

COURSE OVERVIEW AND EXPECTATIONS

Welcome to Advanced Placement Biology!!

The AP Biology course is designed to be the equivalent of a college introductory biology course usually taken by biology majors during their first year of college. This class is designed for students who have completed Biology and Chemistry with grades of “B” or better and who are contemplating a major in a science related field. Students can earn college credit by earning a 3 or higher on the AP Biology Exam given on Wednesday **May 10th, 2023**. The class will be conducted at the college level and students are expected to work accordingly. Students are expected to come to class prepared (all assignments complete), as the overall success of the program depends in large part on each student meeting their individual responsibilities. Meeting in study groups is highly recommended.

The goal of this class is not to just prepare you to do well on the AP Exam, but to open your eyes and minds to the world around you. We will explore the tiny parts of life through molecules and cells and see how organisms all work together in a large biosphere. Through this course I hope you can analyze your life to make healthy decisions for yourself and the planet on which you live. When this class is over, you will have a greater appreciation for how truly amazing life is.

TEXT BOOK

- *Biology in Focus 3rd ED* by Urry, Cain, Wasserman, Minorsky. Copyright: 2020
- Online textbook, animations, practice questions and more at www.pearson.com/mastering

MATERIALS REQUIRED

- 3-ring binder (I recommend a 1 or 1½ inch)
- Graph paper
- Internet access for online assignments in: Canvas, Mastering Biology, AP Classroom, Edpuzzle

GRADING

Quarter grades will be based on the points earned in these categories:

- Tests: 45%
- FRQs: 30%
- Homework: 15%
- Laboratory: 10%

Semester grades follow the county policy of 35% for quarter one, 35% for quarter two, and 30% for the semester exam.

LATE WORK & ABSENCES

Regular attendance is essential for success in all classes, but especially an AP level course. Since we only meet 50 minutes a day, **every** class is important. You will not have any “work days” or “catch-up days.” I will always be prepared to provide to you a thorough, meaningful lesson. I expect you to be mentally prepared and attentive for every class period. I do NOT want to see you working on work for other classes or looking at your phone during our class time.

If you are absent, it is your responsibility to get and complete make-up work. In general, you have two days for each excused absence to make up work. If you have an unexcused absence, or are not absent and just don't have your assignment done, you will receive a 10% deduction on your score for each day it is late.

WEEKLY OUTLINES

Please use the weekly outlines posted in Canvas (and on my LBHS staff page) to stay informed about homework assignments and upcoming assessments. This is a MUST DO if you are absent!

TESTS

Unit tests are very challenging and require in-depth knowledge and analysis of the material; rote memorization can only go so far. Since our goal is mastery, there will almost always be an opportunity for **test repair**. This involves coming in on your own time and fixing every incorrect answer on the test. For every question fixed, you will gain 1/3rd of a point toward your score. You have one week after the test date to make repairs.

SATURDAY LABS

With eight high level, inquiry-based labs to get through, there are 7 Saturdays that we will be coming in to do the really time-consuming labs. Plan on being here from 9:00 to 12:00.

If you cannot attend a Saturday lab, you must notify me ahead of time with a letter from a parent explaining why. You will then be given “fake data” to use for the lab analysis.

DATES FOR SATURDAY LABS (START TIME: 9AM):

09-17-22

10-08-22

10-29-22

11-19-22

02-25-23

03-25-23

04-15-23 *Conflicts with ACT

****REQUIRED Mock Exam: Saturday April 29th from 9:00 – 12:30****

THE LABORATORY

Laboratory assignments offer the opportunity for students to learn about problem solving, the scientific method, the techniques of research, and the use of scientific literature. You will write formal lab reports following the guidelines in the attached “**Lab Report Instructions.**”

The following is a list of our lab topics:

Hydrogen Bonding and Surface Tension	Cell Communication Taste Lab
Diffusion with Dialysis Bags	Molecular Biology (bacterial transformation)
Diffusion and Osmosis in Living Tissue	Molecular Biology (gel electrophoresis)
Enzyme Catalysis	Genetics of <i>Drosophila</i>
Plant Pigments and Photosynthesis	Population Genetics and Evolution
Factors that affect the rate of Cell Respiration	Factors that affect the rate of Transpiration
Mitosis and Meiosis with pop beads	Animal Behavior

AP EXAM FORMAT

The exam is three hours long and divided into two sections.

Section I: 60 Multiple Choice; 90 minutes = 50% of exam

Section II: Free Response; 90 minutes = 50% of exam

- a) 2 long FRQ questions: 8-10 points each (total of 18 points)
- b) 4 short FRQ questions: 4 points each (total of 16 points)

COURSE OUTLINE

<i>Unit</i>	<i>Sub-Topics</i>	<i>Biology in Focus Chapters</i>
Intro to AP Biology	<ul style="list-style-type: none"> • Summer “Assignment” Chemistry Review • Scientific Method: steps and controlled experiments 	1.3
1 – Chemistry of Life	<ul style="list-style-type: none"> • Atomic Structure and bonding • Properties of water • Acids and Bases • Functional Groups • Macromolecules • In depth analysis of chemistry behind structure and function of macromolecules 	2 3
Labs:	Drops on a Penny Statistics Lab POGIL – Protein Structure	
2 – Cell Structure and Function	<ul style="list-style-type: none"> • Prokaryotic vs Eukaryotic Cells • Organelle Structure and Function • Surface area to volume ratio • Membrane Structure and Function • Water Potential • Endosymbiosis 	4 5.1 – 5.5 32.4 25.1
Labs:	Diffusion and Osmosis in Living Tissue Diffusion using Dialysis Bags	
3 – Cellular Energetics	<ul style="list-style-type: none"> • Metabolism and Energy • Enzymes, Regulators and Inhibitors • Photosynthesis • Cellular Respiration • Fermentation 	6 - 8
Labs:	<ul style="list-style-type: none"> • POGIL – Cellular Respiration • Enzyme Catalysis • Plant Pigments and Photosynthesis • Cellular Respiration 	
4 – Cell Communication and Cell Cycle	<ul style="list-style-type: none"> • Signal Transduction Pathways • Feedback Mechanisms • Cell Cycle • Cancer 	5.6 32.3 9 16.3
Labs:	<ul style="list-style-type: none"> • POGIL – Signal Transduction Pathways • Cell Communication Taste Lab • Counting mitosis with onion root tips 	
5 – Heredity	<ul style="list-style-type: none"> • Meiosis • Inheritance Patterns (Mendelian Genetics) • Non-Mendelian Genetics • Genetic Disorders 	10 - 12
Labs:	<ul style="list-style-type: none"> • Mitosis and Meiosis Modeling with beads • Genetics of <i>Drosophila</i> 	

<i>Unit</i>	<i>Sub-Topics</i>	<i>Biology in Focus Chapters</i>
6 – Gene Expression and Regulation	<ul style="list-style-type: none"> • DNA and RNA structure and function • DNA replication • Protein Synthesis • Mutation • Gene Regulation and Expression • DNA Technology 	13 – 15 24.3
Labs:	<ul style="list-style-type: none"> • POGIL – Gene Expression • Bacterial Transformation • Gel Electrophoresis 	
7 – Evolutionary Biology	<ul style="list-style-type: none"> • History of evolutionary theories (Lamarck & Darwin) • Natural Selection • Evidence of Evolution • Population Genetics • Hardy-Weinberg Equilibrium • Mechanisms of evolution • Speciation (geographic and reproductive barriers) • Origin of Life • Phylogenetic Trees 	19 – 23 24.1
Labs:	<ul style="list-style-type: none"> • POGIL – Phylogenetic Trees • Population Genetics (Hardy-Weinberg Lab) 	
8 – Ecology	<ul style="list-style-type: none"> • Response to the environment • Ecosystems and Energy Flow • Nutrient cycles • Population Ecology • Community Ecology • Human Impact and environmental disruptions 	31.2 31.4 32.3 40.3 – 40.6 41 - 43
Labs:	<ul style="list-style-type: none"> • Animal Behavior – taxis vs kinesis • Transpiration Lab 	