Department: Science
Course Name: Advanced Placement Biology
Seniors only

Course Description:
AP Biology is a comprehensive course for science majors, accompanied by a laboratory block. Lectures, laboratory investigations, and class discussions emphasize biological concepts and processes. AP Biology is arranged around four main ideas: evolution drives diversity and unity of life; biological systems use free energy to maintain homeostasis; living systems store, transmit, and respond to essential information to life, and biological systems interact, and these interactions have complex properties. Biological interactions and biological transformations of free energy are taught in the first semester. The second semester addresses how living systems store and respond to information essential to life and evolution. Prerequisites for this course include chemistry and an introduction to biology course. AP Biology students complete a minimum of 12 major lab reports and several projects during the course. This course requires a double block to ensure sufficient lab time.

Content:
Scientific method-inquiry labs; design their own labs
Basic carbon chemistry; water properties; pH
Macromolecules-structure, bonding, function
Cell structure/function from molecular level
Metabolism-thermodynamics; enzymes
Chromosomal basis of inheritance
Molecular basis of inheritance
DNA replication and translation
Regulation of gene expression
Viruses; viral inheritance patterns
Biotechnology-recombinant DNA
Population/community ecology
Restoration ecology
Evolution of genomes
Evolution of populations
Origin of species

Skills:
Utilize a learning management system for accessing content, assignments, and assignment submissions.
Analyze data using statistical tests, by hand or with a statistical application.
Graph or chart data in spreadsheets.
Utilize a variety of lab techniques.
Use microscopes of different kinds for different purposes.
Identify variables, create methods, analyze and draw conclusions from student designed Experiments.
Organize information to create flow charts or other graphic representations.
Tex and Materials:
Morris, J., Castignetti, D., Lepri, J., & Relyea, R. *Biology for the AP Course*. BFW Publishers, 2022.

Methods of Instruction:
Class discussion with emphasis on integrating and analyzing data
Laboratory experiments-emphasis on inquiry based laboratory experiences
Data analysis with computer graphing and computer apps for statistical analysis
Lecture with focus on developing critical thinking
Demonstrations illustrating methods of experimentation

Methods of Evaluation:
Laboratory reports
Critical thinking essays
Tests, either on paper or with online assessment applications
Quizzes, either on paper or with online assessment applications
Models and other graphic representations