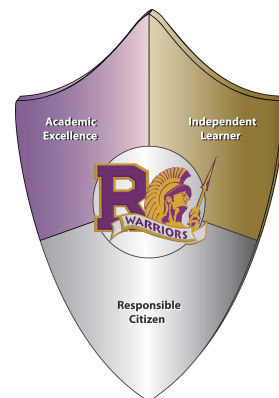


# AP BIOLOGY SYLLABUS ~ 2019-2020

## Instructor's Information

Course: Advance Placement Biology (A/B)  
Instructor: Mrs. R. R. Wingerden  
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## Text book

*Biology AP Edition* - Campbell & Reece (8th Edition)

**Course Description-** AP Biology is a year-long course designed for high school students as an opportunity to earn AP credit on their high school transcript, as well as placement credit for an introductory college-level science course. Students who earn a qualifying score on the AP Biology Exam are typically eligible to receive college credit and placement in an advanced science course in college. This course is aligned to the College Board AP Biology Curriculum Framework and is based on four Big Ideas, which encompass core scientific principles, theories, and processes that cut across traditional boundaries and provide a broad way of thinking about living organisms and biological systems. Twenty-five percent of instructional time is devoted to hands-on laboratory work with an emphasis on inquiry-based investigations. Investigations require students to ask questions, make observations and predictions, design experiments, analyze data, and construct arguments in a collaborative setting, where they direct and monitor their progress. This course is designed to prepare students for the Biology College Board Advanced Placement Exam. This course is also a **concentrator course** for the CTE Environmental Resources Pathway.

**Prerequisites-** Junior or senior standing only. Successful completion of one year of the following courses: Biology (P) with an "A" **or** Honors Biology (P) with a "B" or better, **and** Chemistry (P) with a "B" or better.

**Required Course Materials-** three ring binder, lined loose leaf paper, one 5 x 5 quadrille ruled composition notebooks (100 pages, 9 3/4" x 7 1/2"), graph paper, pens, pencils, highlighters, colored pencils (8 pkg.) and a calculator

**Summer Assignment-** The summer assignment is due the first day of the course in the Fall semester (August 2018). This assignment may be acquired from your guidance technician or from the AP Biology course website (<http://www.rwingerden.com/apbio/SummAssign/>). This assignment is designed primarily to familiarize students with the vast diversity of life and how evolution serves as a foundation and unites modern biology. Secondly, this assignment serves as a review of the chemical foundation for which all life is built and an introduction to the level of academic dedication and maturity necessary to be successful in AP Biology. **Information regarding textbook checkout will be provided at the May 16, 2017 lunch meeting in room 121 and can also be found on the AP Biology course website (<http://www.rwingerden.com/apbio/SummAssign/>).**

**Assessments** Grades are calculated on a percentage basis. The value of each individual assignment varies. Students earn a grade based on the quality and accuracy of the work they complete. Overall class grades are based on a straight percentage, not a curve.

Exams and Quizzes	50%
Labs and Lab Reports	25%
Homework / Readings	25%

## **Exams**

At the end of each unit, an exam will be given, which is 50 percent multiple choice/grid-in and 50 percent free response. Unit exams will be completed in two 50 minute class periods and testing time for these exams will be limited just as it is for the AP Biology Exam. There will be a comprehensive final exam at the end of each semester. Final exams will be multiple choice and cumulative in nature.

## **Quizzes**

At a minimum, one quiz will be given each week. Some quizzes will be announced and others will not. Quizzes will vary in format depending on the topic being covered.

## **Lab & Lab Reports**

Lab reports are required for each of the recommended Inquiry-Based AP Biology Labs. These reports may include: title, introduction/background information, purpose, hypothesis, procedure, data/results, analysis, question, and conclusion. Students work in pairs to complete lab procedures, but are responsible for turning in individual lab reports. Students are encouraged to produce a high quality report and are given a week from the conclusion of the lab to submit their report.

A formal lab write-up for the remaining additional labs are not required. In these cases, student's lab papers will include pre-lab questions, data/results, analysis, and post-lab questions, which are geared to emphasize the key concepts of the lab.

Students may be asked to design an experiment, which they will implement at home. The student will propose, in writing, the scientific question they wish to investigate to the instructor. After question approval, students formulate a hypothesis and design an experiment to test their hypothesis. Experimental designs are then peer-reviewed, redesigned if needed, and conducted by the student out of class. This project gives students a chance to be creative and apply the scientific method to a question they wish to investigate. Students work individually and have four weeks to implement their approved experimental design and write their formal lab report.

## **Homework & Readings**

An outline of this AP Biology course, which includes assignments and readings for the year, will be given to the students. Additionally, on the last day of each school week, students are reminded of upcoming assignments and due dates for the following week. This information is posted in class and on the AP Biology course website. When appropriate, PDFs of assignments are provided on the website along with links to related references.

Homework will take many forms and is designed to help with student understanding of the current unit being studied. Homework assignments for each unit include, but are not necessarily limited to, the following; completion of Major Themes Concept Maps, justify why the answers to the "self-quiz" multiple-choice section at the end of each assigned chapter are correct, answering the "evolution connection" question at the end of each assigned chapter, and answering free-response questions, which are related to the unit.

Readings for each unit include chapters from the textbook, which contain information that will be covered. Scientific abstracts and papers are assigned with the purpose of showing how discoveries are made and demonstrate that science is the process. Articles found in science magazines and online news sources are also assigned to promote discussion about social and environmental concerns.

## Lab Component

The laboratory experience is extremely important in the AP Biology course and is used to emphasize that biology and science is a process, which involves development and testing of a hypothesis, collection, analysis, and presentation of data with a clear discussion of the results. To ensure the lab component of the course is met, on average, one day out of every four is devoted to laboratory work. Students are required to come in to the laboratory prepared and ready to complete the day's procedure. Lab reports are then completed at home.

During the course, students will complete the recommended laboratories in the *AP Biology Investigative Labs: An Inquiry-Based Approach*. The topics covered in these labs are:

Investigation 1	Artificial Selection
Investigation 2:	Mathematical Modeling; Hardy-Weinberg
Investigation 3:	Comparing DNA Sequences to Understand Evolutionary Relationship with BLAST
Investigation 4:	Diffusion and Osmosis
Investigation 5:	Photosynthesis
Investigation 6:	Cellular Respiration
Investigation 7:	Cell Division: Mitosis and Meiosis
Investigation 8:	Biotechnology: Bacterial Transformation
Investigation 9:	Biotechnology: Restriction Enzyme Analysis
Investigation 10:	Energy Dynamics
Investigation 11:	Transpiration
Investigation 12:	Fruit Fly Behavior
Investigation 13:	Enzyme Activity

The course also includes additional lab activities, which have been chosen to emphasize topics covered in the course that are not addressed in the recommended AP Biology Laboratories.

## Topic Outline For The Year

The AP Biology Curriculum is framed around four Big Ideas. For each of these Big Ideas, there is a set of core concepts called Enduring Understanding, which will be used to guide the AP Biology course curriculum. Below is an outline of the AP Biology Curriculum Big Ideas and the Enduring Understandings topics covered in this course. **AP Biology is a rigorous course that demands personal responsibility from the student.** In order for students to plan effectively, they are provided with due dates for all major projects, labs and tests. They are strongly encouraged to complete nightly readings and study each day's lecture notes on their own time.

Big Ideas	Enduring Understanding
<b>Unit One</b> The process of evolution drives the diversity and unity of life.	A. Change in the genetic makeup of a population over time is evolution. B. Organisms are linked by lines of descent from common ancestry. C. Life continues to evolve within a changing environment. D. The origin of living systems is explained by natural processes.
<b>Unit Two</b> Biological systems utilize energy and molecular building blocks to grow, reproduce, and maintain homeostasis.	A. Growth, reproduction, and maintenance of the organization of living systems require free energy and matter. B. Growth, reproduction, and dynamic homeostasis require that cells create and maintain internal environments that are different from their external environments. C. Organisms use feedback mechanisms to regulate growth and reproduction, and to maintain dynamic homeostasis. D. Growth and dynamic homeostasis of a biological system are influenced by changes in the system's environment. E. Many biological processes involved in growth, reproduction, and dynamic homeostasis include temporal regulation and coordination.
<b>Unit Three</b> Living systems retrieve, transmit, and respond to information essential to life processes.	A. Heritable information provides for continuity of life. B. Expression of genetic information involves cellular and molecular mechanisms. C. The processing of genetic information is imperfect and is a source of genetic variation. D. Cells communicate by generating, transmitting, and receiving chemical signals. E. Transmission of information results in changes within and between biological systems.
<b>Unit Four</b> Biological systems interact and these interactions possess complex properties.	A. Interactions within biological systems lead to complex properties. B. Competition and cooperation are important aspects of biological systems. C. Naturally occurring diversity among and between components within biological systems affects interactions with the environment.

**Put this syllabus in your notebook for future reference.**

Please sign, remove this page from the packet, and **return it to Mrs. Wingerden (room 121)**.

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## AP BIOLOGY ~ 2019-2020

### STATEMENT OF UNDERSTANDING

By signing this contract, the parent and the student acknowledge that they have read the preceding documentation (**AP Biology Summer Assignment** and **AP Biology Syllabus**) for Mrs. Wingerden's **AP Biology** class and that they *understand* and *agree* to the commitment necessary to be successful in this course.

\_\_\_\_\_ /  
printed student name

\_\_\_\_\_ /  
signature of student / date

\_\_\_\_\_ /  
signature of parent or guardian

Please return **completed** STATEMENT OF UNDERSTANDING to **Mrs. Wingerden (room 121)** to be eligible for enrollment in AP Biology Course.

AP Biology Syllabus 2019-2020