# A.P Biology Course Syllabus

**COURSE MATERIALS:**

Campbell, Reece, Mitchell, Taylor: *Biology- Concepts and Connections* fourth edition. Replacement cost $98.00 Three ring binder with paper, graph paper, calculator and access to Internet and word processor.
Recommended: Cliffs AP BIOLOGY Preparation Guide by Pack, Second Edition (ISBN 0-8220-2301-6) Available at most local book stores and internet book sellers.

**COURSE OVERVIEW:**

All homework assignments, lab reports, projects, problems, reviews will be given once and a due date will be established. I expect you to get the assignments and complete them on time. It is your responsibility to get any missed assignments and make up the work in a timely manner. Late homework- 50% credit if turned in the following day.

AP Biology is a laboratory course. Much of the learning in this course is acquired through independent laboratory investigations that require data collection using perishable materials. Labs will be conducted every week and will constitute at least 25% of the total time spent in class. Please make every effort to avoid missing class on lab days. Lab reports will require students to understand that science is a process that involves the thoughtful design of an experiment for the proper manipulation of variables, the careful collection of data and an accurate graphical representation of that data. Communication skills will be reinforced through the analysis and interpretation of the data.

Written assignments emphasizing the eight major themes from the AP Biology curriculum will be assigned weekly for homework that will require the student to do independent research using current periodicals including newspapers, magazines and scientific journals. These themes are: Science as a process, Evolution, Energy transfer, Continuity and change, Relationship of structure to function, Regulation, Interdependence in nature, and Science, Technology and Society)

**CONDUCT EXPECTATIONS:**

Be prepared to learn every day and demonstrate a commitment to excellence in all aspects of this course. To do this you should review class notes daily and read the text to preview the next day's material.
Contribute positively to the class and never interfere with the learning of others.
Study only Biology in Biology class.
Follow safety rules and guidelines as well as school rules; demonstrate respect and courtesy for others.
I reserve the right to assign seats.

**HONOR CODE:**

Do your own work to the best of your ability.

Claim nothing that is not your own effort.
Neither give nor receive test information on exam days.

**GRADING:**

Grading Scale: A = 90-100%; B = 80-89%; C = 70-79%; D = 60-69%; F = less than 60%
You are evaluated through weekly pop quizzes, unit exams (covering several chapters), lab reports, research projects, writing assignments and homework. Your grade is based on a point system. Your grade is determined by the percentage of the total points possible that you can earn in a grading period. I will calculate your grades approximately every two weeks and provide an update. There will be no extra credit or make-up tests for an improved grade.

## COURSE OUTLINE (approximate):

***All labs are from the college board Laboratory manual for students 2001.***

**Unit I Molecules and Cells**

**All organisms are composed of cells that are in turn composed of molecules. In this unit, students will investigate the relationship between the structure of molecules and cells and their function. Students will also investigate the evolutionary basis for the large variety of cells. Science and technology topics: solar power, water purification, nutritional guidelines, global warming and ozone depletion,**

Week 1 Pretest, biological themes, chemistry review, animal behavior lab (Lab 11). Regulation assignment: characteristics of water essay

Week 2 Biochemistry (focus on energy transfer) carbohydrates, lipids, proteins, nucleic acids, enzyme lab (Lab 2), Energy transfer assignment: organic compounds essay **Test I Chapters 1-4**

Week 3 Cell structure and function, diffusion and osmosis lab (Lab 1).

Week 4 Photosynthesis, plant pigments and photosynthesis lab (Lab 4).

Week 5 Cellular respiration, cellular respiration lab (Lab 5). Environmental concerns assignment: Interdependence in nature, Global warming and ozone depletion essay

Week 6 Photosynthesis and respiration continued **Test II Chapters 5-7**

**Unit II Heredity and Evolution**

**In this unit, students will investigate how within there can be continuity and change in living systems through the study of molecular genetics and inheritance. These processes are the basis of evolution, the unifying theme of biology. Science and technology topics: medicine, gene therapy, cloning, forensics and species survival plans.**

Week 7 Cell division. (binary fission, mitosis and meiosis) mitosis and meiosis lab (Lab 3) Assignment: internet karyotype activity.

Week 8 Introduction to genetics
Mendelian genetics, other inheritance patterns, human genetics, M+M Chi $^2$ activity, Assignment: Analysis of *Drosophila melanogaster* data from virtual fly lab (Alternative lab 7)

Week 9 Human genetics and DNA, RNA, protein synthesis, control of gene expression. Science as a process assignment: DNA discovery timeline project (requires internet access)

Week 10 Cloning and DNA technology**.** Alternative lab 6 Computer simulation of PCR, gel electrophoresis and DNA fingerprinting. Science, Technology and Society Assignment: DNA technology essay
**Test III Chapters 8-12**

Week 11 Evolution
Evidence, geologic time, macroevolution

Week 12 Evolution continued,
Darwin and modern synthesis, natural selection

Week 13 Evolution continued
Speciation, microevolution, Hardy-Weinberg population genetics lab (Lab 8), alternative classification systems (5 and 6 kingdom systems, 3 Domains) taxonomy, phylogeny and cladistics **Test IV Chapters 13-18**

**Unit III Organisms and Populations**

**In this unit, students will learn about interdependence in nature by studying how matter and energy flow through ecosystems and organisms and the evolution of those systems. Science and technology topics: agriculture, medicine, human population growth, introduced species, ecosystem change.**

Week 14 Ecology

The biosphere, Aquatic and terrestrial biomes, population structure and dynamics, life histories, human population demographics. Continuity and change assignment :Alternative strategies for evolutionary success, r vs k selection continuum (requires internet access).

Week 15 Ecology continued

Community structure, biogeochemical cycles, Ecosystem alteration. Productivity lab (Lab 12), **Test V Chapters 34-38**

Week 16 Fungi and Plants

Alternation of generations, evolutionary trends in plants, plant structure and function, plant hormones and tropisms. Transpiration lab (Lab 9) Relationship of structure to function assignment: Flower and mushroom dissection.

Week 17 Animals

Diversity( invertebrates vs vertebrates), evolutionary trends, comparative body systems.

Week 18 Human Body systems (emphasis on relationship of structure to function). Circulatory system lab (Lab 10). **Test Chapters 16-18**