapters: 9-14

Unit Overview:

- Explain how the process of meiosis introduces the variation necessary for evolutionary change.
- Discuss how an understanding of cellular reproduction and molecular biology can be used to treat human disease.
- Evaluate how the information contained with the DNA is responsible for the physical characteristics of an organism.

Unit 4– Microbiology and Evolution

BigIdeas:1-4

Chapters: 20-22

Unit Overview:

- Recognize the evolutionary relationship of the microorganisms and their position in the tree of life.
- Exemplify how microorganisms are used as models in medical, environmental, and genetics research.
- Explain how microorganisms are essential for a healthy ecosystem.

Unit 5– Plant Evolution and Biology

BigIdeas:1-4

Chapters: 23-27

Unit Overview:

- Identifying the key structural innovations that occurred during the evolution of various plant groups.
- Explain how humans have manipulated plants to better serve our needs.
- Assess the unique adaptations of each group of plants that enable them to survive.

Unit 6– Animal Evolution and Diversity

BigIdeas:1-4

Chapters: 28-30

Unit Overview:

- Describe the position of humans in relation to the other animals in the tree of life.
- Explain why, from an evolutionary perspective, animal model organisms can be used in human biomedical research.
- Identify how the environment has shaped the evolution of the animal body plan.

Unit 7– Comparative Animal Biology

BigIdeas:1, 3 & 4

Chapters: 31-42

Unit Overview:

- Explain how various anatomical and physiological adaptations that have evolved in animals confer selective advantages.
- Analyze how specific scientific research studies are advancing our understanding of how animals systems function.
- Review the fundamental structures and functions that are uniquely found in animals.