

Course Syllabus

Description:

This course is designed to provide a college-level experience and prepare students for the AP exam in early May. Students will be provided with a foundation for developing an understanding for biological concepts through scientific inquiry, investigations, interactive experiences, higher-order thinking, real-world applications, writing analytical essays, statistical analysis, interpreting and collecting data. The key big ideas of the AP Biology course are system interactions, evolution, energetics, information storage, and transmission. Students will participate in a variety of engaging activities that enhance their mastery of biology concepts.

Note: This course meets one required science credit for high school graduation.

Credits: 1

Estimated Completion Time: 2 segments/32–36 weeks

Pre-Requisites:

Biology 1, Chemistry 1, and Algebra 1 recommended

Major Topics and Concepts

Segment 1

Module 01 – Chemistry of Life

Hydrogen Bonding

Properties of Water

Elements of Life

Biological Macromolecules

Structure and Function of Macromolecules

Module 02 – Cell Structure and Function

Cell Structure and Function

Cell Size

Membrane Transport

Facilitated Diffusion

Tonicity and Osmoregulation

Mechanism of Transport

Cell Compartmentalization

Module 03 – Cellular Energetics

Enzymes

Environmental Impacts on Enzymes

Cellular Energy

Energy Transfer

Photosynthesis

Cellular Respiration

Fitness

Segment 2

Module 04—Cell Communication and Cell Cycle

Cell Communication

Signal Transduction

Changes to Signal Transduction

Feedback

Cell Cycle

Regulation of Cell Cycle

Module 05—Heredity

Meiosis

Meiosis and Genetic Diversity

Mendelian Genetics

Non-Mendelian Genetics

Environmental Effects on Phenotype

Chromosomal Inheritance

Module 06—Gene Expression and Regulation

DNA and RNA Structure

Replication

Transcription and RNA Processing

Translation

Regulation of Gene Expression

Gene Expression and Cell Specialization

Mutations

Biotechnology

Module 07 – Natural Selection

Natural Selection

Artificial Selection

Population Genetics

Hardy-Weinberg Equilibrium

Phylogeny

Speciation and Extinction

Variation in Populations

Origins of Life

Module 08 – Ecology

Responses to the Environment

Energy Flow Through Ecosystems

Population Ecology

Effects of Density of Populations

Community Ecology

Biodiversity

Disruptions of Ecosystems

Course Assessment and Participation Requirements To achieve success, students are expected to submit work in each course weekly. Students can learn at their own pace; however, "any pace" still means that students must make progress in the course every week. To measure learning, students complete self-checks, practice lessons, multiple-choice questions, projects, discussion-based assessments, and discussions. Students are expected to maintain regular contact with teachers; the minimum requirement is monthly. When teachers, students, and parents work together, students are successful.



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