

AP Biology
Course Syllabus
2023 – 2024

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Course Philosophy:

The focus of this class is three-fold. First, students must learn that a firm understanding of the core concepts of biology is essential to life in the 21st century. Second, in order to succeed on the AP Exam and in the course, students must master a wide variety of test taking strategies and critical thinking skills. Lastly, students must be able to *apply* their biological knowledge and *use* their critical thinking skills to make a difference in their world.

Course Overview:

Class meets every day for 55 minutes. The course is structured around the four big ideas, the enduring understandings within the big ideas and the essential knowledge within the enduring understandings.

Big Idea 1: Evolution - The process of evolution drives the diversity and unity of life.

Big Idea 2: Energetics - Biological systems utilize free energy and molecular building blocks to grow, to reproduce and to 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.

In support of these, a portion of the class is spent completing student directed inquiry based laboratory exercises. In addition, many virtual labs and computer simulations will be utilized to further student understanding. These exercises and activities allow for the application of the six science practice skills and at least one (1) formal lab report will be required per term.

Science Practices

1. Concept Explanation: Explain biological concepts, processes, and models presented in written format.
2. Visual Representations: Analyze visual representations of biological concepts and processes.
3. Questions and Methods: Determine scientific questions and methods.
4. Representing and Describing Data: Represent and describe data.
5. Statistical Tests and Data Analysis: Perform statistical tests and mathematical calculations to analyze and interpret data.
6. Argumentation: Develop and justify scientific arguments using evidence.

YOU WILL NOT BE ABLE TO JUST “FLOAT” THROUGH THIS COURSE!
AP Biology requires a LARGE amount of personal drive and independent work!

In order to aide you in your work, you should design a personal schedule for the time required to complete reading and studying of the materials. Thus, the suggestions in this syllabus are meant to act as an instructional aide for you, the student, and not as a curriculum guide.

Assessment:

Progress in meeting the goals and expectations of AP will be assessed in a variety of ways. Examples of assessments include quizzes, lab reports, tests, projects, and PowerPoint presentations. Grades will be determined using the following breakdown:

Homework/In-Class Work/Class Participation	20%
Lab Reports/Projects	30%
Tests/Quizzes	50%

**ALL STUDENTS ENROLLED IN AP BIOLOGY
ARE REQUIRED TO TAKE THE AP EXAM IN MAY!!!!**

Section 1: 90 minutes to complete
50% of your score
Part A – 60 Multiple choice Questions

Section 2: 90 minutes to complete (first 10 minutes is a mandatory reading period)
50% of your score
2 Long Free Response Questions
4 Short Free Response Questions

*Students are allowed to use a calculator on the entire exam.

*Students will be supplied with a formula sheet as part of their testing materials.

Student Expectations:

This course will require a great deal of time and energy. Be prepared to work hard! I will expect the following things from you on a daily basis:

1. It is not unusual for students to be responsible for several levels of assignments at the same time. There will be regular (nightly) reading assignments, lab reports, chapter study guides, projects, practice exams, quizzes, tests, etc.
2. Students **MUST** learn to work **BOTH** independently and in a group! This is **NOT** an **OPTION!** You will be assessed regularly on your ability to collaborate!

3. Students must remain consistent throughout the year. It is **impossible** to “let it slide” for a few assignments and then “make it up” with a big push near the end of a term or semester. The entire class is built upon previous concepts. If you just “skated by” for chapter 7, you will not be able to “turn up” the level of commitment for Chapter 8 because you have not built a sturdy platform for your knowledge.

DO NOT FALL BEHIND!

4. With the pace of this class, attendance is obviously crucial to success. Missing one day of class, might mean missing 2 or 3 chapters! According to BHS rules, students will have # of days absent + 1 day for make up work. **OTHER THAN EXCUSED ABSENCES, NO LATE WORK ACCEPTED!**

Academic Honesty:

Each student is responsible for completing work independently of other students. Period. If you are caught cheating you will receive a zero for that assignment. I will call parents upon the very first offense and issue a disciplinary referral. Downloading essays from the internet, plagiarism and copying homework or essays from former and/or current students are all considered cheating. If you are unsure what constitutes cheating, ask. It is better to err on the side of caution.

Student Requirements:

You are required to have the following items for class:

- Electronic device with internet access
- Pencils and Pens
- Calculator

Instructional Resources:

- Textbook - Campbell, Neil A., and Jane B. Reece. *Biology*, 11th Edition. San Francisco, CA: Pearson Education, Inc. 2015.
- Microsoft Teams
- <http://apcentral.collegeboard.com/home>
- <http://bpsma.org/schools/brockton-high-school/academics/advanced-placement>

Recommended Materials:

- AP Exam Review Book

Course Outline/Timeline

The following lists the topics and chapters that correspond to each topic, as well as the approximate amount of class time that will be spent covering each topic. You can sign out a book or purchase a personal copy for yourself.

Unit 1: Chemistry of Life (8 days)

Chapter 3 – “Water and the Fitness of the Environment”

Chapter 4 – “Carbon and the Molecular Diversity of Life” (4.1 & 4.2)

Chapter 5 – “The Structure and Function of Large Biological Molecules”

Unit 2: Cell Structure and Function (14 days)

Chapter 6 – “A Tour of the Cell” (6.2-6.5)

Chapter 7 – “Membrane Structure and Function”

Chapter 36 – “Resource Acquisition and Transport in Vascular Plants” (36.2)

Unit 3: Cellular Energetics (18 days)

Chapter 8 – “An Introduction to Metabolism”

Chapter 9 – “Cellular Respiration: Harvesting Chemical Energy” (9.1-9.5)

Chapter 10 – “Photosynthesis” (10.1-10.3)

Unit 4: Cell Communication and Cell Cycle (12 days)

Chapter 1 – “Introduction: Themes in the Study of Life” (1.1)

Chapter 11 – “Cell Communication”

Chapter 12 – “The Cell Cycle”

Chapter 40 – “Basic Principles of Animal Form and Function” (40.2)

Unit 5: Heredity (12 days)

Chapter 13 – “Meiosis and Sexual Life Cycles”

Chapter 14 – “Mendel and the Gene Idea”

Chapter 15 – “The Chromosomal Basis of Inheritance”

Unit 6: Gene Expression and Regulation (22 days)

Chapter 16 – “The Molecular Basis of Inheritance” (16.1 & 16.2)

Chapter 17 – “From Gene to Protein” (17.1-17.5)

Chapter 18 – “Regulation of Gene Expression” (18.1-18.4)

Chapter 19 – “Viruses” (19.1 & 19.2)

Chapter 20 – “Biotechnology” (20.1 & 20.2)

Unit 7: Natural Selection (24 days)

Chapter 22 – “Descent with Modification: A Darwinian View of Life” (22.2 & 22.3)

Chapter 23 – “The Evolution of Populations”

Chapter 24 – “The Origin of Species”

Chapter 25 – “The History of Life on Earth” (25.1-25.5)

Chapter 26 – “Phylogeny and the Tree of Life” (26.1-26.3 & 26.6)

Chapter 27 – “Bacteria and Archaea” (27.1 & 27.2)

Unit 8: Ecology (22 days)

Chapter 40 – “Basic Principles of Animal Form and Function” (40.4)

Chapter 51 – “Animal Behavior”

Chapter 52 – “An Introduction to Ecology and the Biosphere” (52.2)

Chapter 53 – “Population Ecology”

Chapter 54 – “Community Ecology”

Chapter 55 – “Ecosystems”

Chapter 56 – “Conservation Biology and Global Change” (56.1 & 56.4)