

## AP Biology Syllabus 2024-2025

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**Exam Date:** Monday, May 5, 2025 @ 7:45 AM

### **Course Overview**

AP Biology is a college-level biology course offered to motivated and academically talented high school students nationwide. The focus of the AP Biology Curriculum is on four underlying principles, called Big Ideas, encompassing evolution; cellular processes and homeostasis; genetics and information transfer; and ecology and biological interactions. This course is designed to offer students a solid foundation in introductory college-level biology, emphasizing inquiry-based learning, and the development of science practices and skills. By structuring the course around the four big ideas, enduring understandings, and science practices, students are assisted in developing an appreciation for the study of life and help them identify and understand unifying principles within a diversified biological world.

Goals and objectives for students of the course include the following:

- Exhibit mastery of the major principles of biology
- Apply biological knowledge and critical thinking to environmental and social concerns
- Demonstrate skills in using various biological instrumentation and scientific methodologies
- Recognize science as a process and to practice finding and using patterns in collected data to solve scientific problems
- Create laboratory reports of labs performed throughout the year

### **Instructional Context**

AP Biology is taught to juniors and seniors at a high school that employs 43 minute periods on a six-day cycle. We meet with students five days a week for a single period and every other day for an extra lab period.

*Prerequisite:* Successful completion of Living Environment, Earth Science and Chemistry

*Recommendation:* Students should have scored an 85 or higher on the Biology and Chemistry Regents exams and earn grades of 90 or better in each.

*Prerequisite skills:* Basic algebra; how to collect, analyze, and interpret experimental data; basic concepts of probability and statistical analysis; graphing including setting axes and plotting data.

### **Instructional Resources**

Urry et al., *Campbell Biology*, AP<sup>®</sup> Edition, 11<sup>th</sup> Edition, 2018, Pearson.

### **Advanced Placement Biology Content**

The AP content is grounded in big ideas, which are crosscutting concepts that build conceptual understanding and spiral throughout the course.

#### **The Big Ideas:**

**Big idea 1: Evolution** - The process of evolution drives the diversity and unity of life.

**Big idea 2: Energetics** - Biological systems use energy and molecular building blocks to grow, to reproduce and to maintain dynamic homeostasis.

**Big idea 3: Information Storage and Transmission** - Living systems store, retrieve, transmit, and respond to information essential to life processes.

**Big idea 4: Systems Interactions** - Biological systems interact, and these systems and their interactions possess complex properties

### **Science Practices (SP)**

- 1) **Concept Explanation:** Explain biological concepts, processes, and models presented in written format.
- 2) **Visual Representations:** Analyze visual representations of biological concepts and processes.
- 3) **Questions and Methods:** Determine scientific questions and methods.
- 4) **Representing and Describing Data:** Represent and describe data.
- 5) **Statistical Tests and Data Analysis:** Perform statistical tests and mathematical calculations to analyze and interpret data.
- 6) **Argumentation:** Develop and justify scientific arguments using evidence.

## Units of Instruction

The course is organized into 8 major units, some units will be divided into two subunits. Each unit encompasses an average of three weeks to complete. The lab component comprises 25% of our allotted time.

Lecture and Lab schedule for the course is as follows:

Unit	Topic	Chapter Readings	Class Periods	Exam Weighting
1	<b>The Chemistry of Life</b>	2, 3, 4, 5	~5–7	8–11%
2	<b>Cell Structure and Function</b>	6, 7	~11–13	10–13%
3	<b>Cellular Energetics</b>	8, 9, 10	~14–17	12–16%
4	<b>Cell Communication and Cell Cycle</b>	11, 12, 43, 45, 48, 49	~9–11	10–15%
5	<b>Heredity</b>	13, 14, 15	~9–11	8–11%
6	<b>Gene Expression and Regulation</b>	16, 17, 18, 19, 20	~18–21	12–16%
7	<b>Natural Selection</b>	22, 23, 24, 26, 27	~20–23	13–20%
8	<b>Ecology</b>	<b>I:</b> 39, 40, 51 <b>II:</b> 52, 53, 54, 55, 56	~18–21	10–15%

## The Investigative Laboratory Component

The course is also structured around inquiry in the lab and the use of the seven science practices throughout the course. Students are given the opportunity to engage in student-directed laboratory investigations throughout the course for a minimum of 25% of instructional time. 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.

## Student Evaluation

Students are evaluated on their performance on the unit exams, quizzes, labs, classwork, projects/presentations, and the homework they complete. I assign a certain number of points for each assignment students complete for credit. Their final grade average is determined by the percentage of the total points earned during the reporting period.

Assignment	Percentage of Grade
Exams	60%
Quizzes & Projects	20%
Labs	15%
Homework & Classwork	5%
<i>TOTAL</i>	<i>100%</i>

## Format of AP Exam

### Section I: Multiple Choice

- 90 Minutes - 50% of Exam Score
- 60 Questions

### Section II: Free Response

- 90 Minutes - 50% of Exam Score
- 6 Questions
  - 2 Long Free-Response Questions
  - 4 Short Free Response Questions