

BIOCHEMISTRY AND MOLECULAR BIOLOGY, B.S. (BERKS)

Begin Campus: Any Penn State Campus

End Campus: Berks

Program Learning Objectives

- Students will be able to explain the following core concepts as recommended by the American Society for Biochemistry and Molecular Biology (ASBMB):
 - Energy:
 - Students will explain how energy is utilized and transformed in biological systems.
 - Students will explain their knowledge of basic chemical thermodynamics to biological systems.
 - Structure and Function:
 - Students will explain the importance of macromolecular structure in biological systems.
 - Students will be able to discuss the diversity and complexity of various biologically relevant macromolecules and macromolecular assemblies in terms of the basic repeating units of the polymer and the types of linkages between them.
 - Information Storage:
 - Students will define what a genome and explain how the information in the various genes and other sequence classes within each genome are used to store and express genetic information.
 - Students should be able to explain the central dogma of biology and relate the commonality of the process to all of life.
 - Students should be able to illustrate how DNA is replicated and genes are transmitted from one generation to the next in multiple types of organisms including bacteria, eukaryotes, viruses, and retroviruses.
- Students will demonstrate competence in the following skills related to experimental design:
 - Students will be able to develop a hypothesis, design and conduct appropriate experiments.
 - Students will analyze and interpret data using appropriate quantitative modeling and simulation tools.
 - Students will keep an accurate laboratory notebook.
- Students will demonstrate competency in the following skills related to information technology:
 - Students will be able to assess and use available information.
 - Find and use the primary literature.
 - Use databases and bioinformatics tools.
 - Students will be able to present scientific data in both written and oral formats.
 - Students will use visual and verbal tools to explain concepts and data.
 - Students will translate science into everyday examples.
- Students will be able to read, interpret and critically analyze primary literature.

- Students will be able to recognize and apply ethical principles to basic and applied practice and seek opportunities for interdisciplinary.
- Students will be able to work effectively as a member of a team.