



C-ID Descriptor

Cell and Molecular Biology

Descriptor Details

- **Descriptor Title:** Cell and Molecular Biology
- **C-ID Number:** 190
- **Units:** 4.0
- **Hours:** 0000
- **Date of Last Revision:** 12/19/2023 05:38:22 PM GMT+0000

General Description

This course, intended for majors, will cover principles and applications of prokaryotic and eukaryotic cell structure and function, biological molecules, homeostasis, cell reproduction and its controls, molecular genetics, classical/Mendelian genetics, cell metabolism including photosynthesis and respiration, and cellular communication. The philosophy of science, methods of scientific inquiry and experimental design are foundational to the course.

Prerequisites

Eligible for college-level math (C-ID MATH 110, 120, 130, 140, 150, 151 OR any other course with Intermediate Algebra as a prerequisite)

Corequisites

None

Advisories

Content

Structure and Function of Prokaryotic and Eukaryotic Cells
Origin and evolution of cellular life and molecular evolution
Organelle structure and function
Membrane structure and function
Cellular transport
Cellular chemistry and biomolecules
Cellular metabolism (respiration and photosynthesis)
Cell reproduction and its controls
Cell communication
Classical/Mendelian genetics
Molecular genetics
DNA structure and function
Gene structure, gene expression and control of gene expression
Biotechnology
Scientific Inquiry

Lab Activities

The laboratory component must include greater than 80% hands-on activities that support the learning goals of the course.
Laboratory content must be considered when matching courses to this descriptor.
Laboratory includes experimental design, data analysis, and techniques used to address questions in the field of cell and molecular biology (e.g. microscopy, spectrophotometry, gel electrophoresis).

Objectives

At the conclusion of this course, the student should be able to:

1. Identify and describe biological molecules and cell structures and explain their functions
2. Compare and contrast cellular processes and interactions between prokaryotes and eukaryotes (including metabolism, reproduction, communication)
3. Apply the principles of classical and molecular genetics to solve problems in genetics or biotechnology.

4. Relate evolutionary processes to the origin and evolution of cells.
5. Explain how DNA replicates and transmits genetic information within organisms.
6. Apply the processes of scientific inquiry and experimental design to the study of biological concepts.
7. Acquire, read, evaluate, apply and cite scientific literature
8. Practice scientific writing

Evaluation Methods

A variety of assessment techniques that may include midterm examinations, term papers, projects, homework problems, and laboratory reports. There should be a writing component.

Textbooks

A college level textbook and laboratory manual supporting the learning objectives of this course and current within 5 years must be considered when matching courses to this descriptor. Example texts with appropriate level of coverage include, Campbell, et al. Biology, Sadava et al. Life: The Science of Biology and Freeman, Biological Science.