

Biochemistry

Website: Biochemistry (<https://new.sewanee.edu/programs-of-study/biochemistry/>)

Students in the interdisciplinary field of biochemistry explore life's molecular building blocks and the intersections of biology and chemistry. Majors complete six required courses in Biology and Chemistry, then choose electives from such courses as cell biology, organic chemistry, thermodynamics and kinetics, genetics, immunology, microbiology, environmental physiology and biochemistry of animals, inorganic chemistry, chemical analysis, and advanced biochemistry.

Faculty

Professor: Kikis

Associate Professors: Seballos, C. Smith (Chair), R. Summers

Major

The interdisciplinary major in Biochemistry is administered by the Departments of Biology and Chemistry.

Requirements for the Major in Biochemistry

The major requires successful completion of the following:

Code	Title	Semester Hours
Course Requirements		
BIOL 133	Introductory Molecular Biology and Genetics ¹	4
BIOL 233	Molecular Cell Biology	4
BIOL 243	Molecular Methods (Lab)	4
BIOL 307	Mechanistic Biochemistry (Lab)	4
or CHEM 307	Mechanistic Biochemistry (Lab)	
Select one of the following:		4
BIOL 236	Biochemistry	
BIOL 316	Biochemistry of Metabolism and Molecular Biology (Lab)	
BIOL 317	Biochemistry of Metabolism and Molecular Biology	
CHEM 316	Biochemistry of Metabolism and Molecular Biology (Lab)	
CHEM 120	General Chemistry (Lab)	4
or CHEM 150	Advanced General Chemistry (Lab)	
CHEM 201	Organic Chemistry I (Lab)	4
CHEM 202	Organic Chemistry II (Lab)	4
CHEM 352	Thermodynamics and Kinetics (Lab)	4
MATH 102	Calculus II	4
PHYS 101	General Physics I (Lab)	4
Select at least two of the following: ²		8
BIOL 223	Genetics (Lab)	
or BIOL 224	Genetics	
BIOL 280	Molecular Genetics (Lab)	
BIOL 318	Molecular Revolutions in Medicine	
BIOL 319	Cancer Cell Biology (Lab)	
or BIOL 320	Cancer Cell Biology	
BIOL 325	Biology of Aging	
BIOL 331	Immunology	
BIOL 340	Microbiology (Lab)	
or BIOL 339	Microbiology	
BIOL 351	Environmental Physiology and Biochemistry of Animals	
BIOL 360	Virology	
BIOL 388	Epigenetics	

or BIOL 389	Epigenetics (Lab)
CHEM 308	Inorganic Chemistry (Lab)
CHEM 311	Instrumental Analysis (Lab)
CHEM 417	Advanced Biochemistry

Total Semester Hours **52**

Code	Title	Semester Hours
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Additional Requirements

A comprehensive examination ³

1

The Biochemistry Program will allow an AP test score of 5 or a higher level IB test score of 6 or 7 to substitute for BIOL 133. Students should be advised that mastery of the material covered in BIOL 133 will be important for their comprehensive exam.

2

Students who take BIOL 236 or BIOL 317 must select at least one laboratory course.

3

The comprehensive exam takes place during the second exam period of the Easter semester of a student's senior year. The exam consists of both written and oral portions covering core 200- and 300-level courses.

Honors

In order to receive honors in the Biochemistry program, a student must have a 3.20 or higher GPA in the major courses and must complete a research project that the Biochemistry committee considers worthy of honors. The research project may be done as part of an approved departmental research course, or it may be done in the context of a summer research program at the University of the South or at another institution. The honors project must involve some original work. A formal written report and seminar presentation on the research are required. Students must inform the Biochemistry committee of their intention to seek honors no later than October 1 of their senior year.

Student Learning Outcomes

A student majoring in Biochemistry will

1. Identify and clearly communicate foundational concepts of organic chemistry.
2. Identify and clearly communicate foundational concepts of cell biology.
3. Identify and clearly communicate foundational concepts of mechanistic and/or metabolic biochemistry.
4. Identify and clearly communicate foundational concepts of physical chemistry.
5. Apply the scientific method and core research techniques to interpret and analyze data and/or primary literature.
6. Apply foundational knowledge and/or verbal communication skills to hypothesize, predict, explain, and/or defend analysis of an applied problem.