



Ephrata High School  
Course Syllabus



AP Biology  
4301

### *I. Course Description*

AP Biology is designed to be the equivalent of a two-semester college biology course usually taken by biology majors during their freshman year. AP Biology is an *elective science course* for students who are highly motivated and have a strong interest in science. Major topics of study include biochemistry, cells, cellular energetics, genetics, evolution, classification, organism structure/function, and ecology. As in a college biology course, the AP Biology course is designed to have both a lecture and a lab component. Labs conducted by AP Biology students are the equivalent of those experienced by college biology students. At the completion of this course, students are expected to take the College Board's scheduled AP Biology exam in May. Some students may earn college credit if they achieve high enough marks on this exam. To assist students in their preparation for this test, the format of the assessments used throughout this course are similar to the AP Biology exam's assessments.

This course is fast-paced, intensive, and requires more at-home study time than the standard college-prep courses offered at the high school. The College Board determines AP course content and pacing website at: <http://www.collegeboard.com/student/testing/ap/about.html> .

### *II. Materials & Equipment*

**Textbook:** *Biology*, 8<sup>th</sup> Ed., Campbell, Reece, Mitchell. Pearson, 2008.

**Lab Manual:** *AP Biology Lab Manual* compiled by the College Board, 2001.

Lab materials will be provided by instructor. Students are required to have a binder, notebook, calculator, and bound marble notebook(for lab write ups). Access to a computer with Microsoft office is highly suggested.

### *III. Course Goals & Objectives*

Students will:

1. Experience problem solving and experimentation using the scientific method
2. Develop proficiency in skills for working in the laboratory.
3. Acquire a broad body of knowledge surrounding all facets of biology and the understanding of the biochemistry behind life.

### *IV. Course Topics (Summary Outline)*

- I. Molecules and Cells(25%)
  - A. Chemistry of Life (Chapter 1-5)
    1. Water
    2. Organic molecules in organisms
    3. Free energy changes
    4. Enzymes

- B. Cells (Chapters 6-7, 11-12)
  - 1. Prokaryotic and eukaryotic cells
  - 2. Membranes
  - 3. Subcellular organization
  - 4. Cell cycle and its regulation
- C. Cellular Energetics (Chapter 8-10)
  - 1. Coupled reactions
  - 2. Fermentation and cellular respiration
  - 3. Photosynthesis
- II. Heredity and Evolution (25%)
  - A. Heredity (Chapters 13-15)
    - 1. Meiosis and gametogenesis
    - 2. Eukaryotic chromosomes
    - 3. Inheritance patterns
  - B. Molecular Genetics (Chapters 16-21)
    - 1. RNA and DNA structure and function
    - 2. Gene regulation
    - 3. Mutation
    - 4. Viral structure and replication
    - 5. Nucleic acid technology and applications
  - C. Evolutionary Biology(Chapters 22-25)
    - 1. Early evolution of life
    - 2. Evidence of evolution
    - 3. Mechanisms of evolution
- III. Organisms and Populations(50%)
  - A. Diversity of Organisms (Chapters 26-32)
    - 1. Evolutionary patterns
    - 2. Survey the diversity of life
    - 3. Phylogenic classification
    - 4. Evolutionary relationships
  - B. Structure and Function of Plants and Animals (Chapters 35-51)
    - 1. Reproduction, growth and development
    - 2. Structural, physiological and behavioral adaptations
    - 3. Response to the environment
  - C. Ecology (Chapters 52-56)
    - 1. Populations
    - 2. Communications and ecosystems
    - 3. Global issues

#### *V. Assignments & Grading*

Approximately 60% Tests  
 20% Labs  
 15% Quizzes  
 5% Homework/Projects/Class Participation