

# Advanced Placement Biology

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## Virtual Learning

We will start the 2020-2021 Academic Year virtually. When we return to campus, we will continue to use the online resources introduced during the first days of school. We may eventually return to virtual learning at some point, so please be prepared.

## Grading

70% of your grade will come from "Major" assessments. These are unit exams and chapter quizzes.

30% of your grade will come from "Minor" assignments, including lab work at the lab bench and in the field, notebook grades, personal progress checks in AP Classroom, and other daily class work.

## Tutorials

8:00 - 8:55 daily  
4:20 - 5:20 daily

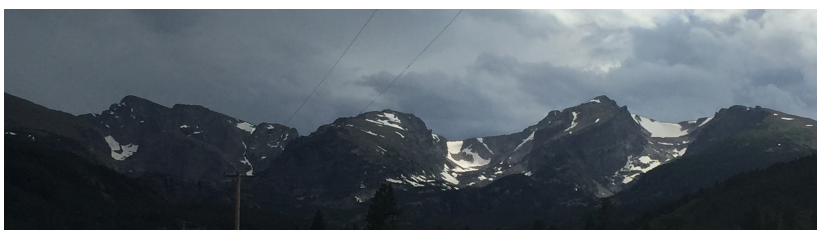
## Conference Periods

4th Period and 8th Period



## Welcome to AP Biology!

This course is intended to be an introductory university-level course for Biology majors. The AP Biology course has been designed to place a strong emphasis on inquiry. At least 40% of our scheduled class time will be dedicated to laboratory investigations. Additional time will be dedicated to field investigations and web-based research. Students enrolled in this course are expected to demonstrate the commitment, and produce the scholarly work, commensurate with such a course. You can expect the rewards for that work and commitment to be substantial.





## Digital Tools

**Google Classroom** will be our Learning Management System (LMS) to start the academic year. You will find Classwork and our communication Stream here.

We will transition to the **Canvas** LMS at some point.

**AP Classroom** will be one of our primary online resources. You will complete Progress Checks, quizzes, and exams on AP Classroom. This is a great tool to prepare for the *AP Biology Exam*.

**Mastering | Biology** is our other primary online resource. This is where you will access the e Text for *Campbell Biology 11e*, construct your content knowledge in the discipline.

For the 2020-2021 Academic Year, I will be constructing a supplementary website on **Google Sites**. This is where you will access announcements and weekly checklists.

I will continue to construct and manage my primary professional website, [www.rquarles.com](http://www.rquarles.com), for now. You will be able to access some of the tools above, as well as additional materials for this course.

## The Big Ideas in AP Biology

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.

## Class time is thinking time.

Content, reasoning, and inquiry are equally important in this course. We will spend a great deal of time during class on the reasoning piece and the inquiry piece, and will relate the content piece to our work. A large part of the content piece needs to be completed outside of class time. You will be expected to complete the reading assignments outside of class time and be prepared for class discussions, quizzes, and laboratory work when you arrive. During class you will process the knowledge you have gained and apply that knowledge to your investigative work.



### Success in AP Biology

Students who are successful in college Biology for Majors, as well as AP Biology, exhibit the following traits:

- They attend class.
- They complete the assigned readings before coming to class.
- They document their work, including their thinking, reading, and writing outside of class time.
- They treat this space as a university laboratory.
- They participate in all activities during class, especially laboratory and field investigations.
- They prepare.
- They use their tools.
- They seize opportunities.

### Required Materials

Bring **pen and pencil** daily.

Bring your **interactive notebook** (*iNotebook*) each day. You may use any style of notebook you like, but you must keep an analog notebook, and it must be interactive. You can purchase formal lab notebooks at the University Co-op, or order one online.

You will also need a binder, file folders, or **some organization system** at home. As a biologist, you must construct your content knowledge in the discipline.

### Meeting Times

There is no bell schedule for when we are able to return to campus, but this class will continue to meet during 3rd Period. For the beginning of the academic year, while we are meeting virtually, we will follow this schedule:

<b>Synchronous</b>	<b>12:35 -1:05</b>
<b>Asynchronous</b>	<b>1:05 - 2:05</b>

At the beginning of the synchronous portion of class, please go to Google Classroom and follow the link to the Zoom meeting. Open your *iNotebook*, and complete any work assigned to start class in the Stream or Classwork section of Google Classroom.

### Constructivist Learning

Constructing content knowledge outside of class time requires using a variety of tools. Reading, writing, and carrying on scholarly discussions with others all contribute to the construction of your knowledge within the Biology discipline.

#### ***Biologists are readers.***

The hard copy of our textbook is *Campbell Biology 9th Edition*, by Jane Reece, et al. You will have online access to the eText for *Campbell Biology 11e* through the Mastering | Biology website. My experience has been that those students who make qualifying scores on the *AP Biology Exam* complete the assigned readings on time. You are expected to read all assigned readings, but I will not assign every page of the textbook. I will assign only those sections that are specifically covered within the *AP Biology Course and Exam Description*. You can expect a quiz over every assigned reading.

Our main laboratory manual is *AP Biology Investigative Labs: An Inquiry-Based Approach*, The College Board (2019). We



## Quantitative Reasoning

Quantitative reasoning is covered extensively in our lab manual, *AP Biology Investigative Labs: An Inquiry-Based Approach*, as well as Quantitative Skills in the AP Sciences, both from The College Board.

To have a rich foundation in biology, you must apply quantitative methods to the study of biology. This is even more true for an exemplary laboratory experience. Quantitative reasoning is an essential element in conducting inquiry in this course.

Many mathematical tools were originally developed to solve biological problems. It is important that you have an **approved calculator** for use on the *AP Biology Exam*, and know how to use it. It is also important that you have access each time we meet to "Appendix A: **AP Biology Equations and Formulas**," *AP Biology Investigative Labs: An Inquiry-Based Approach*, p. A1.

will supplement this with additional laboratory investigations from Carolina Biological Supply and other resources.

## Outside Reading

There is a great deal of assigned reading in this course. I have learned over the years that some students still have the time and motivation to do additional reading in this field. I will publish a list of Great Book for AP Biology, from which you may choose a book to read for extra-credit. More on that coming soon.

## Outreach Lectures

Another opportunity to construct content knowledge is to attend outreach lectures. The **Hot Science - Cool Talks** outreach lecture series hosted by the Environmental Science Institute at the University of Texas at Austin is often directly related to the topics of this course. You can either attend in person, or access the content knowledge through the archived lectures at [www.esi.utexas.edu](http://www.esi.utexas.edu).

Additional outreach lectures at UT-Austin include the **BrainStorms** series conducted by the Neurosciences Department and the **Science Under the Stars** series conducted by the Graduate Student Association in the College of Natural Sciences.

## Interactive Notebook (iNotebook)

One of the new requirements in the *AP Biology Course and Exam Description (2019)* is that students keep a notebook recording their experiences in the course, and be able to provide that to universities when seeking credit.

During our quarantine last Spring, as we prepared for the *2020 AP Biology Exam*, it was obvious that those best prepared were the students who kept a good notebook all year, and also made sure it was interactive.

Your *iNotebook* will maintain a written record of investigations conducted.

## Notes

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Lab reports that emphasize the development and testing of a hypothesis, the ability to organize collected data, and the ability to analyze and clearly discuss the results, will be constructed in your *iNotebook* using a format that is standard in university-level Biology courses.

As a scientist, one of your most prized possessions should be your notebook. There are many methods to organize your notebooks, all of them excellent in their own way. Your method should be uniquely organized for you. I will not prescribe a notebook method, but I will give you some guidelines. However you organize your biological notebooking experience, it should be a collection of evidence of your work in this class.

You will document all of your lab work in the *iNotebook*. If it isn't in the notebook, you didn't do it. You must have your notebook, or notebooks, whenever you are in the lab. Do not leave them at home. Your notebook includes notes over all of your investigative work for the year, with all data and observations, and your initial analysis and conclusions.

You will also keep all on-going notes for this course, including the readings, field experiences, and extra-credit opportunities, in your *iNotebook*.

We will set up our *iNotebooks* beginning Monday, 08.17.2020, so please be prepared.

### ***Collecting and Organizing Your Biological Work***

Please develop a system for keeping all lab worksheets, as well as any other papers that are evidence of your AP Biology experience, organized in some fashion. This may include annotated readings, class handouts, and any other item that may be useful as a study tool at exam time. A binder works well for this purpose. You could also organize things in boxes, or folders, or bags...

## Notes

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### **Digital Portfolio**

I have tried a variety of digital notebook experiences in recent years, and none of them have worked. Students have good intentions, and try, but get bogged down in all of the work they have to do for all of their different classes. With much of our work in Google Classroom, and many of our documents in Google Drive, this may actually work this year.

While you may be working in a digital format most of the time, you must still have your analog *iNotebook* available any time you are in the lab. Print digital files and paste them into your analog notebooks. If you create a digital file, and you establish a digital portfolio in which to keep it, you must be able to access it from a school computer or your personal digital device at any time.

In order to document your experience in this class for universities, you should save copies of all digital files for yourself as we proceed through the academic year.

Use these items to connect the big ideas through the enduring understandings. You must have evidence that you are doing so through some kind of product. Some, but not all, of these products will be explicitly assigned, while others may be generated on your own.

### **Prep Books**

The prep book I most recommend is *AP Test Prep Series: AP Biology (to accompany Campbell Biology 11e AP Edition)*, by Fred W. Holtzclaw and Theresa Knapp Holtzclaw.

## Science Practices for AP Biology

These practices serve as a lens through which you view the content of the course. Questions on the AP Biology Exam will focus on how you are able to demonstrate these practices.

A practice is a way to coordinate knowledge and skills to accomplish a goal or task. These practices enable students to establish lines of evidence and use them to develop and refine testable explanations and predictions of natural phenomena.

You are expected to demonstrate these practices on a regular basis, throughout this course, particularly during laboratory investigations.

- 1. Concept Explanation** - Explain biological concepts, processes, and models presented in written format.
- 2. Visual Representations** - Analyze visual representations of biological concepts and processes.
- 3. Questions and Methods** - Determine scientific questions and methods.
- 4. Representing and Describing Data** - Represent and describe data.
- 5. Statistical Tests and Data Analysis** - Perform statistical tests and mathematical calculations to analyze and interpret data.
- 6. Argumentation** - Develop and justify scientific arguments using evidence.

### Laboratory Investigations

It is very important that, when we are able to return to campus, we spend almost all of our time working on these labs. The *AP Biology Exam* is largely about applying the content knowledge you have constructed, through these scientific practices, with regard to these specific experiences, to construct a response.

You will largely construct your content knowledge outside the lab, then apply it inside the lab... ***just like college!***

Laboratory Investigation	SP1	SP2	SP3	SP4	SP5	SP6
Origin of Life	X	X	X	X	X	X
BLAST	X				X	
Hardy-Weinberg	X	X			X	
Artificial Selection	X	X			X	
Cellular Respiration	X	X	X			X
Photosynthesis	X	X	X	X		X
Diffusion and Osmosis		X		X	X	
Cell Communication			X	X	X	X
Cell Division	X				X	X
Bacterial Transformation	X		X		X	X
Restriction Enzyme Analysis			X			X
Energy Dynamics	X	X	X	X	X	X
Fruit Fly Behavior	X		X	X	X	X
Transpiration	X	X		X		X
Enzyme Activity					X	X