

Saint Joseph High School Summer Institute

Course: 120 Hour Honors Biology/ Biology

Required materials for class each day:

- Notebook/Binder
- Folder
- Pens/Pencils/Highlighters
- Calculator

Course Topics: Order may vary; *AP Bio topics may be introduced

1. Ecology
 - a. Levels of Organization and Energy in an Ecosystem
 - b. Biogeochemical Cycles and impact on ecosystems
 - c. Food Chains, Food Webs, and Invasive Species
 - d. Community Interactions
 - e. Population Density and Growth Patterns
 - f. Human Impact on the Ecosystems
 - g. Animal Behavior*
2. Biochemistry
 - a. Basic Structure of the Atom
 - b. Atomic Symbols and elemental characteristics (# of protons/electrons/neutrons)
 - c. Balancing Chemical Equations
 - d. Chemical Bonding (Ionic, Covalent, and Hydrogen)
 - e. Biomolecules (Structure and Function of Carbohydrates, Lipids, Proteins, and Nucleic Acids)
 - f. Enzyme
3. Basic Cell Structure and Function
 - a. Types of Cells and compartmentalization of reactions (Organelles)
 - b. Diffusion
 - c. Osmosis
 - d. Water Potential*
 - e. Active Transport
4. Cells and Energy
 - a. Photosynthesis (Light Reactions/Calvin Cycle)
 - b. Transpiration
 - c. Plant Hormones*
 - d. Cellular Respiration (Aerobic vs. Anaerobic)
 - e. Fermentation in production of foods
 - f. Interdependence of photosynthesis and cellular respiration
5. Cell Growth and Division
 - a. DNA Replication
 - b. Mitosis
 - c. Regulation of Cellular Division/Mitosis
 - d. Cancer, Animals, and Treatments
6. Molecular Genetics
 - a. DNA → RNA → Amino Acids

- b. Regulation of Gene Expression
 - c. Disease
 - d. Biotechnology
7. Heredity
- a. Meiosis
 - b. Genes and Alleles
 - c. Heredity Patterns (Mendelian and Non-Mendelian)
8. Evolution
- a. Early Ideas and Darwin
 - b. Genetic Variation and Evolution of Populations
 - c. Hardy-Weinberg Equilibrium and Calculations
 - d. Evidence for Evolution
 - e. Cladograms and Phylogenetic Trees*
 - f. Current Examples of Evolution

Assessments:

- Homework (Review Questions and Worksheets)
- Classwork (Labs, CER, POGILs)
- Quizzes, Tests, Final Exam

Resources:

- Biology Textbook
- Flinn POGILs
- [Crash Course Biology](#)
- [Bozeman Science](#)
- [Amoeba Sisters](#)
- [Biointeractive](#)