LEARNING UNLIMITED PREPARATORY SCHOOL

**AP BIOLOGY 2021 - 22 SYLLABUS**

**Instructor:** Ms. Beland **Room Location:** Room G

**Email:** sbeland@luschool.com **Course Website:**msbeland.weebly.com

**Course Description**

This year-long study of biology is an introductory biology course taken usually taken by biology majors during their first year of 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 from their prospective post-secondary institution, 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.

**Course Content**

AP Biology is structured around **four big ideas and associated science practices**, the enduring understandings within the big ideas, the essential knowledge within the enduring understandings, and the essential associated skills.

**Science Practices:**

**#1** – Concept Explanation

**#2** – Visual Representations

**#3** – Questions and Methods

**#4** – Representing and Describing Data

**#5** – Statistical Tests and Data Analysis

**#6** – Argumentation

**The Big Ideas:**

**Big Idea 1:** EVOLUTION [EVO] 🡪 The process of evolution drives the diversity and unity of life.

**Big Idea 2:** ENERGETICS [ENE] 🡪 Biological systems utilize free energy and molecular building blocks to grow, to reproduce and to maintain dynamic homeostasis.

**Big Idea 3:** INFORMATION STORAGE & TRANSMISSION [IST] 🡪 Living systems store, retrieve, transmit and respond to information essential to life processes.

**Big Idea 4:** SYSTEMS INTERACTIONS [SYI] 🡪 Biological systems interact, and these systems and their interactions possess complex properties.

**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 eight inquiry-based investigations (two per big idea throughout the course). Additional labs and activities may 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.

**Required Texts**

Reece, Jane B., et al. *Campbell Biology (10th Edition)*. San Francisco: Pearson Education, 2014.

*(ISBN-13: 978-0-321-77565-8/ISBN-10: 0-321-77565-1 or* ISBN-13: 9780321974730 *for digital version)*

**Pacing (in accordance with textbook)**

|  |  |  |
| --- | --- | --- |
|  | **Campbell & Reece, AP, 10th Ed** |  |
|  |  |  |
| INTRO | Evolution, the Themes of Biology & Scientific Inquiry |  |
|  |  |  |
| **I.** | **The Chemistry of Life** |  |
| Ch 2 | The Chemical Context of Life |  |
| Ch 3 | Water and Life |  |
| Ch 4 | Carbon & the Molecular Diversity of Life |  |
| Ch 5 | The Structure & Function of Large Biological Molecules | END OF Q1 |
|  |  |  |
| **II.** | **The Cell** |  |
| Ch 6 | A Tour of the Cell |  |
| Ch 7 | Membrane Structure & Function |  |
| Ch 8 | An Intro to Metabolism |  |
| Ch 9 | Cellular Respiration & Fermentation |  |
| Ch 10 | Photosynthesis |  |
|  |  |  |
| Ch 11 | Cell Communication |  |
| Ch 12 | The Cell Cycle |  |
| Ch 47 | Animal Development |  |
| Ch 48 | Neurons, Synapses & Signaling |  |
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| **III.** | **Genetics** |  |
| Ch 13 | Meiosis & Sexual Life Cycles |  |
| Ch 14 | Mendel & the Gene Idea |  |
| Ch 15 | The Chromosomal Basis Inheritance | END OF Q2 |
| Ch 16 | The Molecular Basis of Inheritance |  |
| Ch 17 | From Gene to Protein |  |
| Ch 18 | Regulation of Gene Expression |  |
| Ch 19 | Viruses |  |
| Ch 20 | DNA Tools & Biotechnology |  |
| Ch 21 | Genomes & Their Evolution |  |
|  |  |  |
| **IV.** | **Mechanisms of Evolution** |  |
| Ch 22 | Descent with Modification: A Darwinian View of Life |  |
| Ch 23 | The Evolution of Populations |  |
| Ch 24 | The Origin of Species |  |
| Ch 25 | The History of Life on Earth |  |
|  |  |  |
| **V.** | **The Evolutionary History of Biological Diversity** |  |
| Ch 26 | Phylogeny & the Tree of Life |  |
|  |  |  |
| **VII.** | **Animal Form & Function** |  |
| Ch 40 | Basic Principles of Animal Form & Function |  |
| Ch 43 | The Immune System |  |
| Ch 45 | Hormones & the Endocrine System |  |
| Ch 49 | Nervous Systems |  |
| Ch 50 | Sensory & Motor Mechanisms |  |
| Ch 51 | Animal Behavior | END OF Q3 |
|  |  |  |
| **VIII.** | **Ecology** |  |
| Ch 52 | An Introduction to Ecology & the Biosphere |  |
| Ch 53 | Population Ecology |  |
| Ch 54 | Community Ecology |  |
| Ch 55 | Ecosystems & Resotration Ecology | LECTURE ENDS 03.31.2022 |
|  |  |  |
|  | \*These chapters may be covered cursorily. |  |

**Highly Recommended Texts**

* Holtzclaw, Fred W., and Theresa Knapp Holtzclaw. *AP Test Prep Series: AP Biology*. San Francisco: Pearson Education, 2014. Print.

**Additional Materials and Equipment**

* Recommended: notebook (spiral or binder), pen (blue/black ink), calculator, ruler
* Laptop

**Assignments**

Students will be regularly assigned homework, in-class activities, lab exercises and reports, study guides, quizzes, and exams. Assignments may include physical and virtual handouts, web activities, online quizzes, and both individual (AP Personal Progress Checks) and group work. Student expectations are high for this course. You should plan to study 1+ hours outside of class for every hour in class. We will cover 2-3 chapters per week and will have multiple choice and free response exams on a regular basis.

*New!!* AP Personal Progress Checks – are formative assessments designed by College Board to enable you to check your own understanding of particular concepts within a specific unit. Each Personal Progress Check contains formative multiple-choice and free-response questions. The feedback will show the areas where you need to focus.

**Unit Testing and THE Exam**

Students should expect weekly assessments, in the form of quizzes and chapter/unit tests. Chapter/unit tests will consist of two parts: (1) questions directly associated to the material from the textbook; (2) questions similar to APES multiple choice section.

The APES Exam is a three-hour long examination, consisting of two parts: (1) multiple choice selection of **69** questions, worth 50% of the grade; and (2) free-response (FRQ) section consisting of **eight** questions, worth 50% of the grade. The multiple choice and free-response sections are each allotted 90-minutes. The number of multiple-choice questions taken from each major topic area is reflected in the percentage of the course as designated in the outline of topics. The free-response questions consist of 2 long questions, one of which is lab- or data-based; the 6 short-answer questions will each require a paragraph-length argument/response. The short-answer questions are designed to assess the students’ understanding of: scientific investigation, conceptual analysis, analysis of a model or visual representation and data analysis.

A four-function (with square root), scientific calculator may be used on the exam.

AP Biology Exam is originally scheduled for **May 16, 2022 (morning).**

**AP Biology Topic Outline**

The following is an outline of the topics will be covered during this course. The percentages indicate the approximate emphasis that will be placed on that topic area both in this course and on the AP Biology exam in May. The sequence of topics is approximate.

• UNIT 1: Chemistry of Life (8-11%)

• UNIT 2: Cell Structure and Function (10-13%)

• UNIT 3: Cellular Energetics (12-16%

• UNIT 4: Cell Communication and Cell Cycle (10-15%)

• UNIT 5: Heredity (8-11%)

• UNIT 6: Gene Expression and Regulation (12-16%)

• UNIT 7: Natural Selection (13-20%)

• UNIT 8: Ecology (10-15%)

**Grades**

Total points earned per term are weighted as follows:

* Assignments: Classwork, labs, homework, participation – 50%
* Assessments: Quizzes, exams, projects – 50%

Your final grade is composed of:

* Summative Exam (mid-term) = 20%
* Terms (I, 2, 3, 4) – 20% each = 80%

Assignments will NOT be curved. Effort will be made to return graded assignments within one week from when it was collected. Regular exams are worth 100 points. Exams that have a class average of less than 70% may be curved at the instructor’s discretion. Final class letter grades are earned based on the sum of the weighed percentages.

**Grading Scale**

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| --- | --- | --- | --- | --- |
| **90-100% A** | **80-89% B** | **70-79% C** | **65-69% D** | **Below 65% F** |

Grades are rounded to the nearest integer. Individual grade reports will be given to students periodically and students may monitor their progress via PowerSchool.

**Course Policies**

* During Quarter 1, late work will receive a 10% per day grade reduction penalty. During Quarters 2-4, late work will NOT be accepted. Please speak with me to resolve problems you encounter (*before* the due date!).
* Class attendance and participation is essential for success. It is your responsibility 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 excused absence time frame of 2 days per 1 day absent.
* Assignments must be turned in at the beginning of class on the due date or by the date/time indicated.
* Requests for exceptions to these policies must be discussed with me in advance.
* Students are to submit only their own work for evaluation, to acknowledge the work and conclusions of others, and to do nothing that would provide an unfair advantage in their academic efforts. Students who fail to comply with the LUPS Disciplinary Code are subject to disciplinary action.
* Plagiarism and cheating will NOT be tolerated and may lead to failure on an assignment, in the class, or loss of credit for the class. Please cite references using MLA format.

**Student Success**

* Doing the reading assigned for each class before coming to class is necessary to benefit from what we do in class. The course calendar (to be posted later) will indicate the dates by which reading assignments should be completed **before** class.
* Lecture PowerPoint presentations, reading guides and extraneous resources that accompany the content in your Campbell Biology book will be shared digitally.
* I may need to contact you between classes through individual and group email messages. You are responsible for any messages, including assignments and schedule changes, I send via email or Google Hangout Chat. You also may contact me via email at sbeland@luschool.com.

**Classroom Rules**

* Turn off cell phones and mp3 players during class. NO ear buds! Approved digital devices, with signed consent form, may be utilized during class.
* All policies set forth in the LUPS Student Handbook must be adhered.
* Safety is a primary concern and all students must comply with the Laboratory Safety Contract.

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| AP Biology will be a challenging and powerful learning experience and I am excited to be a part of this learning community with you. I am committed to help 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.  ~*Ms. Beland* |

STUDENT LAB SAFETY CONTRACT

This contract will be covered with the students, and it makes students aware of the basic rules and their purpose. The student will review these basic rules and have an opportunity to ask questions. The student will then be asked to sign this contract, thereby agreeing to abide by these rules and any additional safety directions given by the science instructor or school administration.

**THE PURPOSE OF THE CONTRACT IS TO MAKE THE STUDENT AWARE OF HIS OR HER RESPONSIBILITY FOR LABORATORY SAFETY.**

Students should also realize the implications of improper behavior. For example, in the United States, courts have ruled that students can be just as guilty of negligence as teachers in laboratory accidents.

STUDENTS MUST:

1. Read the lab. Students will also listen to and follow all instructions given by the teacher.
2. Protect eyes (wear goggles), face, hands, and body when involved in science experiments.
3. Carry out good housekeeping practices.
4. Know where to get help fast.
5. Know the location of safety equipment (first aid, eye wash, fire blanket, fire exits, fire alarm pull, fire extinguisher, safety shower, lab aprons, and goggles).
6. Take the responsibility to conduct themselves in a responsible manner at all times. They will use the lab equipment and computers in a responsible manner.
7. Wash their hands after lab activities and before they leave the classroom.
8. Use lab activities as an instructional and integral part of their learning activity.
9. Stay aware that some of the materials that they will be working with can damage their clothes and body tissues.
10. Respect that this room is a SAFE ZONE. They will not harass, degrade, spread rumors, humiliate others for any reason; these may include ethnic background, religion, gender, age, disability, orientation, choice of apparel, thoughts, and friends or associates.

**When you have read and agree to comply with the lab safety rules set forth in this contract, please sign and date the AP Biology class contract. Students who sign the contract agree to closely follow the oral and written instructions provided by the teacher and/or the school administration.**

*Please note: For the safety of the other students and the instructor, no labs will be performed or credited without this completed contract of awareness and responsibility.*

STUDENT NAME:

STUDENT SIGNATURE:

DATE: