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

Begin Campus: Any Penn State Campus

End Campus: University Park

Program Learning Objectives

- Students will communicate scientific information both orally and in written form to a variety of audiences, both expert and non-expert. In said communications, students will present data in a clear and informative manner using both verbal and visual representations such as graphs, figures and data tables.
- Students will integrate knowledge from areas such as mathematics, biological, chemical, and physical sciences to apply the fundamental principles of biochemistry and molecular biology to describe the processes that occur in living organisms. Examples of these fundamental principles include how energy is utilized to drive biological systems, how metabolic pathways are comprised of a series of interconnected reactions that result in synthesis or degradation of complex macromolecules, how macromolecular structure determines function and regulation, and how biological information is encoded, translated, transmitted, and maintained across generations.
- Students will explore careers related to the field of biochemistry and molecular biology and identify skills needed for success in those careers. Students will prepare for important professional roles in interdisciplinary settings (such as academic, health profession, government and industrial settings) by learning to collaborate effectively as a part of an inclusive and diverse workforce. Students will use analytical and critical thinking skills along with self-regulated learning strategies to reflect on one's own performance and to gain information needed to answer problems for which the solution is not initially evident.
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- Students will identify fundamental ethical issues important in the biological sciences and in research practices and engage in meaningful discourses on the impacts of biochemistry and molecular biology in the natural world and on the various applications that benefit society.
- Students will locate, interpret, and critically analyze scientific information found in primary literature as well as in databases. Students will generate testable hypotheses, design experiments, use core techniques in biochemistry and molecular biology to perform experiments, record results, and analyze experimental results in a critical manner using both quantitative and qualitative tools.