

AP Biology Syllabus, 2017-2018

Textbook: *Principles of Life, for the AP® Course, Second Edition*, Sadava, et. al., 2, Bedford, Freeman and Worth Publishing Group

Course Description

This course covers the fundamental principles of biology. Topics reviewed include the chemical basis of life, molecular biology, cellular biology, metabolism, organismal physiology and form, ecology and evolution. The course will be taught as a flipped classroom, where students are responsible for readings, videos, etc. the previous night and apply concepts the following day. Students will be taught skills to support the development of critical thinking, writing and statistical analysis techniques.

The 4 Big Ideas

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

The 7 Science Practices

1. The student can use representations and models to communicate scientific phenomena and solve scientific problems.
2. The student can use mathematics appropriately.
3. The student can engage in scientific questioning to extend thinking or to guide investigations within the context of the AP course.
4. The student can plan and implement data collection strategies appropriate to a particular scientific question.
5. The student can perform data analysis and evaluation of evidence.
6. The student can work with scientific explanations and theories.
7. The student is able to connect and relate knowledge across various scales, concepts and representations in and across domains

ATTENDANCE

Attendance is mandatory in order to do well in class and on the AP Exam. Students are expected to attend class each day and arrive before the late bell sounds. Students who are absent are expected to obtain notes from a classmate and submit all missed classwork the following day. In the event the student is absent and homework was collected the student must hand the missed day homework directly to the instructor.

Notebooks: Separate bound notebook or section for this course, with date written for each day. AIM written, Do Now done, and everything written on board (and more!) written in your notebook. Many things covered in class are not found in the textbook; you must write it down. (Notebook checks and grades are mandatory for every science class.)

EXAMS

Students will take an examination at the end of each unit. Exams will include multiple choice and essay questions. All exams will be announced one week before the scheduled date. All make-ups are essay, unless you have a doctor's note. All others must have a note signed by parents. In most cases, if allowed at all, 2nd missed exam will receive a maximum score of 70.

Quizzes: No make-ups, as answers are released the next day. Absent students will receive a 0, with one lowest quiz grade dropped at end of semester for everyone.

Interactive notebook

All students are expected to have a spiral bound notebook that is brought to class each day. The notebook will be act as a repository for notes, from videos and readings, classwork and student generated questions.

Homework

Homework will be posted on Skedula. It is the student's responsibility to check for assignments on a daily basis. Assignments will include videos, readings and application questions. Assignments are due at the beginning of the class period, assignments collected at any other time will be treated as a late assignment. Students may submit work late however, each day late results in a 10% reduction on the assignment grade.

Labs

Laboratory exercises are a critical component of the course. Students are expected to complete laboratory assignments in a timely manner. All laboratory exercises will require students to complete and submit written answers. Students may work together but students should not copy from each other. Laboratory exercises are listed below in the course calendar.

Fall Semester Grading Rubric

Examinations and Quizzes	40%
Laboratory Assignments	20%
Classwork/HW	30%
Midyear Exam	10%

Spring Semester Grading Rubric

Examinations and Quizzes	40%
Laboratory Assignments	20%
Classwork/HW	30%
Final Exam Projects	10%

Week of	Number of Days	Topic	Lab
Sept. 4 - 8	2 xM, T, W	Introduction Pre-assessment Experimental Design	
Sept. 11 - 15	5	Evolution	The beaks of finches - graphing
Sept. 18 - 22	3 X R, F	Phylogenetics	Modeling Hardy Weinberg
Sept. 25 - 29	5	Chemistry	BLAST: Comparing DNA sequences
Oct. 2 - 6	5	Organic Molecules Metabolism	Chi-Square analysis: Coin flipping
Oct. 9 - 13	4 x M	Chemical Reactions AP for All Assessment 1 (2 days)	Designing experiments (Yeast Respiration)
Oct. 16 - 20	5	Enzymology Cell Structure and function	Beaks of finches (statistical analysis t-test)
Oct. 23 - 27	5	Cell signaling Cell respiration	Water Chemistry
Oct. 30 - Nov. 3	5	Cell Respiration	Enzyme Function
Nov. 6 - 10	4 x T	Photosynthesis	Diffusion & Osmosis
Nov. 13 - 17	5	Photosynthesis	Modeling cell signaling
Nov. 20 - 25	3 x R, F	Mendelian Genetics	Respiration
Nov. 27 - Dec. 1	5	Molecular Genetics	Artificial Selection Part 1

Dec. 4 - 8	5	Molecular Genetics	Photosynthesis Analysis
Dec. 11 - 15	5	Protein Synthesis	Artificial Selection Part 2
Dec. 18 - 22	5	Gene regulation	Using Genetic Crosses to analyze stickleback trait Chi square analysis
Dec. 25 - 29	HOLIDAY RECESS		
Jan. 1 - 5	4 x M	Gene regulation	Strawberry DNA
Jan. 8 - 12	5	Genetics of Virus/Bacteria	Modeling Regulatory switches of the PITX1 gene in stickleback fish
Jan. 15 - 19	4 x M	Biotechnology	Finals
Jan. 22 - 26	Regents Exam		
Jan. 30 - Feb. 3	4 xM	Mitosis and Meiosis	Investigation of Insulin
Feb. 6 - 10	5	Animal Reproduction	Restriction Enzyme
Feb. 13 - 17	5	Nervous system	pGLO transformation
Feb. 20 - 24	WINTER RECESS		
Feb. 27 - Mar. 3	5	Endocrine system	Mitosis & Meiosis
Mar. 6 - 10	5	Immune system	Karyotyping
Mar. 13 - 17	5	Digestion Muscle	Fruit Fly Behavior Chi square
Mar. 20 - 24	5	Respiratory	Blood typing and

		Circulation	comparison of cells of the immune system
Mar. 27 - 31	5	Plants	Energy Dynamics
Apr. 3 - 7	5	Ecology	Transpiration
Apr. 10 - 14	SPRING RECESS		
Apr. 17 - 21	3 x M, T	Ecology	Survival of the Sweetest
Apr. 24 - 28	5	Review	Population Growth Modeling
May 1 - 5	5	Review	Final
May 8 - 12	5	AP Exam Monday May 8 (8am) Final Projects and presentations	
May 15 - 19	5	Final Projects and presentations	
May 22 - 26	5	Final Projects and presentations	
May 29 - June 2	4 x M	Final Projects and presentations	
June 5 - 9	4 x R	Final Projects and presentations	
June 12 - 16	5	Final Projects and presentations	