

Course Syllabus

Description:

This challenging course is designed to provide a college-level experience and prepare students for the AP exam in early May. Over two semesters, the students are engaged in a wide variety of activities, with substantial emphasis on interpreting and collecting data in virtual labs, writing analytical essays and mastering Biology concepts and connections. The key themes of the AP Biology course are: the scientific processes, the affects of science on technology and society, the chemistry and make up of living organisms, genetics, diversity, and evolution.

Throughout this course you will be expected to answer questions, reflect on issues and complete lab activities. The primary emphasis is to develop an understanding of concepts rather than memorizing terms and technical details. The course will successfully prepare you for the AP Exam in May.

Estimated Completion Time: 2 segments / 32-36 weeks

Major Topics and Concepts:

Segment 1

- Science as a Process
- Relationship of Structure to Function
- Energy Transfer
- Regulation
- Science
- Technology & Society
- Continuity and Change
- Evolution
- Interdependence in Nature
- Scientific method
- Basic chemistry
- Organic chemistry
- Polymerization
- Isomers
- Functional groups
- Biochemistry
- Properties of water
- Metabolism
- Enzymes
- Cell structure and function
- Cell processes
- Cell division
- Cell research including information on cancer cells, and gametogenesis
- Inheritance and genetics
- Mendel's work in genetics
- Statistical analysis of genetic information
- Non-Mendelian patterns of inheritance
- Nuclear processes, role of DNA and/or RNA in replication, transcription and translation
- Mutations and how these can be seen in populations
- DNA technology

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- Evolution
- Genetic drift and gene flow
- Mutations in populations
- Non-random mating
- Natural selection
- Hardy-Weinberg equilibrium
- Macroevolution

Segment 2

- Relationship of Structure to Function
- Continuity and Change
- Interdependence in Nature
- Evolution
- Energy Transfer
- Regulation
- Systematics
- Viruses, bacteria, and fungi
- Plant evolution and diversity
- Alternation of generations/plant life cycles
- Plant structure and function
- Plant growth and reproduction
- Plant nutrients and hormones
- Photosynthesis
- Phylogeny and animal diversity
- Transport in animal systems
- Immunology
- Osmoregulation
- Chemical regulation
- Reproduction and development
- Nervous system
- Muscular and skeletal system
- Levels of organization
- Biotic and abiotic factors
- Ecosystems, populations, and communities
- Symbiosis, food webs, and keystone predators
- Biogeochemical cycles in the environment

Course Assessment and Participation Requirements:

Besides engaging students in challenging curriculum, this course guides students to reflect on their learning and to evaluate their progress through a variety of assessments. Assessments can be in the form of work files, multiple choice questions, short answer questions, projects, essays, labs, oral assessments, and discussions. Instructors evaluate progress and provide interventions

through the variety of assessments built into a course, as well as through contact with the student in other venues.

In addition, the primary emphasis of this course is to develop an understanding of concepts rather than memorizing terms and technical details; with the ultimate goal of preparing students to successfully take the AP Biology examination offered in May.

