

# Jackson County High School

## AP Biology Syllabus

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**Prerequisites:** Biology and Chemistry

**Text/Resources:** *Biology*, 7th Edition, Campbell & Reece (including student media CD)

Cambell, Neil A., and Jane B. Reece. *Biology*. 7th. San Francisco: Pearson Education Publishing, Inc., 2005.

AP Central Website: [apcentral.collegeboard.com](http://apcentral.collegeboard.com)

### Course Description:

The AP Biology course is designed to be the equivalent of a two-semester college introductory biology course usually taken by biology majors during their first year. You can expect to be challenged by the material and in turn will be expected to keep pace with a demanding schedule of reading assignments and out-of-class assignments. The two main goals of AP biology are to develop a conceptual framework for modern biology and to gain experience and appreciation of science as a process. The ongoing knowledge explosion in biology makes these goals even more challenging. Your primary emphasis in this course should be on developing an understanding of concepts rather than

on memorizing terms and technical details. Essential to this conceptual understanding are the following: a grasp of science as a process rather than an accumulation of facts; personal experience in scientific inquiry; recognition of unifying themes that integrate the major topics of biology; and application of biological knowledge and critical thinking to environmental and social concerns.

You can expect an immense amount of reading outside of class. Please work very hard to keep up with this reading; it will be a major key to your success. I would suggest using weekends for initial reading, saving weeknights for labs, study guides, re-reading, etc. The curriculum is presented by topic, and the number of chapters being covered at any given time varies. You will also be required to read all lab protocols prior to lab and complete some labs on your own. In addition to text reading, you will be assigned outlining, concept mapping, essay writing, lab report writing, study guides, article summaries, book reports, program summaries, etc.

As much work as it sounds like, I want you to know that you are really going to do some neat things and we are going to have a great time learning together! Remember that your true rewards will be in meeting the challenges, gaining the experiences, and enhancing your discipline for learning. You will also gain the conceptual framework, factual knowledge, and analytical skills necessary to deal critically with the rapidly changing science of biology. Some basic advantages of taking this course are listed as follows:

- (1.) An opportunity to take a course which will help the transition from the high school to university level work in biology.
- (2.) An increase in the probability of being accepted at most universities, since success in this course demonstrates the capacity to handle college work.
- (3.) Possible avoidance of much of the pressure of taking a first level biology course when taking other demanding courses at the collegiate level.

I commend you for signing up for this course. I know that most or all of you are taking multiple AP courses, are involved in extra-curricular activities, and have commitments and responsibilities beyond school. We will all work together to make this a great year!

### **Instructor Expectations:**

1. A record of excellent attendance. Since this will be a MUCH faster paced course any high school course, missing class will be a huge disadvantage. If you should be absent due to illness, please contact me so we can deal with the situation as efficiently as possible. Do not expect me to be sympathetic to your plight if you chronically miss school or come in late to this class.
2. Make certain that all assignments, reports, and evaluations are completed on time. No late work will be accepted unless extenuating circumstances exist in the opinion of the instructor.
3. There is a laboratory/recitation requirement for this class. Lab dates to be assigned.
4. Because of the nature of this course, any time you miss must be made up in an equivalent fashion. This includes missing school due to academic field trips, athletic trips, music trips, etc. You are responsible for any material missed.

### **Lab**

Successful completion of the laboratory is a requirement for this class. Laboratory based questions make up approximately 1/4 of the questions on the AP examination. Because of the nature of this course and the A.P. examination, laboratory topics will be subject to evaluation on quizzes, examinations, and assignments from time to

time. Late or missing lab reports or assignments will receive a grade of zero once they are one week past due. Labs submitted later than the due date will automatically lose 10 points in the interim.

**\*\* Projects:** When assigned, these will have varying evaluation weights which will be discussed at the introduction of the project.

**\*\* Changes:** in this evaluation scheme may be made at any time at the instructor's discretion.

## **Grading**

The school's grading scale will be followed. Nine week's grade will be based on the following distribution of grades.

**Exams: 60%**

**Daily Work/Homework: 20%** This will be an accumulation of in and out of class work, as well as laboratory based questions.

**Quizzes: 10%** Quizzes will include both lab and lecture. Two quizzes will be dropped each nine weeks.

**Labs: 10%** Lab grades will include pre-lab and lab write ups.

**Major Themes in AP Biology that will be covered throughout the year:**

- Science as a Process
- Evolution
- Energy Transfer
- Continuity of Change
- Relationship of Structure and Function
- Regulation
- Interdependence in Nature
- Science, Technology, and Society

1. Introduction: Ten Themes in the Study of Life

**Unit One: The Chemistry of Life**

2. The Chemical Context of Life
3. Water and the Fitness of the Environment
4. Carbon and the Molecular Diversity of Life
5. The Structure and Function of Macromolecules
6. An Introduction to Metabolism (AP Lab 2: Enzyme Catalyst)

## **Unit Two: The Cell**

7. A Tour of the Cell: organelle structure and function (Project: *Creating a Cell Analogy*)
8. Membrane Structure and Function (AP Lab 1: Diffusion and Osmosis)
9. Cellular Respiration: Harvesting Chemical Energy (AP Lab 5: Cell Respiration)
10. Photosynthesis (AP Lab 4: Plant Pigmentation and Photosynthesis)
11. Cell Communication
12. The Cell Cycle (AP Lab 3: Mitosis and Meiosis)

## **Unit Three: Genetics**

13. Meiosis and Sexual Life Cycles (Lab: Mitosis (Onion Root Tip))
14. Mendel and the Gene Idea (AP Lab 7: Genetics of Organisms)
15. The Chromosomal Basis of Inheritance
16. The Molecular Basis of Inheritance (AP Lab 6: Molecular Biology)
17. From Gene to Protein
18. Microbial Models: The Genetics of Viruses and Bacteria (Lab: Creating the structure of a virus, bacteriophage)
19. The Organization and Control of Eukaryotic Genomes
20. DNA Technology and Genomics
21. The Genetic Basis of Development

## **Unit Four: Mechanisms of Evolution**

22. Descent with Modification: A Darwinian View of Life (Project: *Inherit the Wind*)
23. The Evolution of Populations (AP Lab 8: Population Genetics and Evolution)

- 24.The Origin of Species
- 25.Phylogeny and Systematics

### **Unit Five: The Evolutionary History of Biological Diversity**

- 26.Early Earth and the Origin of Life
- 27.Prokaryotes and the Origins of Metabolic Diversity
- 28.The Origins of Eukaryotic Diversity
- 29.Plant Diversity I: How Plants Colonized Land
- 30.Plant Diversity II: The Evolution of Seed Plants
- 31. Fungi
- 32.Introduction to Animal Evolution
- 33.Invertebrates
- 34.Vertebrate Evolution and Diversity

### **Unit Six: Plant Form and Function**

- 35.Plant Structure and Growth
- 36.Transport in Plants (AP Lab 9: Transpiration)
- 37.Plant Nutrition
- 38.Plant Reproduction and Biotechnology
- 39.Plant Responses to Internal and External Signals

### **Unit Seven: Animal Form and Function**

- 40. An Introduction to Animal Structure and Function
- 41. Animal Nutrition
- 42. Circulation and Gas Exchange (AP Lab 10: Physiology of the Circulatory System)
- 43. The Body's Defenses
- 44. Regulating the Internal Environment
- 45. Chemical Signals in Animals Animal Reproduction
- 46. Animal Development (Lab: Chick Incubation)
- 47. Nervous Systems (Lab: Stimulus vs. Reaction)
- 48. Sensory and Motor Mechanisms

#### **Unit Eight: Ecology**

- 50. An Introduction to Ecology and the Biosphere
- 51. Behavioral Biology (AP Lab 11: Animal Behavior)
- 52. Population Ecology
- 53. Community Ecology
- 54. Ecosystems (AP Lab 12: Dissolved Oxygen and Aquatic Primary Productivity)
- 55. Conservation Biology

*The AP exam will occur on May 12 this year. We will spend the first weeks of May preparing and reviewing for the exam. You must take the AP exam to receive credit for this course.*