



Department of Teaching & Learning
Parent/Student Course Information

Advanced Placement Biology

(SC 4340)

One credit, One year

Grades 11-12

Counselors are available to assist parents and students with course selections and career planning. Parents may arrange to meet with the counselor by calling the school's guidance department.

COURSE DESCRIPTION

Advanced Placement Biology is a college-level course that examines the principles of biology in detail. This course is designed in accord with the requirements of the College Board, and students are expected to take the Advanced Placement Biology Examination at the end of the course.

COURSE GOALS

- Develop knowledge of the facts, principles and processes of biology
- Develop an understanding of the means by which biological information is collected, how it is interpreted, how hypotheses are formulated from available data and how further predictions are made
- Develop an understanding that science is a human endeavor with social consequences

PREREQUISITE

Biology and Chemistry

OPTIONS FOR NEXT COURSE

Advanced Placement Environmental Science (Biology and Chemistry prerequisites)

Advanced Placement Chemistry (Chemistry prerequisite)

Advanced Placement Physics 1 (Algebra II/Trigonometry prerequisite)

Advanced Placement Physics C: Mechanics (Algebra II/Trigonometry and Calculus prerequisite)

Earth Science

Oceanography (Earth Science prerequisite)

Astronomy (Earth Science prerequisite)

Physics (Algebra II prerequisite or co-requisite)

REQUIRED TEXTBOOK

Campbell Biology in Focus, AP Edition, 1st Edition, Pearson Publishing (2014)*

MINIMUM REQUIREMENTS

- Read and outline assigned chapters in the textbook and/or answer the questions in the study guide
- Participate in the laboratory activities, prepare written laboratory reports and adhere to all safety procedures
- Read science journals, magazines and books to expand the ideas and topics presented in class
- Participate in simulated computer laboratory experiences
- Attend the extended class or laboratory sessions scheduled each week
- Demonstrate knowledge and understanding of all core objectives through laboratory investigations, projects, oral and/or written tests, quizzes and reports

- Conduct the required laboratory experiments identified by the Advanced Placement Biology Development Committee

The Knowledge, Skills and Attitudes that Comprise the Advanced Placement Biology Course are Summarized as Follows From the Prescribed Curriculum:

BIG IDEAS AND KNOWLEDGE

Big Idea 1: Evolution

- Natural Selection
- Biological Evolution
- Evidence for evolution
- Phylogenetic classification
- Evolutionary patterns
- Speciation and extinction

Big Idea 3: Genetics and Information Transfer

- Heritable information
- Mendelian genetics
- Molecular genetics
- Gene regulation
- Gene expression
- Cell communication

Big Idea 2: Cellular Processes; Energy and Communication

- Free energy changes
- Dynamic homeostasis
- Homeostatic mechanisms
- Cellular energetics

Big Idea 4: Interactions

- Population dynamics
- Subcellular organization
- Cooperative interactions
- Distributions of local and global ecosystems
- Environmental factors

LABORATORY EXPERIENCES

- Descriptive and experimental laboratory exercises are a required component of the Advanced Placement Biology course. A minimum of twenty-five percent (25%) of a student's time should be spent in laboratory investigations.
- The Advanced Placement Biology Development Committee has identified standard laboratories that are a required component of all AP Biology courses in the country. The required standard laboratories are listed below.

Big Idea 1: Evolution

Lab 1: Artificial Selection
 Lab 2: Mathematical Modeling: Hardy-Weinberg
 Lab 3: Comparing DNA Sequences to Understand Evolutionary Relationships with BLAST

Big Idea 3: Genetics and Information Transfer

Lab 7: Cell Division: Mitosis and Meiosis
 Lab 8: Biotechnology: Bacterial Transformation
 Lab 9: Biotechnology: Restriction Enzyme Analysis of DNA

Big Idea 2: Cellular Processes: Energy and Communication

Lab 4: Diffusion and Osmosis
 Lab 5: Photosynthesis
 Lab 6: Cellular Respiration

Big Idea 4: Interactions

Lab 10: Energy Dynamics
 Lab 11: Transpiration
 Lab 12: Fruit Fly Behavior
 Lab 13: Enzyme Activity

- In addition to the standard labs, students are required to participate in other laboratory investigations which reinforce and expand those facts, principles and concepts of general biology covered in lecture, reading and discussion. Computer simulated labs such as Bird Breed, Enzken and Flygen are included in these additional investigations.

NOTE: Students should keep records of their laboratory work in such a fashion that the reports can be readily reviewed. Some institutions want to see a record of the laboratory work done by an advanced placement student before making a decision about granting credit and/or placement in the biology program.

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Virginia Beach City Public Schools
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For further information please call (757) 263-1070.

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(Revised August 2017)