**Mrs. Varsha Radhakrishnan, Rm 201**  Conference: 1:55 to 2:50 pm/7th period
Tutorials: Wednesdays (2:50-3:30pm) and (6:50-7:20am)

Phone: 281-329-2419

Email: varsha.radhakrishnan@fortbendisd.gov

**Textbook:** *Campbell Biology in Focus for AP Edition (3e)*

**Course Description:** AP Biology is a **2-semester 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. 25% percent of instructional time is devoted to hands-on laboratory work with an emphasis on inquiry-based investigations. These inquiries 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. As a college level course, the amount of material covered as well as the complexity of the topics will be high. It is the responsibility of the student to come to class each day understanding the previous day's material. Students must be certain that they are willing to accept this challenge and be committed to keep up with the work. **Student should be ready to put in an additonal 2-5hrs /week for this course.**

**Required Course Materials:** Electronic Device (Laptop with charger), binder with lined loose leaf paper, 10 dividers, glue stick, scientific calculator (for HW), pens, pencils, eraser, highlighters, sharpie and colored pencils/markers.

AP Biology at our school will focus on the big ideas. Each unit is organized and taught with great attention to the Big Ideas below. Lessons are designed to interweave the Big Ideas throughout the course. The Big Ideas are:

* Big Idea #1: The process of evolution drives the diversity and unity of life.
* Big Idea #2: Biological systems utilize energy and molecular building blocks to grow, reproduce, and maintain homeostasis.
* Big Idea #3: Living systems retrieve, transmit and respond to information essential to life processes.
* Big Idea #4: Biological systems interact, and these interactions possess complex properties.

The AP Biology course is structured around inquiry in the lab and the use of 6 science practices throughout the course.

* Science Practice 1: Concept Explanation
* Science Practice 2: Visual Representations
* Science Practice 3: Questions and Methods
* Science Practice 4: Representing and Describing Data
* Science Practice 5: Statistical Tests and Data Analysis
* Science Practice 6: Argumentation

**Course Planner:**

AP Biology is organized into eight units. Every unit is designed to integrate the topic into the four big ideas and the essential knowledge within the enduring understanding. Throughout each unit, we discuss how the unit ties back into all of the big ideas.

\**Disclaimer: Intructor can change/edit the course planner any time as needed\**

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| **Unit**  | **Topics**  | **Reference**  | **Laboratories**  |
|  |  |  |  |
| 1- Biochemistry  Covered in Term 1 | Water, bonding, pH, macromolecules, Protein structure and function, enzymatic activity  | POL CH 2-3 Campbell CH 2-5  | Penny labEnzyme Lab  |
| 2-Cell structure, function and cell communication Covered in Term 1 | Prokaryotes vs Eukaryotes, Cell organelles (structure and function), Cell membrane (structure and function), Signal transduction pathways, G-proteins, Tyrosine kinase, role of membranes in cell signaling, secondary messengers  | POL CH 4-5, 7 Campbell CH 7-8, 11  | Diffusion/Osmosis Lab Agar labStarch/iodine diffusion lab  |
| 3- Cellular Energy (metabolism/Cell Respiration/ Photosynthesis) Covered in Term 2 | Metabolism, ATP, Cell respiration, Photosynthesis, evolution of alternative mechanisms of carbon fixation  | POL CH 6 Campbell CH 6, 9-10  | Cell Respiration Lab (probeware) Leaf disk assay/photosynthesis Lab  |
| 4- Cell Cycle, Mitosis, DNA structure, Replication, Biotechnology Covered in Term 2& 3 | Mitosis/cell cycle, DNA structure & replication, Recombinant DNA, Restriction enzymes, Bacterial Transformation, DNA gel electrophoresis  | POL CH 7, 9, 13 Campbell CH 12, 16, 20  | Mitosis lab – chi square Strawberry DNA extractionBacterial Transformation (glowing bacteria) |
| 5- Protein Synthesis Prokaryotic and Eukaryotic Gene Regulation Covered in Term 3 | Protein Synthesis, Gene regulation (prokaryotic and eukaryotic)  | POL Ch 10-12 Campbell CH 17-19  | Protein Synthesis/Mutation Lab – online   |
| 6- Meiosis and Mendelian Genetics Covered in Term 3 | Meiosis and reproduction Mendelian inheritance patterns, non-mendelian inheritance patterns, Chi-square analysis, evolutionary significance of genetic variation, gene linkage  | POL CH 8-9 Campbell CH 14-15  | Chromosome mapping – fruit fly lab. |
| 7 - Evolution Covered in Term 4 | Origin of life, Darwin & decent with modification, origin of species, adaptations, speciation, behavior patterns, genetics, sexual selection and reproductive success, phylogeny and the tree of life, Bacteria and Archaea | POL CH 15-19 Campbell CH 22-28  | BLAST lab HHMI Evolution/Genetics Lab online  |
| 8 –Ecology Covered in Term 4  | Interactions between organisms and the environment, ecosystems, conservation, animal behavior  | POL CH 41-46 Campbell CH 50-55  | Energy Dynamics Animal Behavior Ecological Succession  |

**Evaluation:**

**Tests:** Students will receive grades on homework, quizzes, laboratory work, projects, notebook organization skills and exams. Unit Exams are typically worth 100 points and will consist of questions similar to those seen on the AP Exam (timed). Typically, each unit test consists of 20 MCQs (25 min) and 5-10 FRQs (25min). The final exam score is out of 30 pts typically.

**HWs:** Homework assignments are usually given for each unit covered. They are online on their textbook site (Pearson mastering biology website) and students get about a week and 2 chances to score a 100 on their HW. After due date, HWs cannot be made up and they will score a 0.

**Quizzes:** Quizzes will consist of what was discussed in class and there are no retakes for quizzes.

**Lab reports/Lab notebooks:** Students are expected to be able to communicate clearly and concisely in writing as communication is one of the founding principles of science. All lab reports will require students to analyze a problem, state a claim, provide a reason for the claim, and then justify the claim with evidence. Proper grammar and correct spelling are required with some leniency.

**Binder**: A binder or an organizer is required as maintaining a record of what a student has done is also a founding principle of science. Students will be required to keep organized various graded and ungraded work. Binder/organizers will be checked every 9-weeks (cannot be dropped). Instructor will check for warmups, Quizzes, Lab papers and other graded work.

**Make up Guidelines**:

* It is the student’s responsibility to schedule make up assessments, presentations and labs. These should be made up promptly. The window for making up labs is very small due to space and the short life of lab materials.
* If a student is absent any day during a unit (including the day before the test), the student is still required to take the test on the given day.
* If a student is absent the day of a test or quiz, the student should attempt to make up the test or quiz the next day. If you do not make up the test or quiz within the time frame outlined in the Student’ Rights and Responsibilities Handbook, the instructor may give you a zero for the test. It is not fair to other students in the course to give you extended time to study and prepare for a test. **Absences must be excused. If unexcused, I need an email from the parent for the absence and your test will be a different make up test.**
* Deadlines are posted for each assignment and the student is required to turn in assignments on time. Late work is -15 on the first missing day and -30 for 2nd day and is 0 after that.

**Classroom Expectations and procedures:**

The student will…

* Be responsible for one’s own property and behavior.
* Observe and follow rules stated in the student handbook.
* Bring required materials to class daily.
* Be prepared for class or lab by completing the required readings or assignments ahead
* of time.
* Turn in all assignments on time.
* Be on time for class.
* Refrain from eating or drinking in class. (Remember you are in a science lab.)
* Refrain from using cell phones or other electronic devices for the purposes of
* communication or entertainment.
* Cell phones must be turned in for all quizzes and tests or when any test material is out.
* Refrain from touching any equipment unless instructed to do so by the instructor.
* Read, understand, sign and return the safety contract
* Stay awake and participate appropriately in class.

**Failure to comply with classroom behavioral expectations will result in…**

* Teacher/student conference (hopefully this is where it ends)
* Contact with parents (next step)
* Referral to appropriate administrator (last resort)

**AP Biology Exam:**

* Students are expected to take the AP exam. The AP exam scores are not received until early July. These scores are therefore not used as a part of a student’s average in the course. The paper and pencil-based AP biology exam will be in May and can be taken at the school. More information will be provided in class. **This year, AP biology is the first exam- May 5th, 8 a**m. The exam will be hybrid type- MCQs will be online and FRQs will be handwritten.

*\*\*\*Disclaimer: This syllabus is a living document and subject to change at any time by the discretion of the instructor.*

 **STATEMENT OF UNDERSTANDING**

By completing, submitting and the AP Biology 2023-2024 STATEMENT OF UNDERSTANDING page, the parent/guardian and the student are acknowledging that they have read the course syllabus for Mrs. Radhakrishnan’s AP Biology class, and they understand and agree to the commitment necessary to be successful in this course, especially regarding work that needs to be completed outside of the classroom. **Student knows that he/she needs to be able to put in about 3-5hrs of work outside the classroom/week for this course.**

 They also acknowledge that **cheating** and/ **plagiarism** (including copy pasting from the internet or without paraphrasing) is unacceptable for this course and student will be given a zero. This rule applies not just during testing but also for HW and other class assignments. There is NO second chance to make up that grade. There will be weekly HWs online and progress checks on AP classroom. Students are REQUIRED to log in and complete assignments on both websites. **There is no make up for HWs, quizzes or progress checks**. Retests are offered for Unit exams only (major grade). There is no extra-credit to bring up your grade in AP biology. **Managing your time is crucial for being successful in this course.**

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*Printed student name / Period*

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*Signature of student / Date*

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*Signature of parent or guardian / Date*

**SUPPLIES REQUIRED for Mrs. RAD’s AP BIO CLASS (by Monday 08/14/2023)**

*1.5 INCH BINDER (FOR CLASS USE) and 10 dividers*

3 INCH BINDER (FOR HOME)- use an old binder/no need to buy if you have one.

Notebook paper and graph paper.

You should have your own pencils, erasers, markers, sharpies, highlighters and color pencils for your personal use during class time.

Please donate if you can:

Printer paper (white)