

a-g Biology

Course Description:

This is a course where emphasis is placed on the important concepts applicable to all living organisms and systems. Laboratory inquiry, field projects, demonstrations and course work should be designed to develop a thorough understanding of cellular biology, genetics, ecological relationships, chemistry of life, as well as an understanding of natural history in regards to both the animal and plant kingdoms (taxonomy).

It is strongly suggested that students take this course at the community college rather than through an independent study program in order to fulfill the University of California A-G requirement.

Prerequisite(s): Life Science

Length of Course: One year required for graduation

Year in School Taken: 9, 10

Course Objectives/Details:

The student should have a sound basis for understanding that:

the fundamental life processes of plants and animals depend on a variety of chemical reactions that are carried out in specialized areas of the organism's cells.

mutation and sexual reproduction lead to genetic variation in a population.

a multicellular organism develops from a single zygote, and its phenotype depends on its genotype, which is established at fertilization.

genes are a set of instructions, encoded in the DNA sequence of each organism that specify the sequence of amino acids in proteins characteristic of that organism.

the genetic composition of cells can be altered by incorporation of exogenous DNA into the cells.

stability in an ecosystem is a balance between competing effects.

the frequency of an allele in a gene pool of a population depends on many factors, and may be stable or unstable over time.

evolution is the result of genetic changes that occur in constantly changing environments.

as a result of the coordinated structures and functions of organ systems, the internal environment of the human body remains relatively stable (homeostatic), despite changes in the outside environment.

organisms have a variety of mechanisms to combat disease.

Course Topics:

Molecules and Cells
Chemistry of Life
Cells
Cellular Energetics

Heredity and Evolution

Heredity
Molecular Genetics
Evolutionary Biology

Organisms and Populations

Diversity of Organisms
Structure and Function of Plants and Animals
Ecology

Laboratory Assignments:

Diffusion and Osmosis
Enzyme Catalysis
Mitosis and Meiosis
Plant Pigments and Photosynthesis
Cell Respiration
Molecular Biology
Genetics of Organisms
Population Genetics and Evolution
Transpiration
Physiology of the Circulatory System
Animal Behavior
Dissolved Oxygen and Aquatic Primary Productivity

Methods for Evaluating Student Performance:

Evaluation of student performance is based on individual abilities, interests, and talents. Methods by which student progress is assessed will be through a variety and/or combination of methods. The methods available include but are not limited to the following:

Monthly review of work by education specialist (credentialed teacher),
Annual portfolios
Parent facilitator and education specialist observation
Student demonstrations,
Student grades,
Student work samples
Written examination
Research projects

Texts:

Biology: The Dynamics of Life, by National Geographic
Glencoe McGraw-Hill, 2000
ISBN: 0-02-828242-6
Biology: Living Systems, by Oram
Glencoe McGraw-Hill, 1998
0028263472

Biology: An Everyday Experience, by Kaskel, Hummer, and Daniel
Glencoe McGraw-Hill, 1999
ISBN: 0028256859

Biology: Discovering Life, by Miller and Levine
Houghton Mifflin Company, 1990
ISBN: 0669120081

Modern Biology, by Towle
Holt, Rinehart, and Winston, 1989
ISBN: 0030139198

Biology: Concepts and Applications, 8th edition
South Western Science, 1998
ISBN: 053450440X

Biology
Scott Foresman, Addison Wesley, Science and Health, 1996/1998
ISBN: 0805319573

Biology: Concepts and Connections
Scott Foresman, Addison Wesley, Science and Health, 1997
ISBN: 0805320229

Biology
Prentice Hall, Science and Health, 1998
ISBN: 0134342283

