

**AP Biology 2008-2009**  
**Room D 206**  
**Russo**

**Office hours:** At lunch everyday in room D 206 or by appointment.

**Email:** jrusso@pvusd.net (this is how you should communicate with me outside of class or office hours).

**Website:** [www.aptoshs.net/~jrusso](http://www.aptoshs.net/~jrusso) (please bookmark my website)

**Text:** The text for this course is *Biology*, 7<sup>th</sup> ed., Campbell N. You will also be provided web based resources to support the text.

**Introduction**

Welcome to AP Biology! This is a college level biology course taught in high school. This is not an easy course, and the AP exam is very rigorous. Be prepared to work hard. This course covers a large amount of material and requires a serious commitment on your part.

As you know, there are three major rewards of taking an AP class. You get an extra point on your GPA. Depending on the college you plan to attend, 10 quarter units or 6 semester units can be worth up to \$5000. Finally, you will learn valuable skills and explore current research and changes in the field of biology. You are in this class because you understand the benefits it can bring you. You've chosen to be in this class, make the most of that decision.

Students must take the AP Biology exam in order to receive their weighted G.P.A. The Examination is 3 hours long. The exam consists of two sections:

Section I: 90 minute, 100 multiple-choice questions (60% of the exam score).

Section II 90 minute, 4 free response essay questions (40% of the exam score).

As a class we will be participating in multiple exam practice sessions.

Please be assured that I am here to help you. I am more of a coach than a judge. We share the same goals: to succeed on the test, learn intriguing science, and have fun in the process.

**Goals / Objectives**

The two main goals of AP Biology are to help students develop a conceptual framework for modern biology and to help students gain an appreciation of science as a process. The ongoing information explosion in biology makes these goals even more challenging. The primary emphasis in Advanced Placement Biology is 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 as 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.

## Course Description

AP biology covers a vast amount of material (which we will not be able to cover completely in class. **Our mantra is “Too much to do, too little time.”** Thus this class will make demands on even the most organized student. Personal responsibility is one key to success and a lot will be expected of you outside of class (reading, reviewing, researching etc). In addition to a thorough reading of an excellent college textbook (used currently in many colleges and universities), the content covered in this course will be supported with lecture, discussion, and other resources using various forms of multimedia. We will complete 12 “official” AP labs as well as many others. Many calculator based laboratories will be conducted to meet the requirements of the laboratories recommended by the College Board. We will also have substantial practice of both multiple choice and free response sections of the test. You will write up numerous laboratory reports, complete some activities in the computer lab, and you may also be expected to write several brief papers summarizing scientific articles, perform and pursue independent research via book reports, reading scientific journals, interacting with scientific professionals, and using the Internet. **In addition, outside reading will be assigned to help meet the goal of the 1,000,000 word challenge.** Enrolling in AP biology confirms that at the end of the year, you will take the AP Exam.

The course will consist of three general areas of study. They are:

- I. Molecules and Cells – 25 %
- II. Heredity and Evolution – 25 %
- III. Organisms and Populations – 50%

**Molecules and Cells** consists of the chemistry of life, cells, and cellular energetics. **Heredity and Evolution** consists of heredity, molecular genetics, and evolutionary biology. **Organisms and Populations** consists of the diversity of organisms, structure and function of plants and animals, and ecology.

*Topics* are the subject areas in biology. Photosynthesis would be considered a topic. *Concepts* are the most important ideas from our current understanding of a particular topic. The role of light in photosynthesis would be considered a concept. *Themes* are overarching features of biology that apply throughout the curriculum. There are several themes in biology and each theme can be recognized in several of the topics listed above. We will select several themes in class to focus on during the year. This will allow you to see that no part of biology is an island unto itself. There is an interdependence and interconnectedness at all levels of biology (ah, a theme!). This idea of themes will aid in your learning of biology and your ability to see the relevant and practical nature of it. Other major themes include:

<ul style="list-style-type: none"><li>• Science as a Process</li><li>• Interdependence in Nature</li><li>• Energy Transfer</li></ul>	<ul style="list-style-type: none"><li>• Science, Technology, and Society</li><li>• Continuity and Change</li><li>• Relationship of Structure to Function</li></ul>	<ul style="list-style-type: none"><li>• Regulation</li><li>• Evolution</li></ul>
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## **Course Outline**

At times the course will follow the sequence of topics outlined in the text. I will also attempt to integrate chapters from various units to reinforce the idea that no topic in biology is an island unto itself. It is important to recognize that concepts learned in one topic area in biology can be relevant and helpful toward a deeper understanding in others. Much like evolution's value as a foundation that binds together many seemingly disconnected biological disciplines.

## **FIRST SEMESTER**

### *Unit 1 - Ecology.*

Reading: Read chapters 50 – 55. Take detailed notes on each chapter.

Laboratory: AP Laboratories 11 (Animal Behavior) and AP Laboratory 12 (Dissolved Oxygen and Aquatic Primary Productivity) are conducted.

Guest speaker: Otter ecologist

Assessment: Ecology exam.

### *Unit 2 – Biochemistry*

Reading: Read chapters 2-5 and take detailed notes on these chapters.

Laboratory: Molecular Models will be used to build and covalently bond the building blocks of some classes of macromolecules. You will also investigate differences in the structure and function of monosaccharides.

Assessment: Biochemistry exam.

### *Unit 3 – Meeting Your Metabolic Needs*

Reading: Read chapters 8, 9, and 41. Take detailed notes on these chapters.

Laboratory: AP Laboratories 2 (Enzyme Catalysis) and 5 (Cellular Respiration) are conducted.

Assessment: Metabolism exam.

### *Unit 4 – The Cell, Cellular Transport, and the Immune System*

Reading: Read chapters 6, 7, and 43. Take detailed notes on these chapters.

Laboratory: AP Laboratory 1 (Diffusion and Osmosis) and Modeling Antibody Specificity are conducted.

Guest speaker: Evolution of the vertebrate immune system.

Assessment: Cells, cellular transport and cell specialization (immune system) exam.

### *Unit 5 – Cellular Communication in the Nervous and Endocrine Systems*

Reading: Read chapters 11, 45, 48, and 49. Take detailed notes on these chapters.

Laboratory: Variation in the sensitivity of sensory receptors.

Assessment: Cellular Communication exam

### *Unit 6 – Genetics I*

Reading: Read sections 5.5 (again) and 19.1. Read chapters 16 and 12. Take detailed notes on these sections and chapters.

Laboratory: DNA extraction and AP Laboratory 3A.

Assessment: Genetics I exam.

### *Unit 7 – Genetics II*

Reading: Read chapters 13, 14, 15, and 17. Take detailed notes on these chapters.

Laboratory: AP laboratory 3B, Amplification of *Alu* PV92 via the PCR, and the virtual fly lab (in lieu of AP Lab 7 – Genetics of Organisms) will be conducted.

Assessment: Genetics II exam.

### *Unit 8 – Genetics III*

Reading: Read chapters 18, 19, and 20. Take detailed notes on these chapters.

Laboratory: Amplification and sequencing of mtDNA and Transformation of *E. coli* using the pGLO plasmid will be conducted.

Guest Speaker: Goals for the Human Genome Project.

Assessment: Genetics III exam.

### *Unit 9 – Reproduction*

Reading: Read chapters 46, 21, and 47. Take detailed notes on these chapters.

Assessment: Reproduction exam.

## **SECOND SEMESTER**

### *Unit 10 – Biodiversity I*

Reading: Read chapters 25 – 28 (Systematics and Phylogeny, Origin of Life, Prokaryotes and Protists). Take detailed notes on these chapters.

Laboratory: Investigating *Volvox* and Surveying Local Protists.

Assessment: Biodiversity I exam.

### *Unit 11 – Biodiversity II*

Reading: Read chapters 31-34 (Fungi and Animal Diversity). Take detailed notes on these chapters.

Laboratory: Students will be assigned portions of these chapters to present to the class. The presentations will be dispersed accordingly through the middle of April. Rubrics and schedules will be posted.

Guest Speaker: Local mycology.

Assessment: Part of each presentation will include a 5 question multiple choice quiz. The sum total of your correct responses on the quizzes will count as your assessment for this unit.

*Unit 12 – Evolution*

Reading: Read Chapters 22-24. Take detailed notes on these chapters. Your million word challenge reading assignment, “The Journey of Man” will be assigned at this point in the semester.

Laboratory: Aligning Sequences for the Mitochondrial D-loop region (the first part of this laboratory – amplification of the mtDNA - will actually be conducted earlier at the beginning of the semester so that we can send the samples off for sequencing at Cold Spring Harbor Laboratory in New York). We will also investigate Hardy-Weinberg equilibrium using the results of our amplification of *Alu* PV92.

Assessment: Evolution exam.

*Unit 13 – Plants I*

Reading: Read chapters 35-37 and 10 (photosynthesis) and take detailed notes on these chapters.

Laboratory: AP lab 9 – Transpiration and AP lab 4 – Plant Pigments and Photosynthesis will be conducted.

Assessment: Plants I exam.

*Unit 14 – Plants II*

Reading: Read Chapters 38 and 39 and take detailed notes on these two chapters.

Laboratory: Angiosperm dissection.

Assessment: Plants II exam

*Unit 15 – Physiology*

Reading: Read chapters 40, 42, and 44. Take detailed notes on these chapters.

Laboratory: AP lab 10 – Physiology of the Circulatory System will be conducted.

Assessment: Physiology exam.

The actual dates for these units will be given as the semester progresses. The goal is to have covered the content for the course by the end of April in order to leave the first 10 days of May open for exam preparation.

**Assessment:** Students earn points for graded assignments. Student grades are based on the following breakdown (subject to modification).

<u>Quarter Grades</u>	<u>Final Exam Grades</u>	<u>Semester Grades</u>	<u>Grading Scale</u>
20% Laboratory reports	10% Semester Assn. ****	2/5 Quarter grade	90-100% A
20% Chapter Objectives	<u>90% Final exam</u> **	2/5 Quarter grade	80-89% B
20% Homework Quizzes*	<b>100% Total</b>	<u>1/5 Final exam</u>	70-79% C
40% Tests ***		<b>100% Total</b>	60-69% D
<b>100% Total</b>			59-0% F

\*The day after objectives or other assignments are given, you should expect a five question multiple choice quiz at the beginning of the next class. A running total of these quizzes will be kept throughout the quarter. **The total for these quizzes will not be curved.**

\*\*The class final will be taken before the AP exam (usually the last school day before the exam).

\*\*\* Tests and the final exam will be curved as needed. No other assignments are curved.

\*\*\*\*The semester assignments will be aligned with the 1,000,000 word challenge.

The AP Exam scores are not received until July. These scores are therefore not factored into your grade for this course.

**Attendance:** The School attendance policy will be in effect for tardies and unexcused absences. Please reacquaint yourself with it. Class attendance is critical to success in this class. Recall our mantra. If you are tardy or absent, your grade will suffer.

**Student conduct:** Exemplary student behavior is very important. Your classroom responsibilities include:

1. The use of academic language
2. Respecting others
3. Arrive to class ready to succeed
4. Taking care of the school environment

Failure to take these responsibilities seriously will result in calls home, conferences, Saturday school, etc..

Again, welcome to AP Biology!

Thanks,

Mr. Russo

Please review this with your parent/guardian and sign and date the bottom.

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AP student signature    Date

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AP Parent/Guardian signature    Date

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AP student (printed)

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AP Parent/Guardian (printed)