BIOL& 222 : Molecular & Cellular Biology with Lab

Credits 5
Quarter Offered Winter
Second course in the three-quarter sequence of introductory biology for science students. Introduction to structure and function of biomolecules, cells, and membranes; photosynthesis and respiration; molecular origin of life; phylogenetic and metabolic diversity of prokaryotes; and molecular genetics and genomics. This class may include students from multiple sections. (Natural Sciences with Lab, Elective)
Prerequisites
BIOL& 221 (minimum 2.0)
Course Outcomes

Read, correctly interpret, and critically evaluate biological information in books, journals, online resources, and the popular media.
Explain and give examples of the basic themes and concepts of the chemistry of life including basic cell chemistry, properties of water and pH, basic organic chemistry, and properties of organic macromolecules (carbohydrates, lipids, proteins, and nucleic acids).
Explain and give examples of the basic themes and concepts of cell biology including cell structure and function, membrane structure and function, metabolism and enzyme function, respiration and fermentation, photosynthesis, cell communication, and mitosis.
Explain and give examples of the basic themes and concepts of genetics including meiosis and sexual life cycles, Mendelian genetics, chromosomes and non-Mendelian genetics, function of DNA (synthesis, transcription, and translation), regulation of gene expression, DNA tools and biotechnology, and genomes and their evolution.
Explain and give examples of the evolution and diversity of viruses, bacteria, and protists.
Apply quantitative analysis to solve problems in hypothetical and real situations.
Demonstrate ability to process information and experiences in the form of laboratory write-ups and project presentations to convey findings of library research and/or scientific inquiry using appropriate language, format, and graphical methods.
As a group (3-6 students) design and conduct a scientific exploration, interpret results, and explain findings in a logical and appropriate manner using critical thinking and problem solving skills.
Describe connections of the covered concepts of biology to their local environments and daily lives.