

MAJOR IN BIOCHEMISTRY, ASBMB CONCENTRATION

The American Society for Biochemistry and Molecular Biology (ASBMB) concentration in Biochemistry is composed of a “core” set of courses comprised of 24 credits of primarily upper division coursework (22/24 credits are 400-level), along with a total of 9 “bioscience elective” credits selected from a list provided by the department. This option gives the student 13 “free elective” credits, which they can use to pursue a minor, a double major, and/or other academic interests. Thus, this concentration is designed to provide a broad background in biochemistry and can be tailored to meet the individual needs of specific students.

The ASBMB concentration is recommended for students considering teaching and/or research as a career. Students who graduate from this program can state on their resume that they graduated from an “ASBMB program.” If desired, students can take a 1-hour ASBMB exam during the spring semester of their senior year. Students who pass the exam will additionally receive degree certification from ASBMB. Accreditation (and certification) by ASBMB confirms that our undergraduate degree program meets very high standards, and thus will enhance the credentials of our graduating seniors.

Learning Objectives

Upon successful completion, students will be able to:

1. Explain how DNA is packaged, replicated, repaired, transcribed, and translated in both eukaryotes and prokaryotes.
2. Compare and contrast the regulatory mechanisms of transcription and translation in eukaryotes and prokaryotes.
3. Describe and discuss the molecular architecture of nucleic acids and proteins along with the non-covalent interactions responsibly for stabilizing the structure of these macromolecules.
4. Outline the salient features of the central pathways of glycolysis, gluconeogenesis, citric acid cycle, pentose phosphate pathway, fatty acid metabolism, ketogenesis, urea cycle, amino acid and nucleotide metabolism and explain the principles of electron transport, ATP synthesis, and their regulation.
5. Develop critical thinking skills for concepts related to cellular functions and their regulation mechanism.
6. Perform a wide-array of biochemical techniques and discuss how these tools are currently being used in biochemical research.
7. Communicate biochemical concepts to other scientists in written and oral form.
8. Make informed ethical judgments regarding research conduct and the practice of biochemistry.