

# AP Biology Syllabus

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Welcome to AP Biology! I am excited to teach you all in the wonders and intricacies of our world.

## Course Description

This course is designed to prepare students for the AP Biology exam given in May. AP Biology is structured around four 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.

We will cover all the big ideas in eight units throughout the year. As we cover each unit we will review which big idea and what student practices are connected to the unit. I encourage each student to go over the AP Biology website by Collegeboard and read on the course overview and course and exam description.

The AP Biology curriculum is concordant to an introductory college biology course and students who pass the AP test may receive college credit. I will guide students in using inquiry-based skills, developing critical thinking skills and reasoning during the course and with the use of labs.

Essentially, Biology teaches us about our natural world and since it is always fluctuating, learning about it will help us understand the changes that occur. Students will be able to appreciate the natural world and ask questions in order to explain, test, and remediate, if necessary, natural phenomena.

## Materials

- 1) Textbook – Biology, 11<sup>th</sup> ed. Campbell and Reece. A set of books in class and eText online for readings that you will do at home. If you wish to borrow a book, please come see me. Remember, failure to return this text will result in an obligation at the end of the year.
- 2) Internet access (see above) – Be aware that I will provide handouts or assignments digitally during class and for homework.
- 3) Vocabulary/ Lab notebook – gridded composition notebook. Setup of this notebook is important to the various labs we will do in class as well. We will discuss how to set this up before your first lab.
- 4) Access to the *AP Biology Investigative Labs: An inquiry-based approach* Lab Manual. This is available online at <https://apcentral.collegeboard.org/courses/ap-biology/course/lab-manual-resource-center>
- 5) AP Biology Exam study guide such as Princeton Review, Barrons, or Pearson Test Prep.

- 6) Access to Openstax AP Biology Textbook online – This textbook will supplement the textbook in the event that the textbook is unavailable.

### Laboratory Investigations Component

Students are required to spend 25% of total class time doing labs. Preparation for these labs will include pre-lab work done in your lab notebook and pre-lab questions prior to the day of the lab. The following labs are outlined in the AP Biology lab manual:

Investigation 1: Diffusion and Osmosis

Investigation 2: Enzyme Catalysis

Investigation 3: Mitosis and Meiosis

Investigation 4: Plant Pigments and Photosynthesis

Investigation 5: Cell Respiration

Investigation 6: Molecular Biology

Investigation 7: Genetics of Organisms

Investigation 8: Population genetics and evolution

Investigation 9: Transpiration

Investigation 10: Physiology of the Circulatory System

Investigation 11: Animal Behavior

Investigation 12: Dissolved Oxygen and Primary Productivity

A formal lab report for each investigation will be required to hand in using Turnitin.com. The formal lab is separate from the lab notebook and will be counted as separate grades.

### Grading

Grades in this class will follow the four-point scale.

A = 90% - 100%

B = 80% - 89%

C = 70% - 79%

D = 60% - 69%

F = 0% - 59%

Z = Assignment incomplete/Not turned in

Tests = 4 grades

Quizzes and labs = 3 grades

Lab Notebook, Classwork, and Participation = 2 grades

Home Learning = 1 grade

Extra Credit = 0.5 grades

## Classroom Expectations

Students are expected to follow all district and school rules. Special rules will be issued for labs. Students are expected to keep their work areas organized and clean. Failure to do so could result in poor participation grades that may lower their overall academic grade in the class. My classroom is also intended to be a safe zone; what I mean by this is that every person involved in my classroom will respect all aspects of the other people in the classroom whether it be race, ethnicity, gender expression, sexual orientation, socio-economic background, age, religion and ability. I encourage all students to speak to me directly or to other teachers and administrators if they feel disrespected or unsafe anywhere at MBSH.

As this is a college-level course I expect students to bring a level of maturity and respect to the classroom. Being on time to class, being prepared for class, turning in assignments in a timely manner and paying attention are all important aspects of the learning experience. The use of a device is necessary to this experience, however, the use of cellphones is not. Please bring a computer or tablet to class whether it be personal or a device borrowed from the school. I will not allow the use of cellphones unless I have given my permission. Refer to the BYOD Policy provided on my webpage.

## Academic Honesty

Students will adhere to the district's policy on academic integrity.

Cheating – According to the M-DCPS Code of Student Conduct, intentionally using another's work to receive credit or improve grades, plagiarizing, or giving or receiving answers during testing is a Level II Violation.

Forms of academic dishonesty include but are not limited to:

- Plagiarism
- Fabrication
- Deception
- Sabotage
- Cheating
- Impersonation

The act of plagiarism is a severe form of cheating which constitutes intellectual theft. Plagiarism occurs when a person passes off someone else's work as his/her own. Whether a student copies an assignment, downloads a paper from an Internet site, or uses a cut and paste system for creating text, that student has committed plagiarism. All parties to plagiarism are equally guilty, regardless of whether the student gives or receives work.

Students who plagiarize will face any or all of the following consequences:

First Offense

1. The student's parent will be contacted.
2. The student will receive an F for the assignment. If the assignment receives multiple grades, the

assignment will be given multiple Fs.

3. The student will be referred to the lead teacher and/or an administrator for possible disciplinary action.
4. The student's effort and/or conduct grade may be lowered for that grading period.
5. The student will receive a referral.
6. All teachers of that student will be informed of the offense.

#### Second Offense

1. A parent conference with the lead teacher and/or an administrator will be required.
2. Honor Society membership and/or student council membership and/or positions of leadership may be revoked.
3. School awarded honors, including Silver Knight, or representation of our school in any other capacity may be denied.
4. If the offense occurred in an AP or Honors course, the student may be withdrawn from that course.

#### Additional Notes

If students or parents have any questions about the course please see me during my planning period or after school. I am happy to discuss with you any questions or concerns you may have regarding the class.

If a student wishes to have extra materials for studying I am glad to provide information that can help. Students at this level will be responsible for their own way of learning but I will be glad to guide them if necessary.

**Late work:** Late work will NOT be accepted. It is strongly recommended that you attend class every day in a timely fashion. Excessive lateness or absences will make it very difficult for you to keep up with the workload of this course. **If you have an excused absence, it is your responsibility to makeup all assignments.** "I was absent" is not an excuse for missing an assignment (unless I excuse you). If you foresee any problems submitting work on time let me know before the due date. Please discuss missed work with me as soon as you return to class. Work done during absences is due one day after your return to class. You must also make arrangements to make up any labs, quizzes or tests as soon as you return to school.

#### Course outlook

Over the course of the year students will complete activities and labs that address the necessary student practices for each unit and topic. Below are the practices and the course outline for the coming year.

#### **Science Practices to be addressed in this course**

The science practices capture important aspects of the work that scientists engage in, at the level of competence expected of you, an AP Biology student

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.

Unit	Topics	AP Lab/ Activity	Big Idea
1: Biochemistry	<ul style="list-style-type: none"> <li>- Water</li> <li>- Carbon</li> <li>- Macromolecules</li> </ul>	<ul style="list-style-type: none"> <li>▪ Properties of water lab</li> <li>▪ Modelling Macromolecules</li> </ul>	<ul style="list-style-type: none"> <li>▪ Evolution</li> <li>▪ Energy &amp; Homeostasis</li> <li>▪ Interactions &amp; Ecology</li> </ul>
2: The Cell	<ul style="list-style-type: none"> <li>- Cell Theory</li> <li>- Types of cells</li> <li>- Cell types</li> <li>- Cellular membrane</li> <li>- Cell Communication</li> <li>- Cell communication</li> <li>- Homeostasis and transport</li> </ul>	<ul style="list-style-type: none"> <li>- Diffusion &amp; Osmosis</li> <li>- Cell type 3D model</li> </ul>	<ul style="list-style-type: none"> <li>- Evolution</li> <li>- Energy &amp; Homeostasis</li> <li>- Interactions &amp; Ecology</li> </ul>
3: Energy	<ul style="list-style-type: none"> <li>- Cell cycle/Cell division</li> <li>- Photosynthesis/ Cellular respiration</li> <li>- Metabolism</li> </ul>	<ul style="list-style-type: none"> <li>- Photosynthesis</li> <li>- Cellular Respiration</li> <li>- Enzyme Catalysis</li> </ul>	<ul style="list-style-type: none"> <li>- Evolution</li> <li>- Energy &amp; Homeostasis</li> <li>- Interactions &amp; Ecology</li> </ul>
4: Cell Communication	<ul style="list-style-type: none"> <li>- Signal Transduction</li> <li>- Feedback</li> <li>- Cell Cycle</li> <li>- Cancer</li> </ul>	<ul style="list-style-type: none"> <li>- HHMI Biointeractive cell signaling pathway activity</li> </ul>	<ul style="list-style-type: none"> <li>- System Interaction</li> <li>- Information Storage and Transfer</li> </ul>
5: Heredity	<ul style="list-style-type: none"> <li>- Meiosis</li> <li>- Mendelian Genetics</li> </ul>	<ul style="list-style-type: none"> <li>- Cell division: Mitosis and Meiosis</li> <li>- Bacterial Transformation</li> </ul>	<ul style="list-style-type: none"> <li>- Evolution</li> <li>- Energy &amp; Homeostasis</li> <li>- Interactions &amp; Ecology</li> </ul>
6: Genetics	<ul style="list-style-type: none"> <li>- DNA, Replication, Transcription</li> <li>- Sex-linked genes/nonnuclear inheritance</li> </ul>	<ul style="list-style-type: none"> <li>- Gel electrophoresis Lab</li> <li>- Practice Free Response questions</li> </ul>	<ul style="list-style-type: none"> <li>Information Storage and Transfer</li> </ul>

	- Biotechnology		
7: Evolution	<ul style="list-style-type: none"> <li>- Origin of life</li> <li>- Mechanisms of Evolution</li> <li>- Evidence for evolution</li> <li>- Phylogeny</li> <li>- Speciation</li> </ul>	<ul style="list-style-type: none"> <li>- Artificial selection</li> <li>- Hardy- Weinberg Problem Sets using class data</li> <li>- Natural Selection graphing activity</li> </ul>	<ul style="list-style-type: none"> <li>○ Evolution</li> <li>○ Genetics</li> <li>○ Interactions &amp; Ecology</li> </ul>
8: Ecology	<ul style="list-style-type: none"> <li>- Population dynamics</li> <li>- Communities and Ecosystems</li> <li>- Global Issues</li> </ul>	<ul style="list-style-type: none"> <li>- Energy dynamics Lab</li> <li>- Math Practice: Population growth</li> </ul>	<ul style="list-style-type: none"> <li>- Evolution</li> <li>- Energy &amp; Homeostasis</li> <li>- Interactions &amp; Ecology</li> </ul>
8: Plant Form and Function	<ul style="list-style-type: none"> <li>- Plant Phylogeny</li> <li>- Structure</li> <li>- Flower reproduction</li> <li>- Response to Environment</li> </ul>	<ul style="list-style-type: none"> <li>- Transpiration Lab</li> <li>- Identify parts of a plant/flower with plant specimen</li> </ul>	<ul style="list-style-type: none"> <li>- Evolution</li> <li>- Energy &amp; Homeostasis</li> <li>- Interactions &amp; Ecology</li> </ul>
9: Animal Structure and Function	<ul style="list-style-type: none"> <li>- Development</li> <li>- Physiology</li> <li>- Response to Environment</li> </ul>	<ul style="list-style-type: none"> <li>- Animal Behavior</li> <li>- Mice party drug reactions activity</li> </ul>	<ul style="list-style-type: none"> <li>- Evolution</li> <li>- Genetics</li> <li>- Interactions &amp; Ecology</li> </ul>

Thank you and I hope we all have a successful and fulfilling year!

Ms. G

### Acknowledgement AP Biology Syllabus

To the student and their parent(s)/guardian(s): I am excited about this new school year, and I will do everything I can to make this a productive and enjoyable year together of learning and discovery in Biology! With that goal in mind, I have created the preceding syllabus and classroom policies/expectations to help keep everything running smoothly. I believe if we are all on the “same page” and work together, we can make this the best possible learning experience for everyone.

Please acknowledge receipt of this syllabus and complete the form by clicking the following link before the end of the first week of school.

Click here → <https://forms.office.com/>