



AP Biology Prep Course Syllabus

Welcome to the FlinnPREP™ AP Biology Online Prep Course! Your enrollment in this course is your first step towards a 5 on the AP Biology exam. FlinnPREP™ covers fundamental concepts in Biology using clear and concise text, vibrant images, practice examples, illustrative videos, engaging animations and end-of-unit summaries and assessments. All of the content is online, so an internet-enabled device is all you need. Take it with you anywhere this summer and be prepared for AP Biology this fall. The course is a primer, and if you stick with it, by the end you will feel confident walking into AP Biology. The following topics are covered:

Unit 1 – Fundamental Biology Skills and Knowledge

- Defining matter
- Water's properties
- The importance of pH to living organisms
- Carbon-based life and functional groups
- Understanding common prefixes, suffixes, and Latin roots

Unit 2 – Cells: Structure and Function

- Comparing and contrasting cell types
- Connecting eukaryotic organelles to function and processes
- Components of cell structure—the nucleus, cytoskeleton and cell size
- Cellular communication
- Structure and function of the cell membrane
- Transport across the cell membrane

Unit 3 – The Cell Cycle

- Cell cycle phases
- Mitosis
- Cell cycle control mechanisms and cancer
- Changes in DNA throughout the cycle
- Gene expression and cell types

Unit 4 – Meiosis: Heredity and Variation

- Chromosomes in gametes and somatic cells
- Meiosis
- Comparing and contrasting meiosis and mitosis
- Genetic variation through meiosis

AP Biology Prep Course Syllabus, Continued

Unit 5 – Mendelian and Molecular Genetics

- Mendelian laws of inheritance
- Monohybrid and dihybrid crosses
- DNA structure
- DNA replication
- DNA mutations and repairs
- From gene to protein: transcription and translation

Unit 6 – Evidence of Evolution

- Darwin's theory of evolution through natural selection
- Geologic and evolutionary timeline
- Using radiometric and relative dating to determine the fossil record
- Anatomical structures and molecular evidence
- Whale evolution case study
- Evidence of common ancestry and universal homologies
- Constructing phylogenetic trees to determine evolutionary relationships
- Direct evidence of evolution

Unit 7 – Evolution: Natural Selection

- Conditions for natural selection
- Genetic variation
- Overproduction of offspring
- Struggle for existence and differential survival and reproduction
- Sexual selection
- Artificial selection

Unit 8 – Evolution: Populations

- Microevolution in populations
- Hardy-Weinberg equilibrium conditions and calculations
- Determining if changes are adaptive or chance
- Genetic drift and gene flow
- Contributions to variation due to mutations
- Evolution of multi-gene traits
- Speciation: a case of reproductive isolation
- Ecological definition of a species; hybridization case study

AP Biology Prep Course Syllabus, Continued

Unit 9 – Interdependence in Ecosystems

- Abiotic and biotic factors in ecosystems
- The influence of climate on dominate communities
- Symbiotic relationships
- Predator-prey dynamics
- Impact of competition on individuals and populations
- Facilitation and succession
- Stability and disturbance
- Population dynamics
- Ecosystem health

Unit 10 – Ecology: Energy Flow and Nutrient Cycling

- Elemental components of living things
- Nitrogen cycle—nature’s predicament with an abundant element
- Carbon cycle
- Photosynthesis and respiration
- Energy transformation
- Energy transfer between trophic levels
- Bioaccumulation and biomagnification of toxins

For more information on this course, please contact the Flinn*PREP*™ team:

flinnprep@flinnsci.com

800-452-1261 (M – F; 7:30 am – 5:00 pm CT)