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.