

Advanced Placement Biology Syllabus (2016-2017)

Mrs. Emily Shoultz

Room 227

Email: eshoultz@jcboe.net

Website: shoultzscience.wikispaces.com

Twitter: @shoultzscience

Planning: Fall-9:55-11:30; Spring- 11:36-1:36

Course Description:

AP Biology is designed to be the equivalent of a college introductory biology course usually taken by biology majors during their first year. Students may take the AP Biology course after the successful completion of a course in high school biology and one in high school chemistry.

The course content follows a traditional timeline all the while focusing on the four Big Ideas and the Enduring Understandings identified in the Curriculum Framework published by the College Board. We will follow a micro to macro theme, starting with biomolecules and moving to cell structure. This is followed by a systematic study of cellular organelles as we look at cellular homeostasis, cellular energetics, and the cell cycle. Mendelian genetics follows, which will flow into a hefty unit of molecular genetics culminating in the truly unifying theme to all life science - Evolution. We then move into organismal homeostasis, multicellular molecular signaling, developmental biology, ecology and animal behavior – which we can now look from a truly evolutionary standpoint. The year finishes up as we tie in all content into the major themes of the course. The Big Ideas are woven into the treatment of the course material at appropriate points all year. Required readings by the students will include the use of their textbook with some guided reading question sets and the occasional outside reading from popular current science.

Text:

Biology 9th Edition By Sylvia Mader

Supplies:

Lecture Binder (3 ring binder w/dividers for handouts); 4 function calculator with square root key.

Fee:

There is a \$40 lab fee for this course.

Course Requirements:

Students are required to participate in laboratory activities.

Students are required to keep a lab notebook.

Students are required to complete reading assignments at home.

Students are required to complete some assignments using a computer and internet connection.

Students are required to take the AP Biology exam Monday, May 8th, 2017.

Grading:

This course will be graded on a points system. Exams are worth 80-100 points. Lab reports are worth 100 points. Classwork and homework are worth 10-25 points.

Attendance:

This class meets for one block every day for the entire school year. Class periods will be composed of lecture, labs, quizzes, and exams. A premium will be put on labs and essay composition. Each unit exam will model the AP Biology Exam with multiple choice questions, free-response (essay) questions – both long and short – and math grid-in problem sets.

This course will move at a very fast pace, with labs, lectures and reviews. Because class sessions will introduce new material, allow time for questions, and include special instructions, there is really no way to make up a missed class or most of the labs. It is, therefore, essential that the student make a conscientious effort to attend every class and be prepared to participate.

In the event of an absence, please refer to the class website for materials and check the pink bin on the front table for a daily log. Students should schedule make-up work immediately upon their return from an absence.

Homework:

Textbook Reading: Very Important. Read the assigned chapters/sections nightly and take notes - like a college student. Stay up to date to be prepared for class.

HW Assignments: Besides the reading, you will have to complete reinforcement assignments and lab exercises. You should be working on these as we work through each chapter using both the text and lectures from class. You will have quizzes on the reading sets.

Lab Assignments: The main source of written work outside of class. This will be in addition to the regular readings and homework.

AP Exam:

The exam will determine whether or not you are eligible to receive college credit for this course. The AP exam for this current year will be on Monday, May 8th, 2017. The fee for the exam is \$89*. The format for this is a 90-minute, 63 multiple-choice/grid-in section and a 90-minute free response section. Exam grades are based on a scale of 1-5 (qualifying scores are considered 3 or better). Results will be available to you in July 2017, so this will not be factored into your course grade. For more information on the course, exam, and its scoring, visit:

www.collegeboard.com

Application of the Science Practices Throughout the Course:

As an inquiry-based learning course, AP Biology is organized to give students a basic understanding of each concept to be studied, and then have the student first conduct teacher-directed activities to experience a science practice before conducting their own student-directed experiments. We will include most, if not all, of the 13 student-directed investigations as published in the “AP Biology Investigative Labs: An Inquiry-Based Approach” along with many other activities that should get students excited to carry out experiments that answer questions that they ask themselves throughout the year.

The Big Ideas:

The big ideas are interrelated, and they will not be taught alone. The course will connect these big ideas along with their associated enduring understandings throughout the year. College Board provides the scope and sequence of the course in a document at the following link: <https://secure-media.collegeboard.org/digitalServices/pdf/ap/ap-biology-course-and-exam-description.pdf>

Big idea 1: The process of evolution drives the diversity and unity of life.

Big idea 2: Biological systems utilize free energy and molecular building blocks to grow, to reproduce and to maintain dynamic homeostasis.

Big idea 3: Living systems store, retrieve, transmit and respond to information essential to life processes.

Big idea 4: Biological systems interact, and these systems and their interactions possess complex properties.

Academic and Behavioral Expectations:

At all times students are expected to follow classroom and school rules, behave in a responsible and mature manner, and conduct themselves with honor and integrity. Students are expected to do their own work. Plagiarism and cheating will not be tolerated. Cheating is taking someone else's work and submitting it as your own. Students should avoid cheating or the **appearance of cheating** at all times. Cheating will result in a zero. On a case by case basis, the teacher may allow a substitute assignment for **half or ¾ credit. Do not ask an old student to 'borrow' their old Biology material.** If students cut and paste from the internet, copy from someone else work, or work together with a partner or groups, **this must be referenced, cited or noted on the assignment.** **If not, it is cheating or gives the appearance of cheating and is subject to discipline. Preserve your integrity and reputation. Submit your own work and avoid the appearance of cheating.**

Late Work:

Late work will not be accepted for full credit. Late assignments will receive a twenty percent reduction of the total points for the grade earned. After 5 school days, the assignment will not be accepted and will receive a zero.

Extra Help:

I am available on Wednesdays and Thursdays after school from 3:30-4:30 and by appointment before or after school. I am also available through email and Twitter for any questions. My website will have resources to aid you in your studies.

Do's and Don'ts for AP Biology Free Response Questions:

Writing is an important skill that is required in this class. Both in lab reports and on class exams (including the Part II free-response questions on the AP Exam), you need to articulate your thoughts onto paper. The lab format will be described later on, but on all exams and other class assignments, you need to be able to compose your thoughts clearly and concisely. Below are a couple of guidelines that you should follow which should lead towards success in the written portion of the class.

DO:

- Read the question **twice** before answering, and **once** after answering.
- Outline the answer to avoid confusion and disorganization. Thinking ahead helps to avoid scratch-outs, skipping around, and rambling.
- Define any term that you use.
- Answer the parts of the question in the order called for. It is best to not skip around.
- Write clearly and neatly. Unreadable answers are never given any credit.
- Go into detail on the subject, and to the point.
- **ANSWER the question THOROUGHLY!**
- If you cannot remember a word exactly, take a shot at it – get as close as you can. If you don't have a name for a concept, describe the concept.
- Use a black ball point pen.
- Remember that no detail is too small to be included, as long as it is to the point.
- If you draw a diagram, carefully label it (otherwise it gets no points) and place them in the text at the appropriate place, not detached at the end.
- Bring a watch to the exam so that you can pace yourself. You have two long essays (22 minutes each) and 6 short essays (about 6 minutes each).
- Understand that the exam is written to be hard – the average score on the essays are usually between 2 and 5 points. It is very likely that you will not know everything, so relax and do your best.

DON'T:

- Don't waste time on background information unless the question calls for historical development or historical significance. **Just answer the question!**
- Don't ramble, get to the point!
- Don't shoot the bull – say what you know and go on to the next question. You can always come back if you remember something.
- Don't use pencil or an ink color other than black.
- Don't panic or get angry because you are unfamiliar with the question. You probably have read or heard something about the question – be calm and think.
- Don't scratch out excessively. One or two lines through the unwanted words is sufficient.
- Don't write words in the margins unless it is necessary.
- Don't worry about spelling a word exactly or using perfect grammar. These are not a part of the standards that the graders use.
- Don't write sloppily. It is easier for a grader to miss an important word when he/she cannot read your handwriting.
- Don't write introductory or closing paragraphs. This is not an English essay, it is an answer to a question.
- Don't leave questions blank. Make *some* effort on every question.

Topics	Chapters	Time	Labs/Activities
Unit 1- Science as a process	1- A View of Life	8 days	Scientific Measurements, Termite Inquiry Lab
Unit 2- Biochemistry	2- Basic Chemistry 3- The Chemistry of Organic Molecules	10 days	Water Modeling Proteins Activity Testing for Biomolecules pH and Buffer Labs
Unit 3- Cells	4- Cell Structure and Function 20.2-4- Bacteria and Archaea 21- Protist Evolution and Diversity 5- Membrane Structure and Function 6- Metabolism: Energy and Enzymes	12 days	Cell structure and ID Enzyme activity lab Toothpickase Diffusion and Osmosis Lab Membrane model Microscope Lab- Pond Water
Unit 4- Energy	7- Photosynthesis 8- Cellular Respiration	12 days	Photosynthesis Lab Cellular Respiration Lab Fermentation Lab
Unit 5- Communication and Division	9- The Cell Cycle and Cellular Reproduction 10- Meiosis and Sexual Reproduction 27- Flowering Plants Reproduction	11 days	Cell to cell communication Mitosis and Meiosis Lab (Sordaria) Cancer Presentations Mitosis Microscope Lab
Unit 6- Heredity	11- Mendelian Patterns of Genetics	14 days	Fast Plants Genetic Disorder Presentation Solving genetic problems Chi Square
Unit 7- Molecular Genetics and Biotechnology	12- Molecular Biology of the Gene 13- Regulation of Gene Expression 14- Biotechnology and Genomics 20.1- Viruses, Viroid, and Prions	16 days	Gel Electrophoresis Lab Transformation Lab Lac Operon Model Bioethics Discussion DNA Replication
Unit 8- Evolution	15- Darwin and Evolution 16- How Populations Evolve 17- Speciation and Macroevolution 18- Origin and History of Life 19- Taxonomy, Systematics, and Phylogeny	18 days	Hardy Weinberg Greeb Greeb Cladograms Fast Plants
Unit 9- Botany	23- Plant Evolution and Diversity 24- Flowering Plants: Structure and Organization 25- Flowering Plants: Nutrition and Transport	5 days	Transpiration

	26- Flowering Plants: Control of Growth Responses		
Unit 10- Animal Diversity	28- Invertebrate Evolution 29- Vertebrate Evolution 30- Human Evolution	5 days	
Unit 11- Comparative Animal Biology	31- Animal Organization and Homeostasis 32- Circulation and Cardiovascular Systems 33- The Lymphatic and Immune Responses 34- Digestive Systems and Nutrition 35- Respiratory Systems 36- Body Fluid Regulation and Excretory Systems 37- Neurons and Nervous Systems 38- Sense Organs 39- Locomotion and Support Systems 40- Hormones and Endocrine System 41- Reproductive Systems 42- Animal Development	16 days	
Unit 12- Ecology	43- Behavioral Ecology 44- Population Ecology 45- Community and Ecosystem Ecology 46- Major Ecosystems of the Biosphere 47- Conservation of Biodiversity	10 days	Pill Bug Behavior Predator/Prey Relationships Biome Ads