Advanced Placement Biology 2022-2023 Course Syllabus

Objective: The objective of this course is to provide high school student with the opportunity to pursue and obtain credit for college level work in biology. At the conclusion of this course students should be able to demonstrate a firm grasp of biological concepts and laboratory techniques. Factual knowledge is a part of this course however; the emphasis is placed on the ever changing nature of science. Science is a process of investigation and communication. *Students are expected to analyze data and draw conclusions based on their investigations into biological topics.*

Course Description: It is our expectation that students receive an experience in AP biology equivalent to that of a college or university biology course – complete with lab work. Students will be asked to perform college-level work and be assessed in a like manner. The development of critical and independent thinking will be emphasized. Biology is a dynamic and ever-changing field of study. There is much to explore in a seemingly short school year. Discussion is an important part of the course. Discussions and reflections are essential to learning the complex themes within AP biology. For this reason, attendance is critical for success. Hands on activities are also a staple of the course. Most students learn through experiencing activities that are relevant to the material. Reading in the text is very important in order to relate discussions and labs to the material being covered. All students are encouraged to read the chapters to be covered ahead of the discussions so that they are able to be active participants. Students also learn through their creative writing abilities. Periodic abstracts on topics that lend themselves to understanding complex concepts within the course are required. See detailed comments about labs and abstracts below.

Instructor:

Course Text:

Campbell Biology (11th edition).
ISBNISBN-13: 978-0134093413 /ISBN-10: 0134093410

Supplemental Books:

AP Test Prep Series – Pearson Education - $ 15
Student Study Guide – Campbell 8th Edition - $ 24
5 Steps to a 5 – to be purchased on your own
Novel: The Immortal Life of Henrietta Lacks by Rebecca Skloot

Materials:

1. 2, Three ring binders (1.5- 2" each)
2. College ruled loose leaf paper
3. Dividers (5 tabs)
4. 1 Subject Spiral notebook (70 pgs.)
5. Pens (**blue or black ink only**)
6. Pencils
7. High lighters
8. Lineless 8 ½ x 11 paper
9. Planner or Agenda
10. Note cards (recommended)
11. Flash drive/thumb drive

Course Overview:

This AP biology course is organized around 4 Big Ideas:
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.
AP Biology students are expected to engage in the science process as scientists would. The following science practices will be integrated throughout the course and assessed on the AP exam.

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

Grading Scale:

A = 90-100
B = 80-89
C = 74-79
D = 70-73
F = below 70

Assessments (May include, but not limited to Tests, Projects, Labs, and Lab Practicum's): 4**0%**
A major test is given at the end of each unit. The format of these tests follows the AP exam. Each test consists of multiple choice questions and free response questions (short answer & essay type questions).

Class Work (May include, but not limited to class work, abstracts, activating strategies, and quizzes)**: 40%**

****Final Exam: 20%** (A comprehensive exam is given at the end of each semester. The format of this exam follows the AP exam and provided by Henry County Schools.)

Abstracts:

In order to make connections between our studies and current scientific information, including relevant social and ethical issues, we will read and abstract articles written within the last six months. An abstract is a summary or synopsis of an article in a journal or magazine. During each semester you will abstract several articles that apply to topics covered during that semester. Topics should correspond to unit of study. **Due Dates: TBA on the first day of class.** See details on abstract guidelines.

Labs:
Investigative labs are an important component of the AP Biology course. At least 25% of class time will be spent conducting laboratory investigations. Students are required to keep a lab notebook of all lab activities. Several inquiry style labs will be completed for each curricular big idea.
It is very important for students to learn how to communicate laboratory experiences. Students will learn to do so through the lab journal, formal lab reports, poster sessions, and peer review. Students may also be expected to take a quiz over the concepts covered in laboratory activities. **Students will be required to keep all lab data and reports in a separate laboratory notebook that will serve as evidence of completion of the labs in the course.** Please follow provided lab reporting guidelines carefully.

Tests:
Diligently study for each unit test which will be formatted and graded using the AP Biology Exam grading guidelines.

a. Tests will consist of a multiple choice portion, a grid-in, a long free response portion, and a short free response portion.
b. The multiple choice and grid in questions account for 50% of the test grade. The essay questions account for 50% of the test grade.
c. This will allow you to see how your test grades would correlate to an AP score of 5-1; For example: a high 5 = 100, low 5 = 95, high 4 = 93, low 4 = 89, high 3 = 88, low 3 = 80, high 2 = 75, low 2 = 70, high 1 = 65, low 1 = 55

Assignment Submissions:
All assignments are expected to have the following information in the upper, right hand corner of the paper (Failure to follow this format will result in a **10% deduction from the final assignment grade)**
1. Name (**first & last name**)
2. Submission date
3. Subject with class period
4. Assignment title/description

- All regular classwork and homework assignments must be completed in **ink**. Pencil is only acceptable when recording data for labs, doing mathematical based assignments, sketching for observations, and completing assessments (tests & quizzes). (Failure to follow this format will result in a **10% deduction from the final assignment grade)**

NOTEBOOK Divider Tabs: (Course Documents filed before the first tab) Activating Strategies, Notes, Practice Work, Assessments, Rubrics

~~Please bring the items listed daily. You will not be excused to retrieve items from your locker.~~

Use of Technology
Students are allowed to use digital devices to aid in their learning process. These devices are to be used in the classroom **at the discretion of the teacher**. Any devices being used for purposes that are not educational or beneficial to the learning process may be confiscated.

Grading Policy:
It is the student's and parent's/guardian's responsibility to make arrangements for make-up work due to absences. These arrangements should be made before or after school and should not disrupt instructional time.

- Home-work turned in late will be assessed at a **50% penalty**.

-assignments that are not **IN CLASS** during the correct class period AND at the **EXACT** time of collection are considered late. **Late assignments are collected twice a month: 1st and 15th**. The Highest point possible to be received will be 50 (before grading). Late assignments are only taken during the month they were originally assigned.

- Lab makeup due to an absence will have to be done within a week of the original date on the day determined by the teacher. If there is a scheduling conflict, an alternate assignment will be given. A student who cannot participate in lab due to improper conduct or lab attire will receive a 0 for participation in that lab. An alternate assignment worth **75%** of the original lab will be due **the next day** in class. Failure to have the alternative assignment will result in a **0** for the final lab grade.
- Projects will be docked **50%** for 1 additional day after deadline. Projects not submitted before the 24 hour window expires, will **NOT** be accepted. Because project deadlines are given well in advance, the due dates are the last day the project is on time. It may be turned in early, but late projects for any reason are considered late and will be docked**.**
- Test makeup is to be done the day of return after the absence (before or after school). Test analysis and discussion is done in the class and reassessment is done for those who need it using GPS Mastery Learning Instrument.

Please keep in mind the following:

- ✓ Absences due to suspension from school are considered unexcused.
- ✓ Students are allowed to make up work while suspended from school if there is a pending disciplinary hearing.
- ✓ The number of days to make-up work will not exceed the number of days the student is absent with an excuse as per Henry County rules.

Laboratory Safety:
A separate Lab Safety Contract will be provided for review and signature by both student and parent. It must be signed and returned before you can participate in lab. Failure to adhere by the safety requirements during a lab will result in not being able to participate in the lab and possible receipt of a grade of ZERO for that lab.

Classroom Expectations:
1. Have a **positive** attitude for learning. **Try to do your best.**
2. Quiet during announcements. Listen carefully and follow all directions.
3. Raise your hand before speaking or getting out of your seat, wait to be acknowledged.
4. Complete assignments on time. Late work policy will be enforced.
5. Be in class **on time with and with daily materials** and begin daily activating strategy.
Passes will **NOT** be given during the first 15 minutes or last 15 minutes of class. Students who have special requirements per doctor's orders must have the proper documentation in the personal student file.
7. No food or drink (NO GUM or WATER!!) Students who have special requirements per doctor's orders must have the proper documentation in the personal student file. Always raise your hand to speak and seek permission before getting out of your seat, wait to be acknowledged.
8. Show **respect** to other students, teachers, and school facilities.
9. Everyone is expected to complete their own assignment. Cheating will be addressed per county policy. ***(cheating: copying/sharing work, giving answers to- homework classwork, quizzes, & tests).***
10. Adhere to the guidelines as stated by the school AND county handbooks, or the appropriate consequences will be applied.

Laboratory Investigations Outline:
There are 13 inquiry investigations described in the College Board AP Biology Investigative Lab Manual. These are noted in the course outline as "Inv#_". Each of the investigations is named and correlated with the appropriate curricular big ideas and science practices below:

Investigation 1 – Artificial Selection
Big Idea – 1, 3
Science Practice – 1, 2, 5, 7
Investigation 2 – Mathematical Modeling: Hardy-Weinberg
Big Idea – 1, 3, 4
Science Practice – 1, 2, 5
Investigation 3 – Comparing DNA Sequences to Understand Evolutionary Relationships with BLAST
Big Idea – 3
Science Practice – 1, 5
Investigation 4 – Diffusion and Osmosis
Big Idea – 2, 4
Science Practice – 2, 4, 5
Investigation 5 – Photosynthesis
Big Idea – 2, 4
Science Practice – 1, 2, 3, 4, 6, 7
Investigation 6 – Cellular Respiration
Big Idea – 2, 4
Science Practice – 1, 2, 3, 6
Investigation 7 – Cell Division: Mitosis and Meiosis
Big Idea – 3
Science Practice – 1, 5, 6, 7
Investigation 8 – Biotechnology: Bacterial Transformation
Big Idea – 3
Science Practice – 1, 3, 5, 6, 7
Investigation 9 – Biotechnology: Restriction Enzyme Analysis of DNA
Big Idea – 3
Science Practice – 3, 6
Investigation 10 – Energy Dynamics
Big Idea – 4
Science Practice – 1, 2, 3, 4, 5, 6, 7
Investigation 11 – Transpiration
Big Idea – 4
Science Practice – 1, 2, 4, 6, 7
Investigation 12 – Animal Behavior
Big Idea – 3, 4
Science Practice – 1, 2, 3, 4, 5, 6, 7
Investigation 13 – Enzyme Activity
Big Idea – 2
Science Practice – 2, 3, 4, 5, 6

AP Biology 1st Semester Course Outline

Week #	Topic	Labs	Activities	Big Ideas	Learning Objective	Enduring Understandings
1	Principles of Life, Themes in Biology, Intro to Ecology & Behavioral Biology	Inv#12	Poster Presentations	1, 2, 3, 4		1.A, 1.B. 1.C, 2.C, 2.D, 2.E, 3.E, 4.A
2	Population Ecology, Community Ecology	Inv#10	Modeling trophic structure, Population simulation	2, 4		2.D, 4.A, 4.B, 4.C
3	Ecosystems and Conservation Biology ** Test **		Human Impact Project	2, 4		2.D, 4.A
4	Chemistry of Life, Water and the Fitness of Life, Carbon, The Molecular Diversity of Life	Inv #4	The Path of Carbon, Building Macromolecules	2, 4		2.A, 4.A, 4.B
5	Macromolecules, Energy, Enzymes ** Test **	Inv#13	Manipulate protein models in response to abiotic factors	2, 4		2.A, 2.B, 4.A, 4.B
6	Tour of the Cell		Cell Pages	2, 4		2.B, 4.A, 4.B, 4.C
7	Membrane Structure and Function, Regulating the Internal Environment		Construct model membrane	2, 4		2.A, 2.B, 2.B, 4.A, 4.C
8	** Test ** Buffer Days					
9	Pathways that Harvest and Store Chemical Energy, Cellular Respiration	Inv #6	Toothpickase	2, 4		2.A, 2.B, 4A
10	Photosynthesis ** Test**	Inv #5	Modeling Photosynthesis	2, 4		2.A, 2.B, 4A
11	The Cell Cycle, Mitosis	Inv #7	Cancer Project	3		3.A
12	Cell Communication		Communication Analogies	3		3.D
13	** Test** Buffer Days					
14	Heredity, Meiosis, and Sexual Life Cycles, Mendel and the Gene Idea, The Chromosomal Basis of Inheritance	Inv #7	Inheritance problems, How do we know it's DNA?	3, 4		3.A, 4.C
15	The Molecular Basis of Inheritance	Inv#3	DNA/RNA models (replication, transcription)	3		3.A
16	From Gene to Protein		Modeling protein synthesis	3		3.A
17	** Test ** Buffer Days					
18	Review for Exam and Exam					

This schedule is subject to revision as determined by instructor.

AP Biology 2nd Semester Course Outline

Week #	Topic	Labs	Activities	Big Ideas	Learning Objective	Enduring Understandings
1	Microbial Models: Genetics of Viruses and Bacteria, Organization & Control of Eukaryotic Genomes	Inv #8	Model restriction enzymes	2, 3, 4		2.C, 2.E, 3.A, 3.B, 3.C, 4.A
2	DNA Technology, Genetic Basis of Development ** Test **	Inv # 9	Microarray modeling, Web investigations	2, 3, 4		2.E, 3.A, 3.B, 3.C, 4.A
3	Origins of Life, Mechanisms of Evolution	Inv # 1	Origins research/ Presentation	1, 3		1.A,1.C, 1.D, 3.C
4	Population Genetics and Evolution, Origin of Species	Inv # 2	Selection Essay	1, 3, 4		1.A, 1.B, 1.C, 3.E, 4.C
5	Phylogeny and Systematics **Test**		Construct & interpret cladograms and phylogenetic tress	1, 2		1.B, 2.D
6	Taxonomy, Survey of the Diversity of Life	Bacteria Fungi Protists	Kingdom Surveys	1		1.A, 1.B, 1.C
7	Plant & Animal Diversity, Evolution, and Adaptations	Plant s Animals	Kingdom Surveys	1, 2, 3		1.B, 1.C, 2.A, 2.D, 2.E, 3.D
8	** Test ** Buffer Days					
9	Mechanisms for Maintaining Homeostasis and Responding to the Environment		Acting out membrane transport	2		2.A, 2.B, 2.C, 2.D
10	Feedback Mechanisms, Responding to the External Environment		Construct feedback example chart	2		2.B, 2.C, 2D
11	Mechanisms that reflect ancestry and divergence: Nutrition, Circulation, Gas Exchange, Osmoregulation, Excretion	Inv#11	Systems Scrapbook	2, 3, 4		2.B, 2.D, 3.D, 4.B
12	Defense Mechanisms		Chart for defense mechanisms, Acting out immunity	2		2.D
13	** Test ** Buffer Days					
14	Regulating Internal Environment and Chemical Signaling		Signaling analogies	2, 3		2.B, 3.D
15	Regulation of Animal Development, Nervous Systems, Sensory and Motor Mechanisms ** Test **		Model Neuron, Brain Caps	2, 3, 4		2.B, 2.E, 3.E, 4.A
16	Exam Review					
17	EXAM MAY 11, Special Projects/Labs					
18, 19	Special Projects and Labs					

This schedule is subject to revision as determined by instructor.

Advanced Placement Biology Syllabus Signature Page

Student Name: _____

Grade: Circle/Highlight One (11th, 12th) Class Period:

By signing below, the student and parents/guardian acknowledge that they have read the entire course syllabus and understand the manner in which the class operates.

In order to facilitate ongoing parent/teacher communication, it is highly beneficial to provide a working e-mail address as well as the phone number you can best be contacted at. ***E-mail is the preferred mode of communication as teachers are able to access our computers throughout the day, so please provide an e-mail address if possible.*** Please know that confidential information about your child's progress in class will be the content of these e-mails.

Infinite Campus will be updated regularly in order for you to track the success of your child. Please feel free to contact me at any time using the e-mail address listed at the top of the syllabus.

Parent Name: _____ Parent Email/Phone _____

Parent Signature _____ Date _____

Student Signature _____ Date _____

***** Please Sign and Return to your Instructor*****