

Advance Placement Biology Syllabus

A. Introduction

The course goal is to prepare each of you for the A.P. Exam that will be taken in May, and hopefully, you will earn college credit. My goal is to open your eyes to important information, new techniques, generally turn you on to the study of the world around you, and the relevance Biology has in your life. Throughout this class, you will develop analytical skills, be introduced to new laboratory techniques, and refine your written communication. The AP Biology Curriculum is framed around four big ideas:

1. The process of **evolution** drives the diversity and unity of life.
2. Biological systems utilize **energy** and molecular building blocks to grow, reproduce, and maintain homeostasis.
3. Living systems retrieve, transmit, and respond to **information** essential to life processes.
4. **Biological systems** interact, and these interactions possess complex properties.

Please be prepared to work harder than you ever have before in this class, but I hope that you develop a passion for the subject matter as well as discover a real world connection. It is my expectation that you come to class prepared each day (with reading and any daily work done before arrival) so you can be actively involved in classroom discussion.

B. Honor Code

Cheating will not be tolerated. Included in cheating is plagiarizing.

C. Course Description and Prerequisites:

The Advanced Placement Biology course is designed to be the equivalent of a *College Introductory Biology Course* taken by science majors during their first year. A college biology course differs significantly from the usual high school course in respect to the textbook used, the range and depths of topics covered, the laboratory work done by students, and the time and effort required. Again, each night you need to read the material which will be discussed in class the next day. Without this preparatory work, you will be unable to participate in class discussion which is essential to developing a deep conceptual connection with the material. Videos will be available on Edmodo or Google Classroom.

Students in AP Biology will only succeed if they appreciate that this course will be taught at the college level and will be very challenging. It is recommended that students be prepared to spend a minimum of 1 & ½ hours of study time per 1-hour class period. Students who do not wish to invest this type of effort should NOT enroll in AP Biology.

Students in class need to have taken biology and chemistry with a B average. It is strongly recommended that students also have taken physics. They also need to be hard workers ready for a challenge.

D. Grading Scale

Since the purpose of the AP Biology course is to prepare for the national exam, calculation of grades will be predominantly on exam and lab performance. Your grade will be a composite of the following areas:

Exams
Labs
Quizzes
Homework

E. Requirements

1. Textbook: Campbell and Reece, *Biology*. Benjamin Cummings. 9th Ed.
2. You will need to come prepared to class every day with reading/outlining done. A lecture class will include a mixture of PowerPoint lectures, discussion, and problem solving questions.
3. We will be doing AP labs as well as a few additional ones to help enhance your knowledge and understanding of the topics of the year. Students will be asked to answer analysis questions after all of the laboratories as well as graphing and manipulating data. For each of the AP labs, you may be asked to write a full lab report or poster presentation, take a pre-lab quiz, and take a post-lab quiz. Laboratory will give each of you the opportunity to learn new physical skills, learn to work in groups, find out how biology really works, and create student driven experiments. Students will learn proper measurement techniques. You will be given the laboratory instructions several days in advance so you can come prepared to work. You will find that on the AP labs, you will be required to “design your own experiment” in order to ask a question. This student-driven learning will carry over into other activities done in the classroom.
4. The non-laboratory classroom time will be a mixture of teacher lecture, student/teacher discussion, and practice in writing skills. Students will be given homework problems and other activities to help master the information. These problems will be worked in class if requested.
5. Tests will be designed to help you prepare for the format and timing of the AP exam.
6. On a quarterly basis, students will take a cumulative test to maintain prior topics. You may also be asked periodically to take vocabulary quizzes to keep terminology fresh in your mind.
7. During the spring semester, we will take a full length AP exam (possibly two) in order to better narrow down which topics are essential to review. They will also act as a measuring stick of where you are at that point.
8. The A.P. exam will be in mid-May. All students taking the class will have the opportunity to take the AP exam.
9. Other suggested materials include The Student Study Guide for Biology by Martha R. Taylor (Benjamin Cummings. 9th edition)

F. Missed Classes

- You will be expected to make up all missed homework and tests as soon as possible. I will expect you to check in with me the first day upon your return to school.
- If you have a pre-planned absence you are expected to notify me ahead of time. If a test or laboratory is missed, you may have to take it before leaving.
- Make up tests (different from those given on normal test day) will be given if test is taken on a day other than test day. I suggest you make every effort to be in class on test days.

G. Assignments and Laboratories

- All homework assignments will be due the day after we finish lecture on the topic. I recommend working on homework as you are doing your reading and outlining. After that time, homework will be accepted (with late points deducted) up until the test day. Materials turned in after that time will not be accepted.
- All laboratory reports, calculations, and follow up questions are due on the day assigned (no exceptions).
- Students need to be prepared to take a short quiz at the start of lab class to ensure they read it before coming to class. Students will also be given a short post-lab quiz the day which lab materials are submitted to the teacher.

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

Enduring understanding 1.A: Change in the genetic makeup of a population over time is evolution.

Enduring understanding 1.B: Organisms are linked by lines of descent from common ancestry.

See also: 3.A.1, 3.D.1, 2.B.3, 4.A.2

Enduring understanding 1.C: Life continues to evolve within a changing environment.

See also: 4.C.3

Enduring understanding 1.D: The origin of living systems is explained by natural processes.

See also: 4.A.1, 2.B.1

Big Idea 2: Biological systems utilize free energy and molecular building blocks to grow, to reproduce, and to maintain dynamic homeostasis.

Enduring understanding 2.A: Growth, reproduction and maintenance of the organization of living systems require free energy and matter.

See also 4.A.2

Enduring understanding 2.B: Growth, reproduction and dynamic homeostasis require that cells create and maintain internal environments that are different from their external environments.

See also: 4.A.1, 4.A.2

Enduring understanding 2.C: Organisms use feedback mechanisms to regulate growth and reproduction, and to maintain dynamic homeostasis.

Enduring understanding 2.D: Growth and dynamic homeostasis of a biological system are influenced by changes in the system's environment.

See also: 1.B.1, 4.A.5, 4.A.6

Enduring understanding 2.E: Many biological processes involved in growth, reproduction and dynamic homeostasis include temporal regulation and coordination.

See also: 2C2

Big Idea 3: Living systems store, retrieve, transmit, and respond to information essential to life processes.

Enduring understanding 3.A: Heritable information provides for continuity of life.

See also 3.C.2, 3.C.3, 4.A.1

Enduring understanding 3.B: Expression of genetic information involves cellular and molecular mechanisms.

Enduring understanding 3.C: The processing of genetic information is imperfect and is a source of genetic variation.

See also 1.A.2, 1.B.1, 1.B.3, 1.C.3, 3.A.1, 3.A.2, 3.A.3, 4.C.2, 4.C.3

Enduring understanding 3.D: Cells communicate by generating, transmitting and receiving chemical signals.

See also: 1.B.1, 2.D.4

Enduring understanding 3.E: Transmission of information results in changes within and between biological systems.

See also: 1.A.2

Big Idea 4: Biological systems interact, and these systems and their interactions possess complex properties.

Enduring understanding 4.A: Interactions within biological systems lead to complex properties.

See also: 1.D.1, 2.A.1, 2.A.2, 2.A.3, 2.B.1, 2.B.3, 2.D.1, 2.D.3, 3.A.1, 3.B.1, 3.B.2, 3.E.1, 3.E.3,

Enduring understanding 4.B: Competition and cooperation are important aspects of biological systems.

See also: 1.A.1, 1.A.2, 2.A.2, 3.D.3, 4.A.2

Enduring understanding 4.C: Naturally occurring diversity among and between components within biological systems affects interactions with the environment.

See also: 1.A.1, 1.A.2, 1.C.1, 2.B.1, 3.A.1, 3.A.4, 3.B.2, 3.C.1, 4.A.1, 4.A.2,

