

This course fulfills the following expectations for educational outcomes for biology majors

1. Core Competencies

- Be able to generate and to analyze data, to organize it for presentation, and to draw appropriate conclusions based on trends and/or supported by statistics, and to formulate new questions based on findings
- Be able to find and understand primary literature pertinent to a given topic in biological sciences, to examine and interpret data presented in figures and tables, and to evaluate conclusions based on the data presented
- Be able to understand techniques and methods described in current literature, or to investigate such methods through scholarly publications
- Be able to perform standard laboratory techniques accurately and safely
- Be able to access and utilize pertinent large databases
- Be able to report experimental results in a standard written format and to write coherently and persuasively about conclusions from such results and their significance
- Be able to communicate scientific results verbally, and to support their significance and relation to the current framework of understanding
- Understand how to pursue scientific inquiry through formulating hypotheses, designing controlled experiments or studies, gathering or generating data, and analyzing and evaluating results
- Be able to make connections between concepts in biology and the foundations of physical sciences and computational methods
- Be mindful of ethical considerations and societal outcomes in research and in technological advancement

2. Knowledge base

- An understanding of the major paradigms in biology, including evolution, cell theory, genetic inheritance, the central dogma, integration of living systems, and energy flow through ecosystems
- An understanding of the relationship between genotype and phenotype
- An understanding of the information flow between DNA, RNA, and proteins, and a basic knowledge of the processes that govern cellular function and division.
- Familiarity with the processes through which evolution occurs, and an understanding that selection acts on multiple stages in the life cycle
- An understanding of the dynamic nature of organismal development from inception through growth and differentiation, aging and death
- Appreciation of the morphological, physiological, ecological, and behavioral diversity of life, and the importance of that diversity
- Recognition that biological processes are based on chemical and physical principles, and that biology informs medicine, community health, food production, and environmental policy