

**Advanced Placement Biology
2009-2010**

Contact Information:

E-mail: smiller@immaculateheart.org

Room:

SB4

Office Hours:

By appointment

Required Materials:

- Campbell, Neil A. et al. Biology. 7th Edition. Pearson Education, Inc., 2005.
- Taylor, Martha R. Student Study Guide for Biology. 7th Edition. Benjamin/Cummings, Inc., 2005.
- Three-ring binder with the following suggested sections: class notes, class handouts, graded assignments, lab handouts, homework and other materials
- Lab notebook with the following: table of contents and for each lab: title/number, observations, materials and methods, results/data, conclusions and other notes
- Appropriate writing utensils

Course Explanation:

Welcome to AP Biology! This AP Biology course is designed to be the equivalent of a college introductory biology course, usually taken by biology majors during their first year. After showing themselves to be qualified on the AP examination, some students, as college freshmen, are permitted to undertake upper-level biology courses or register in courses in which biology is a pre-requisite. Other students may have fulfilled a basic requirement for a laboratory-science course and will be able to undertake other courses to pursue their majors.

Throughout the year, we will be covering concepts that will help you build a conceptual framework for understanding modern biology, with an emphasis on:

- *an understanding of science as a process rather than an accumulation of facts*
- *recognition of evolution as the foundation of modern biological models and thought*
- *the integration of the general topics of biology through eight major themes*
- *applications of biological knowledge and critical thinking to environmental and social concerns*

This course will be challenging because of the fast pace and depth in which the material needs to be covered. If you need assistance or have any concerns please see me as soon as possible if your needs are not met in class.

All in all, I find that you will enjoy studying life in this class, despite the challenges that may arise.

Major Themes:

- I. Science as a process
- II. Evolution
- III. Energy transfer
- IV. Continuity and change
- V. Relationship of structure to function
- VI. Regulation
- VII. Interdependence in nature
- VIII. Science, technology and society

Curriculum Overview:

- I. *Molecules and Cells* (25%)
 - A. Chemistry of Life (7%) Chapters 3,4,5,8 (water, organic molecules in organisms, free energy changes, enzymes)
Lab: Enzyme Catalysis
 - B. Cells (10%) Chapters 6,7,12 (prokaryotic and eukaryotic cells, membranes, subcellular organization, cell cycle and its regulation)
Lab: Diffusion and Osmosis

- Lab: Molecular Biology
- C. Cellular Energetics (8%) Chapters 9,10 (couple reactions, fermentation and cellular respiration, photosynthesis)
Lab: Plant Pigment and Photosynthesis
Lab: Cell Respiration
- II. *Heredity and Evolution* (25%)
- A. Heredity (8%) Chapters 13,14,15 (meiosis and gametogenesis, eukaryotic chromosomes, inheritance patterns)
Lab: Mitosis and Meiosis
- B. Molecular Genetics (9%) Chapters 16,17,18,19,20 (RNA and DNA structure and function, gene regulation, viral structure and replication, nucleic acid technology and applications)
Lab: Genetics of Organisms
- C. Evolutionary Biology (8%) Chapters 22,23,24,26 (early evolution of life, evidence of evolution, mechanisms of evolution)
- III. *Organisms and Populations* (50%)
- A. Diversity of Organisms (8%) Chapters 25,27,28,29,30,31,32,33,34, (evolutionary patterns, survey of the diversity of life, phylogenetic classification, evolutionary relationships)
Lab: Population Genetics/Evolution
- B. Structure and Function of Plants and Animals (32%) Chapters 35,36,37,38,39,40,41,42,43,44,45,46,47,48,49 (reproduction, growth and development, structural, physiological and behavioral adaptations, response to environment)
Lab: Transpiration
Lab: Dissolved Oxygen/Primary Productivity
Lab: Physiology of the Circulatory System
- C. Ecology (10%) Chapters 51, 52,53,54,55 (population dynamics, communities and ecosystems, global issues)
Lab: Behavior

The laboratory investigations listed above for each section are the 12 labs recommended for AP Biology by the CollegeBoard. In addition to these labs, other lab activities may be done that pertain to the content (pGLO Genetic Transformation Lab, Animal Dissections, Carbonic Acid Investigations, Cladistics Activities, etc.)

NOTE: About 25% of our time together will be devoted to laboratory investigations.

Additionally we will spend some time discussing social, ethical and environmental implications of scientific study, where appropriate. Ideally each chapter in our text will bring to light some of these concerns that we will discuss as a class. Such topics may include cloning, genetic engineering, healthcare issues, cancer research, advancements in medical technology, deforestation and habitat destruction, meeting the supply and demand of a growing human population as resources become depleted, greenhouse gases and global warming, mass extinction, disease control, governmental support for scientific research, use of pesticides, forensics, and other various topics.

Students will:

- Take the AP Biology examination in May 2010
- Participate in all required AP labs.

Requirements:

Class time: Our class begins each day at 7:50 during first period. Due to the plethora of material that we need to cover for the AP exam, we will need to meet for additional time. Therefore I will begin the class period at 7:00 am on Tuesdays and Thursdays, which is 50 minutes earlier than school starts. Please be here everyday, because if you miss a class, you will be behind, and the more classes you miss the harder it is to catch up. In past years, I have found a direct correlation between absences/tardies and a student's inevitable score on the AP exam. Each day,

along with the extra 100 minutes per week will make a big difference in the amount of material that we cover throughout the year.

Homework: This will be assigned every night. In order to keep up with the material it is critical that you read the assigned parts of the chapters each night and do the problems associated with the text. Doing the required assignments will allow you to be prepared for lecture and other activities associated with the content. I also require you to make an outline or notes in some organized fashion that represents the material you have read. Homework will be checked regularly and when it is, you will earn points for completing all of it. Also, other assignments will be given that are applicable to the content (i.e., biological journals, news articles, magazine articles, etc).

Exams: There will be one at the end of every unit. Some units may have two exams if they are too long or complex. You must be present on the day of an exam. If you have an unexcused absence on the day of an exam, you will be automatically docked 10%. This class is supposed to prepare you for college, and a good number of classes at universities require students to be present for exams, and there are no opportunities for a makeup.

Labs: We will have laboratory investigations associated with each unit. Each one will directly pertain to the material that we have just covered. You will work in assigned pairs or groups depending on lab procedures and protocol. There are 12 labs recommended for AP Biology by the CollegeBoard, and we will do all of these laboratory investigations. In addition, we may do other laboratory investigations (as mentioned in the curriculum overview section). There will typically be lab components that we will do each week throughout the curriculum. It may be necessary to meet outside of class to complete some of the more complex and lengthy laboratory investigations. Missing a day of lab will be extremely detrimental! Please do your very best to be present on the days of laboratory investigations.

You are expected to keep a lab notebook that includes a table of contents and for each lab: title/number, observations, materials and methods, results/data, conclusions and other notes. Your lab notebooks will be checked after each lab and you will be required to write formal lab reports for laboratory investigations.

Lab safety is of the UTMOST importance. You are already familiar with the standard procedures and practices involved with lab work from your experiences in Biology and Chemistry. Safety precautions will include goggles, latex (or nitrile) gloves, and lab coats. Closed-toed shoes must be worn on days with labs. Also, under no circumstances will there be food or drinks in class on lab days. Please review the Lab Safety Contract on my website and return by the date I specify on the first day of classes.

Expectations:

Participation: Please participate! By asking questions (and answering them occasionally), you will learn so much more. Your input is a valuable component to the success of this class as a whole. Students who do not ask/answer questions in AP Biology typically are not as well prepared in May. I will take into account participation when I calculate the final grade.

Attendance: As I mentioned before, it is important that you show up for class everyday. We have a lot of material to cover and if you miss any class time, it will show in your exam and lab grades. When you miss a class, please take the initiative to check with me about the material you missed.

Tardies: You must arrive to class on time...and I do not mean running through the door as class is starting! You should be in your seat and ready to begin class every day. For each tardy, I will deduct one point from your participation grade, so plan ahead and get here on time in the morning!

GRADING:

Approximate point breakdown:

Exams: 100 points each

Lab Notebook: 20 points each time checked

Lab write-ups: 50 points each

Homework/Notes: 20 points for each time checked

Other assignments (lit reviews, class discussions, etc.): 20-25 points each

Final: 250-300 points each semester

Participation: 50 points each semester

Scale: The grading scale for AP Biology will be the same as the scale in the Student Handbook

A few more important things:

I expect you to be responsible, hardworking, excited and inquisitive. My responsibilities are to teach you the content and adequately prepare you for the AP exam. Your responsibilities are to learn and be actively engaged! Your learning is achieved by your positive and inquisitive attitude. I expect you to engage yourself in thought provoking discussion, ask questions and participate in all activities.

I do not tolerate lying, plagiarism or cheating. Please refer to your student handbook for more information on the consequences of such behavior.

Parent/Student Acknowledgement:

We, _____ (student) and _____
(parent/guardian) have read and acknowledge the rules and guidelines set forth in the AP Biology syllabus.

Student signature: _____ Date: _____

Parent/guardian signature: _____ Date: _____

Parent phone number: _____

Parent e-mail: _____

Please return by the date I specify on the first day of classes.