

# LEARNING OUTCOMES: BIOCHEMISTRY, BS

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Learning outcomes for the degree of Bachelor of Science Major in Biochemistry (Specialized Curriculum)

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Upon successful completion of the Biochemistry Specialized Curriculum, students will be able to:

1. Understand and appreciate that the diversity of life evolved over time by biomolecular processes of mutation, selection, genetic change, and epigenetics.
2. Explain that molecular and macromolecular structure as well as supramolecular architecture determine function and regulation.
3. Explain that information storage and flow are molecular-based, dynamic, and interactive.
4. Understand and appreciate that biochemical mechanisms and kinetics ensure relative cellular stability and function under external or internal changing condition.
5. Explain that energy is required by and transformed in biochemical systems as governed by the laws of thermodynamics.
6. Illustrate that living organisms and biological systems interact via molecular connections.
7. Design a scientific process and employ the scientific method, demonstrating that biochemistry is evidence-based and grounded in the formal practices of observation, objective measurement, and hypothesis testing.
8. Execute quantitative analysis and mathematical reasoning to interpret biochemical data.
9. Construct and utilize predictive models and simulations that define chemical relationships, as well as molecular interactions of complex systems.
10. Apply concepts from other sciences that span biology, chemistry, physics, mathematics, computation, and engineering to interpret biochemical phenomena.
11. Communicate biochemical concepts and understanding to members of a diverse scientific community, as well as to the general public.
12. Identify social and health-related dimensions of biochemical investigations.