

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 **May 14th, 2021**. 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 reading and assignments completed), 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)
- Some graph paper or a precision stylus to hand draw electronic graphs
- It is expected that you will have a mask and wear it appropriately at all times in class.
- Internet access and school issued Chromebook to access Google Classroom.
- You will also need to create an account in College Board’s platform called AP Classroom.

GRADING

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

Tests and quizzes: 40%

FRQs: 30%

Laboratory & homework: 30%

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

LATE WORK & ABSENCES

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 visit my staff page (found through Lemon Bay home page) to stay informed about homework assignments and upcoming assessments. These will also be posted in Google Classroom.

EXTRA SESSIONS

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.

Weekends – COVID Edition:

Under normal circumstances, this class includes Saturday Labs for the high level, inquiry-based labs required by College Board. Unfortunately, lab work doesn't follow the social distancing and material sharing guidelines for COVID prevention. This year, labs will be virtual until we're back to normal. I am still including weekend dates so you know which weekends you can expect a heavier workload. Since these are virtual, you will be able to do them from home, at your own pace.

DATES FOR WEEKEND VIRTUAL LABS:

10-10-20
10-31-20
11-21-20
12-12-20
02-13-21
04-10-21

****REQUIRED Mock Exam: Saturday April 17th from 9:00 – 12:30****

End of year cram sessions: We will have one or two optional cram sessions for additional review for the May 14th exam. Dates and times will be discussed and chosen as a class, but will be during the week of May 6 – May 13.

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 at least four formal lab reports, following the guidelines in the attached “**Lab Report Instructions.**”

The following is a list of our lab topics:

Diffusion and Osmosis	Genetics of <i>Drosophila</i>
Enzyme Catalysis	Origin of Life
Mitosis and Meiosis with pop beads	Population Genetics and Evolution
Plant Pigments and Photosynthesis	Transpiration
Cell Respiration	Animal Behavior
Molecular Biology (bacterial transformation)	Dissolved O ₂ and Aquatic Primary Productivity
Molecular Biology (gel electrophoresis)	

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

- 2 long FRQ questions: 8-10 points each (total of 18 points)
- 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 and 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
Activity:	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
Lab:	Diffusion and Osmosis	
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 • 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> 	
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 	

<i>Unit</i>	<i>Sub-Topics</i>	<i>Biology in Focus Chapters</i>
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 and Evolution (H-W 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 • Dissolved Oxygen and Aquatic Primary Productivity • Transpiration Lab 	