

Advanced Placement (AP) Biology Course Information

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I. Course Description:

This year-long study of biology is an introductory biology taken by biology majors during their first year of college. **WELCOME TO COLLEGE!** The course is structured around the *enduring understandings* within **four big ideas** in biology, and will provide a basis for students to develop a deep conceptual understanding as well as opportunities to integrate biological knowledge and science practices through inquiry-based activities and laboratory investigations.

After the successful completion of this course, students may receive college credit with a qualifying score on the AP exam.

(Note: Not all colleges accept the same exam scores, please check with your future college choices to ensure credit).

AP Biology is historically a challenging and difficult class, but with effort and dedication, many students do well. There are many resources available to help you and students using them often succeed. I am committed to helping you be as successful as you choose to be, so please do not hesitate to come in or contact me for any questions, concerns or assistance.

II. Course Content:

AP Biology is structured around four big ideas, the enduring understandings within the big ideas and the essential knowledge within the enduring understandings.

The Big Ideas:

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

Big Idea 2: *Biological systems use energy and molecular building blocks to grow, to reproduce and to maintain 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.*

I follow a micro- to macro- arc, starting with molecules (*yes – CHEMISTRY*) then cell structure, cellular energetics, and the cell cycle. Molecular and Mendelian Genetics follows, which will flow into a hefty unit of Evolution which leads into homeostasis in humans (*multicellular molecular signaling, developmental biology, and animal behavior*) – which we can now look at from a truly evolutionary standpoint. The year finishes up with ecology as we also tie in all content into the major themes of the course.

III. Laboratory Component:

Students will be given the opportunity to engage in student-directed laboratory investigations throughout the course for a minimum of 25% of instructional time. Students will conduct a minimum of 4 inquiry-based investigations (*one per quarter...hopefully*). Additional labs and activities will be conducted to deepen students' conceptual understanding and to reinforce the application of science practices within a hands-on, discovery-based environment. Students will be given the opportunity to develop, record and communicate the results of their laboratory investigations via many ways including, but not limited to, formal laboratory reports.

A. Science Practices (SP) in AP Biology:

- SP1: Concept Explanation:** The student can use representations and models to explain biological concepts and processes.
- SP2: Visual Representations:** The student can analyze visual representations of biological concepts and processes.
- SP3: Questions and Methods:** The student can engage in scientific questioning to extend thinking or to guide investigations within the context of the AP course.
- SP4: Representing and Describing Data:** The student can plan and implement data collection strategies appropriate to a particular scientific question and present the data appropriately.
- SP5: Statistical Tests and Data Analysis:** The student can perform statistical tests and mathematical calculations to analyze and interpret data.
- SP6: Argumentation:** The student can develop and justify scientific arguments using evidence.

The descriptions below summarize some of the major investigations we will do this year. Additional prescribed activities supplement the student inquiry.

Big Idea 1: Evolution

Hardy Weinberg: Students investigate factors affecting Hardy Weinberg Equilibrium.

Artificial Selection: Students will cross plants and/or breed organisms to select for specific traits.

Big Idea 2: Cellular Processes

Enzyme Investigation: Students will investigate factors that affect enzyme action.

Cellular Respiration: Students investigate some aspect of cellular respiration in organisms.

Photosynthesis: Students investigate photosynthetic rate under a variety of student selected conditions.

Diffusion/Osmosis: Students investigate diffusion and osmosis in model systems and in plant tissue.

Big Idea 3: Genetics and Information Transfer

Cell Division: Mitosis and Meiosis

Restriction Enzyme Analysis: Students investigate restriction enzyme analysis using gel electrophoresis.

Big Idea 4: Ecology

Energy Dynamics: Students analyze model systems that describe energy flow.

Animal Behavior: Students investigate animal response(s) to various stimuli.

Transpiration: Students investigate the movement of water through plants.

Population Sampling: Students estimate the size of various populations of organisms.

IV. Course Information:

Texts: BIOLOGY by Campbell and Reece, 6th Edition, ISBN 0-8053-6624-5, Benjamin Cummings, 2002

Review Book: CliffsNotes AP Biology, 5th Edition

Class Resources: www.colleascorner.weebly.com

Evaluation:

Students are tested at the end of every unit with various types of homework quizzes in between. These quizzes mostly consist of multiple choice questions included in their student study guides. Tests will mirror the AP exam and consist of multiple choice/short answer/lab-based questions and free response questions. At the start of every unit students are given a list of *possible* free response questions of which 1 or 2 will appear on their exam. All exams will be handed back and reviewed in a timely fashion. The progressive weight of graded assignments is listed below.

First Quarter		Second Quarter		Third Quarter		Fourth Quarter	
Tests	50%	Tests	60%	Tests	70%	Tests/Project	80%
Quizzes	20%	Quizzes	15%	Quizzes	10%	Participation	20%
Labs	20%	Labs	15%	Labs	10%		
Participation	10%	Participation	10%	Participation	10%		
<i>Father McShane Method of Class Participation</i>							

Attendance:

Class attendance and participation is essential for success and is worth 10% of your grade. It is your responsibility to check Collea's Corner and to clarify missed assignments with classmates or with me prior to the next class. No credit will be given for work missed due to an unexcused absence. All excused absence work, including labs, must be made up within the time frame of that unit of study. Requests for exceptions to these policies must be discussed with me in advance.

Assignments:

Doing the Interactive Learning Guides assigned for each class and scanning/submitted to Google Classroom **BEFORE** coming to class is necessary to benefit from what we do in class and will make up part of your class participation grade. These guides will accompany the content in your Campbell Biology textbook and will be available for download on my course website. Students will be assigned homework in their Interactive Learning Guides on a daily basis along with other assignments including, in-class activities, lab exercises and reports, quizzes, and exams (*take-home and in-class*). Student expectations are high for this course. You should plan to work on AP Biology a **MINIMUM of 1.0 hour EVERY NIGHT** (*including weekends*). We will at cover a maximum 2 chapters per week and will have multiple choice/short answer/FRQ exams that follow the same format as the actual AP exam you will be taking sometime in first 2 weeks of May. A midterm exam will be given before the end of the 2nd marking period and a final exam will be given right after all AP exams are done. The average of both exams will constitute your final exam grade for the course.

No credit will be given for late work unless it was discussed in advance
or
due to unforeseen, extenuating circumstances.

North Salem University AP Biology Honor Code:

Students are to submit only their own work for evaluation except when working with your lab partner on a lab report or with your fellow classmates on FRQ outlines. While conducting an experiment, the sharing of data is expected, however you must organize, analyze and come to conclusions based upon the data on your own. Asking a fellow classmate what they got for an answer on a multiple choice study guide question is not “*working together*” it’s cheating. If this is ever observed homework quizzes will stop counting for a grade. The use of cell phones for cheating purposes is rampant and will NOT be tolerated. In fact, cell phone use is strictly prohibited during class and all phones should be turned off and placed in the cubby located in the back of the room prior to the start of class.

Students who fail to comply with the North Salem University AP Biology Honor Code will be subject to disciplinary action. Plagiarism and cheating will not be tolerated and may lead to a zero on an assignment, a discipline referral to Dr. Murphy and even loss of credit or removal for the class.

Classroom Rules:

1. Turn off and store all personal electronic devices in your designated cubby prior to the start of class.
2. All policies set forth in the Student Handbook must be adhered to.
3. Safety is a primary concern and all students must comply with the Laboratory Safety Contract which will be reviewed the first days of school.
4. Come to class with an open mind and willingness to work hard.

Social and Ethical Concerns:

It is important that you connect your classroom knowledge to socially important issues. The course will allow you to learn about and discuss many such issues in a variety of formats. After the AP exam in May, you will be required to complete a bioethics research report and presentation focusing on a major controversial bioethical/social issue and/or use/misuse of science and technology in the 21st century. This report will constitute a large portion (75%) of your 4th quarter grade.

AP Biology will be a challenging and powerful learning experience for each of us and I am excited you chose to take this class. I am committed in helping you be as successful as you choose to be, so please do not hesitate to come in to talk to me personally or to contact me via email should you ever have any questions or concerns.

Mr. Collea