



# VIRGINIA BEACH CITY PUBLIC SCHOOLS CHARTING THE COURSE

## *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)

Physics (Geometry prerequisite)

Advanced Placement Physics 1 (Algebra II/Trigonometry corequisite)

Advanced Placement Physics C: Mechanics (Calculus corequisite)

Earth Science

Oceanography (Earth Science prerequisite)

Astronomy (Earth Science prerequisite)

#### **REQUIRED TEXTBOOK**

*Biology for AP<sup>®</sup> Courses*, OpenStax (2018)

#### **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 Idea 1: Evolution**

- The process of evolution drives the diversity and unity of life.

**Big Idea 2: Energetics**

- Biological systems use energy and molecular building blocks to grow, reproduce, and maintain dynamic homeostasis.

**Big Idea 3: Information Storage and Transmission**

- Living systems store, retrieve, transmit, and respond to information essential to life processes.

**Big Idea 4: Systems Interactions**

- Biological systems interact, and these systems and their interactions exhibit complex properties.

**LABORATORY EXPERIENCES**

- Inquiry-based investigations 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 13 student-directed, inquiry-based investigations that complement the curriculum framework. The investigations are listed below.

**Big Idea 1: Evolution**

Lab 1: Artificial Selection

Lab 2: Mathematical Modeling

Lab 3: Comparing DNA Sequences

**Big Idea 2: Energetics**

Lab 4: Diffusion and Osmosis

Lab 5: Photosynthesis

Lab 6: Cellular Respiration

**Big Idea 3: Information Storage and Transmission**

Lab 7: Cell Division: Mitosis and Meiosis

Lab 8: Biotechnology: Bacterial Transformation

Lab 9: Biotechnology: Restriction Enzyme Analysis of DNA

**Big Idea 4: Systems Interactions**

Lab 10: Energy Dynamics

Lab 11: Transpiration

Lab 12: Fruit Fly Behavior

Lab 13: Enzyme Activity

**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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Produced by the Department of Teaching and Learning.  
For further information, please call (757) 263-1070.

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