AP Biology Syllabus Fall 2020

Richmond Community High School
201 E Brookland Park Blvd
Richmond, Virginia 23222

Instructor: Ms. Spencer
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Class Website: SciSpencer.weebly.com
Office hours: Wednesdays - contact me in advance to arrange tutoring/help on these days
Digital textbook: https://openstax.org/books/biology-ap-courses/pages/preface
(Note that chapters are not in the same order our course will follow)
Recommended: Barron's AP Study Guide and Flashcards
AP Bio exam date: 8:00 AM Friday, 5/14/2021

Materials:

- ❏ 1 notebook to write & organize notes
- ❏ RPS student kit (provided by RPS)
- ❏ Graphing calculator (provided by RCHS)
- ❏ RCHS science kit (provided by RCHS)
- ❏ AP Bio science kit (provided by RCHS)

Introduction and Purpose:

AP Biology is designed to be the equivalent of a college introductory biology course. The breadth of topics covered is wide, providing a strong foundation for upper level life science courses. The class is conducted at the college level and students are expected to work accordingly. AP Biology differs significantly from a traditional high school biology course in regards to time, effort, commitment, and motivation required from the students.

This course is designed to be taken by students after successful completion of high school biology and chemistry. At the completion of this course, students are expected to take The College Board's AP exam. Students are expected to demonstrate critical thinking skills through their answers to both multiple choice and essay questions. In addition, the web-based platform Canvas will be used, students will be expected to maintain an interactive notebook, and to complete formal lab reports. Students will learn how to synthesize their thoughts into formal lab reports and projects.

Expectations:

All students must adhere to the RCHS and class rules:

- Respect our time - be logged into the Google Classroom meeting by start of class
  - stay in the Google Meet until dismissed!
- Be present - no distractions while we are together (e.g., your phone!)
- Respect one another - the Golden Rule is the keystone of our classroom community
- Cooperate and participate - YOU are a vital part of this course!
- **Ask for help!!!** I am here to help, so please take advantage of that as a resource!

Life in the Virtual Classroom

For the virtual classroom, we will use Google Classroom as our main hub of activities and assignments. The class meeting (video) link can be found in the top banner of our "class stream" page. For days that we have planned to meet, it is essential that you join the meeting on time and free yourself of distractions. Our goal is to build a strong classroom community, just as we would in person. A major part of this is your presence and engagement with the class, with me, and with your fellow scholars. To optimize our experience, please mute your microphone when not speaking to the class! I also ask that you keep conversation in the chat bar on-topic and to a minimum.

NOTE: If your instructor loses connection during a class meeting, you will receive an email with instructions on what to do that day. If you lose connection during class time, simply email the instructor to let them know and get the materials you need to catch up.

Grading

Grades will be based off of a percentage grade system:

40%: Assessments (tests, projects)
30%: Virtual labs & digital interactives
30%: All other assignments

Late Work Policy:

Students are expected to submit all work on time. A penalty will be imposed when assignments are not submitted on time. **For each day late without a legitimate, written excuse, 10% will be deducted from the grade. Assignments will not be accepted after one week beyond the initial due date.**

Honor Code:

All RCHS students are expected to follow the school's honor code. **Students caught cheating, copying work, allowing others to copy their work, or plagiarising the work of others will be reported to the RCHS Honor Council.** The purpose of this policy is to maintain fairness and foster the skills necessary to compete in college and future careers.

Laboratory Investigations:

Laboratory and field investigations are designed to complement the lecture portion of the course by providing opportunities to learn about the natural world through firsthand observations, to test concepts and principles which have been introduced in class, to explore specific issues and problems in greater depth, and to gain an awareness of the importance of confounding variables which exist in the real world.

Investigations will be diverse and will include virtual labs, lab demonstrations, and group and individual research projects. The labs are designed to invite students to think critically, to observe natural systems, to analyze and interpret data, to present data orally and in the form of statistical and graphical presentations, to apply concepts to the solution of environmental problems, to form conclusions and to propose further study.

This year, most of our labs will be virtual or video demonstrations. However, in cases where students have the option to conduct at-home labs and field research, **all students are expected to follow all lab safety rules**. If you are absent for a guided lab or lab demo, you must contact the teacher within 2 days of your absence and make arrangements to complete the lab.

Attendance, Tardiness and Absences:

Due to online learning, attendance will look slightly different this semester. Students must still try to attend every scheduled class meeting. We will still be taking notes and working through activities together, so tardiness and absences can have on your academic progress. However, some days we may not meet for a full class period, and students will submit work or a Google Form in lieu of a traditional roll call (teacher will let students know ahead of time).

Students are responsible for securing missed assignments and/or notes. If you miss an assignment, test, quiz or lab, it is your responsibility to make it up ASAP. Extenuating circumstances should be discussed with the teacher and substantiated by a written note from your parent/guardian. All planned absences should be shared with the teacher ahead of time and all assignments gathered before leaving. All assignments should then be submitted upon your return.

Saturday Sessions:

Students will be required to attend AP College Board Saturday sessions toward the end of spring semester, based on their choosing. During these sessions, students will have the opportunity to take a full length AP exam and review for the test. These are extremely valuable opportunities for study and learning, and are taught by AP teachers from across the country.

AP Biology Single Block:

We are on a single block schedule, which means we have a lot to cover in a short amount of time! Some days we will do labs, and other days we will do activities to help you prepare for the AP exam. It is imperative that you keep up with your assignments in and outside of class so that you do not fall behind - we will be chugging right along!

My Goals for This Course:

1. We work together and learn from one another
2. You learn *how* to think
3. You practice organizational skills and time management
4. You enjoy science and how to apply it to other topics
5. You pass the AP exam
6. We have fun and learn a lot!

- Complete the Student & Guardian Contract on Next Page -

Contact/Permission/Lab Contract Form for AP Biology

Student:

I have read, understand and agree to the course syllabus, expectations, and all safety rules from Ms. Spencer's AP Biology class. I understand the high level of student independent effort required to succeed in this class. I understand that failure to abide by safety regulations will result in my dismissal from the lab or field study and that I will be unable to complete these assignments. I understand that I must attend all mandatory after school workshops, labs and review sessions. I understand that late assignments will result in reduced credit, and late assignments will not be accepted after one week.

Parent:

I have read, understand and agree to the course syllabus, expectations, and all safety rules from AP Biology class. I understand the high level of student independent effort required to succeed in this class. I understand that my child's failure to abide by safety regulations will result in their dismissal from the lab or field study and that they will be unable to complete these assignments. I understand that my child is required to attend all mandatory after school workshops, labs and review sessions. I understand that if my child turns assignments in late, this will result in reduced credit, and late assignments will not be accepted after one week. **I give permission for my child to participate in this course's laboratory and outdoor field studies near and around their home.**

Printed student name _____ Block _____

Student address _____

Student g-mail address _____

Student phone number(s) _____

Parent or guardian printed name _____

Parent e-mail address _____

Parent phone number(s) _____

Student signature _____ Date _____

Parent signature_____ Date _____

Please list any allergies that your child has, and indicate if your child wears contacts.

Allergies _____

Does student wear contacts? ____ Yes ____ No

Fall 2020 AP Bio Unit Outline

1. **Biochemistry**
   - 1.1. Structure of water, hydrogen bonding
   - 1.2. Elements of life
   - 1.3. Introduction to biomolecules
   - 1.4. Properties of biomolecules
   - 1.5. Structure and function of biomolecules
   - 1.6. Nucleic acids

2. **Cell Structure and Function**
   - 2.1. Subcellular components
   - 2.2. Cell structure and function (i.e., the diversity of cells)
   - 2.3. Cell size
   - 2.4. Plasma membranes
   - 2.5. Membrane permeability
   - 2.6. Membrane transport
   - 2.7. Facilitated Diffusion
   - 2.8. Tonicity and osmoregulation
   - 2.9. Mechanisms of transport
   - 2.10. Cell compartmentalization
   - 2.11. Origins of cell compartmentalization

3. **Cellular Energetics**
   - 3.1. Enzyme structure
   - 3.2. Enzyme catalysis
   - 3.3. Environmental impacts on enzyme function
   - 3.4. Cellular energy
   - 3.5. Photosynthesis
   - 3.6. Cellular respiration
   - 3.7. Fitness

4. **Cell Communication and Cell Cycle**
   - 4.1. Cell communication
   - 4.2. Introduction to signal transduction
   - 4.3. Signal transduction
   - 4.4. Changes in signal transduction pathways
   - 4.5. Feedback
   - 4.6. Cell cycle
   - 4.7. Regulation of the cell cycle

5. **Heredity**
   - 5.1. Meiosis

5.2. Meiosis and genetic diversity
5.3. Mendelian genetics
5.4. Non-Mendelian genetics
5.5. Environmental effects on phenotype
5.6. Chromosomal inheritance

6. Gene Expression and Regulation

6.1. DNA and RNA structure
6.2. Replication
6.3. Transcription and RNA processing
6.4. Translation
6.5. Regulation of gene expression
6.6. Gene expression and cell specialization
6.7. Mutations
6.8. Biotechnology

7. Natural Selection

7.1. Introduction to natural selection
7.2. Natural selection
7.3. Artificial selection
7.4. Population genetics
7.5. Hardy-Weinberg equilibrium
7.6. Evidence of evolution
7.7. Common ancestry
7.8. Continuing evolution
7.9. Phylogeny
7.10. Speciation
7.11. Extinction
7.12. Variations in populations
7.13. Origin of life on Earth

8. Ecology

8.1. Responses to the environment
8.2. Energy flow through ecosystems
8.3. Population ecology
8.4. Effect of density of populations
8.5. Community ecology
8.6. Biodiversity
8.7. Disruptions to ecosystems