

BIOCHEMISTRY (BS)

Contacts

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Campus: East Falls

Program Website (<https://www.jefferson.edu/academics/colleges-schools-institutes/life-sciences/degrees-programs/undergraduate-programs/biochemistry.html>)

Program Description

This active and collaborative program will prepare you for what's next. You start collecting chemical knowledge and skills through core courses and shadowing faculty and upper-level student researchers. As a sophomore, you will start helping with authentic, real-world research projects – experience many biochemistry students don't get until graduate programs. This is possible thanks to the individual attention you get in our small classes and our well-equipped research laboratories.

Learning Goals/Outcomes

- Describe laws & theories of chemistry pertaining to the properties of matter, chemical reactions and their stoichiometry, properties of gases, solution chemistry and acid/base chemistry.
- Describe chemistry of organic molecules including functional group structure and properties, structure and stereochemistry of alkanes, nucleophilic substitution and elimination reactions of alkyl halides, the structure/synthesis/reactions of alkenes, alcohols, aromatic compounds, amines, carboxylic acids, carboxylic acid derivatives and aldehydes/ketones.
- Summarize chemical thermodynamics, chemical kinetics & quantum mechanics and relate information to modern day chemistry.
- Develop language, terms & critical thinking/problem solving skills to use and understand analytical instrumentation used in chemistry and biochemistry today.
- Acquire laboratory skills, including knowledge of laboratory safety, proper laboratory behavior, and to be functional with laboratory equipment and techniques.
- Describe the chemistry of inorganic compounds, to include symmetry and group theory, molecular orbital theory, coordination chemistry, main group element chemistry and the chemistry of the solid state.
- Describe metabolism (including signaling mechanisms, basic biochemistry of DNA and RNA and mechanisms of control of gene expression), protein structure-function and laboratory techniques used in biochemical research.
- Garner information and critically analyze information (Information Literacy skills in general).
- Effectively communicate in written formats germane to the sciences.
- Successfully use their garnered research skills to probe new avenues of scientific inquiry.
- Utilize communication skills to disseminate research to both the general public and the scientific community.

Curriculum: 4 year, 125 credits

Course	Title	Credits
First Year		
FYS 100	Pathways Seminar	1
WRIT 101	Writing Sem I: Written Comm.	3
AVIS 101	American Visions	3
CHEM 113	Chemistry I	3
CHEM 113L	Chemistry I Lab	1
CHEM 114	Chemistry II	3
CHEM 114L	Chemistry II Lab	1
BIOL 103	Biology I	3
BIOL 103L	Biology I Lab	1
MATH 111	Calculus I	4
MATH 112	Calculus II	4
SCI 200	Intro to Sci Research Methods	1
Credits		28
Second Year		
WRIT 201	Writing Seminar II: Multi Comm	3
ETHC 2XX	Ethics Course Placeholder	3
GDIV 2XX	Global Diversity Placeholder	3
MATH 331	Math Methods in Chem, Phys & Eng	3
PHY 101	Physics I	3
PHY 103	Physics I Laboratory	1
PHY 102	Physics II	3
PHY 104	Physics II Laboratory	1
CHEM 201	Organic Chemistry I	3
CHEM 201L	Organic Chemistry I Lab	1
CHEM 202	Organic Chemistry II	3
CHEM 202L	Organic Chemistry II Lab	1
General Elective		3
Credits		31
Third Year		
ADIV 2XX	American Diversity Placeholder	3
GCIT 2XX	Global Citizenship Placeholder	3
CGIS 300	Contemporary Global Issues	3
ISEM 3XX	Integrative Sem Placeholder	3
BCHM 312	Biochemistry: Proteins	3
BCHM 312L	Biochemistry: Proteins Lab	1
BCHM 313	Biochemistry: Metabolism	3
BCHM 313L	Biochemistry: Metabolism Lab	1
CHEM 305	Physical Chemistry I	3
CHEM 305L	Physical Chemistry I Lab	1
CHEM 306	Physical Chemistry II	3
CHEM 306L	Physical Chemistry II Lab	1
Adv Chemistry Elective		3-4
Credits		31-32
Fourth Year		
PHIL 499	Philosophies of the Good Life	3
CHEM 323	Instrumental Meth of Analysis	3
CHEM 323L	Instrmntl Meth of Analysis Lab	1
CHEM 309	Inorganic Chemistry	3
CHEM 309L	Inorganic Chemistry Lab	1
Adv Chemistry Electives		9-11
General Elective		9
Credits		29-31
Total Credits		119-122