

Advanced Placement Biology Course



Dalian Maple Leaf International School

AP Biology Course Outline



Introduction to Advanced Placement

The Advanced Placement Program will allow students to take college-level courses and earn college credit, advanced placement, or both, while still in high school. Students who earn a qualifying score on an AP Exam are typically eligible to receive college credit and/or placement into advanced courses in college.

Advanced Placement (AP) Biology : Course Description

AP Biology is a year-long course designed for high school students as an opportunity to earn AP credit on their high school transcript, as well as placement credit for an introductory college-level science course.

Students who earn a qualifying score on the AP Biology Exam are typically eligible to receive college credit and placement in an advanced science course in college.

This course is aligned to the College Board AP Biology Curriculum Framework and is based on four Big Ideas, which encompass core scientific principles, theories, and processes that cut across traditional boundaries and provide a broad way of thinking about living organisms and biological systems.

Twenty-five percent of instructional time is devoted to hands-on laboratory work with an emphasis on inquiry-based investigations. Investigations require students to ask questions, make observations and predictions, design experiments, analyze data, and construct arguments in a collaborative setting, where they direct and monitor their progress. This course is designed to prepare students for the Biology College Board Advanced Placement Exam.

Assessment

In Class Assessment	AP Exam (3 hour terminal exam in May)
Exam 50%	Section 1 (1.5 Hours) Multiple Choice
Quizzes/Assignments/Readings/Research 25%	Section 2 (1.5 Hours) Short and long free response
Labs 25%	

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Topics for the Course

The AP Biology Curriculum is framed around four Big Ideas. For each of these Big Ideas, there is a set of core concepts called Enduring Understanding, which will be used to guide the AP Biology course curriculum. Below is an outline of the AP Biology Curriculum Big Ideas and the Enduring Understandings topics covered in this course.

Big Ideas	Enduring Understanding
Unit One The process of evolution drives the diversity and unity of life.	<ul style="list-style-type: none">A. Change in the genetic makeup of a population over time is evolution.B. Organisms are linked by lines of descent from common ancestry.C. Life continues to evolve within a changing environment.D. The origin of living systems is explained by natural processes
Unit Two Biological systems utilize energy and molecular building blocks to grow, reproduce, and maintain homeostasis.	<ul style="list-style-type: none">A. Growth, reproduction, and maintenance of the organization of living systems require free energy and matter.B. Growth, reproduction, and dynamic homeostasis require that cells create and maintain internal environments that are different from their external environments.C. Organisms use feedback mechanisms to regulate growth and reproduction, and to maintain dynamic homeostasis.D. Growth and dynamic homeostasis of a biological system are influenced by changes in the system's environment. E. Many biological processes involved in growth, reproduction, and dynamic homeostasis include temporal regulation and coordination.
Unit Three Living systems retrieve, transmit, and respond to information essential to life processes.	<ul style="list-style-type: none">A. Heritable information provides for continuity of life.B. Expression of genetic information involves cellular and molecular mechanisms.C. The processing of genetic information is imperfect and is a source of genetic variation.D. Cells communicate by generating, transmitting, and receiving chemical signals.E. Transmission of information results in changes within and between biological systems.
Unit Four Biological systems interact and these interactions possess complex properties	<ul style="list-style-type: none">A. Interactions within biological systems lead to complex properties.B. Competition and cooperation are important aspects of biological systems.C. Naturally occurring diversity among and between components within biological systems affects interactions with the environment.

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Laboratory Practical Component

The laboratory experience is extremely important in the AP Biology course and is used to emphasize that biology and science is a process, which involves development and testing of a hypothesis, collection, analysis, and presentation of data with a clear discussion of the results.

The topics covered in these labs will be

Investigation 1: Artificial Selection
Investigation 2: Mathematical Modeling; Hardy-Weinberg
Investigation 3: Comparing DNA Sequences to Understand Evolutionary Relationship with BLAST
Investigation 4: Diffusion and Osmosis
Investigation 5: Photosynthesis
Investigation 6: Cellular Respiration
Investigation 7: Cell Division: Mitosis and Meiosis
Investigation 8: Biotechnology: Bacterial Transformation
Investigation 9: Biotechnology: Restriction Enzyme Analysis
Investigation 10: Energy Dynamics
Investigation 11: Transpiration
Investigation 12: Fruit Fly Behavior
Investigation 13: Enzyme Activity