Summer 2024 Course Proposal: Biotechnology

Instructor:

- Alex da Silva

Target Students:

- Rising 11th, or 12th-grade student who has taken one year of chemistry
- Students interested in biotechnology, and those interested in health careers

Purpose:

- The practical applications of biotechnology can be seen all around us, healing, feeding and fueling the world.
- Freeing up space so students can take other science electives during the school year.

Format:

- Hybrid, Coursework will be done online with 1 class session a week either in on of the labs or via zoom.

Description:

Course Description: This course provides exploratory experience combining laboratory and real-life applications in the field of biotechnology. The content includes, but is not limited to, the following:

- The nature of science
- Matter, energy, chemical processes of cells, organisms
- Cell molecular structure and function, membranes, DNA, plasmids, reproduction, communication
- Fundamentals of biochemistry, protein synthesis, germ theory,
- Molecular genetics and biotechnology, restriction digest, DNA analysis, PCR
- Levels of organization, molecular to organismal, classification, and taxonomy
- Interdependence of organisms, humans, and the environment,
- Genetic diversity, selection, adaptations, and changes through time
- Bioethics
- Connection between Biotechnology, agricultural, food, and medicine and careers

This course shall integrate the Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate to the content and processes of the subject matter. Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental quality, and safety procedures will be an integral part of this course. Students will interact with materials and primary sources of data or with secondary sources of data to observe and

understand the natural world. Students will develop an understanding of measurement error, and develop the skills to aggregate, interpret, and present the data and resulting conclusions.

Calendar:

- 8 Weeks: June 3rd – July 26th.
    - Students will complete 1 canvas module a week. Students will have an online content presentation, a discussion post, a vocab assignment, a formative quiz and a reading with guided notes. The formative quiz will have two attempts per week.

Meet in the science lab every Wednesday

Students are expected to attend all 7 class sessions. No more than 1 class session can be missed.

No Class the week of the 4th of July.

Lab, speakers, and learning activities.

Final Project:

Presentations will be scheduled and conducted via Zoom or in person during the last week of school. All assignment activities will be due via Canvas on July 25.