

BIOCHEMISTRY MAJOR

The biochemistry program draws on faculty expertise from the departments of Chemistry Biochemistry and Biological Sciences, in areas including physical and analytical biochemistry, enzymology, cell biology, microbiology, immunology, and genetics. Students begin with a sound preparation in basic biology and chemistry during the first two years, supported by physics and mathematics. The third and fourth years involve, besides biochemistry itself, physical and analytical chemistry, molecular and cell biology, and genetics, as well as electives chosen by the student from an approved list of biology and chemistry courses to meet his/her particular interests. Students also have ample opportunities to pursue undergraduate research in biochemistry. Undergraduate study in biochemistry at the University provides a solid background for advanced training in genetics, molecular biology, physiology, cell biology and immunology, besides graduate study in biochemistry as well as an excellent preparation for medicine or any of the other health professions. Students in the biochemistry program also learn the experimental techniques that prepare them for technical positions in biomedical research in one of the growing number of industries involved in biotechnology. From cancer research to gene splicing to photosynthetic capture of solar energy, biochemistry leads the way with new ideas.

Learning Goals and Outcomes

1. Fundamental Knowledge and Understanding:

Students will demonstrate a good understanding of the basic concepts pertaining to all the major sub-disciplines of chemistry (analytical, biochemistry, inorganic, organic and physical).

2. Fundamental Skills:

Students will demonstrate their understanding of basic experimental techniques, knowledge of instrumentation and safety issues in the laboratory in all areas of chemistry.

3. Problem-Solving, Critical Thinking, and Application of Knowledge:

Students will develop critical thinking skills and apply their knowledge to solve problems

4. Scientific Communication Skills:

Students will be able to analyze and communicate scientific information effectively both in oral and written formats.

5. Scientific Information Literacy Skills:

Students will be able to learn independently, to explore the scientific literature using a variety of resources, and communicate that information.

Requirements

The traditional undergraduate programs includes a minimum of 120 credits distributed across three components: A General Education component divided into Signature Courses, Variable Courses, and an Integrative Learning requirement; a Major and Divisional component; and Free Electives. In addition to course requirements as specified in each area, students must complete one certified course in each of the following overlay areas¹:

1. Diversity, Globalization or Non-western Area Studies,
2. Ethics Intensive

3. Writing Intensive, and
4. Diversity

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Overlay requirements are part of the 120 credit requirements

General Education Signature Courses

See this page about Signature courses (<https://academiccatalog.sju.edu/curricula/#signature>).

General Education Variable Courses

See this page about Variable courses (<https://academiccatalog.sju.edu/curricula/#variable>). Six to Nine courses

General Education Overlays

See this page about Overlays (<https://academiccatalog.sju.edu/curricula/#overlay>).

General Education Integrative Learning Component

See this page about Integrative Learning Component (<https://academiccatalog.sju.edu/curricula/#integrative-learning>). Three courses:

Code	Title	Hours
BIO 101 & 101L	Bio I: Cells and Bio I: Cells Lab	4
PHY 105 & 105L	University Physics I and University Physics Lab I	4
PHY 106 & 106L	University Physics II and University Physics Lab II	4

Major Requirements:

Code	Title	Hours
BIO 102 & 102L	Bio II: Genetics and Bio II: Genetics Lab	4
CHM 118	Chemical Sciences Orientation	1
CHM 125 & 125L	General Chemistry II and General Chemistry Lab II	4
CHM 204	Literature of Chemistry	1
CHM 210 & 210L	Organic Chemistry I and Organic Chemistry Lab I	4
CHM 215 & 215L	Organic Chemistry II and Organic Chemistry Lab II	4
CHM 300	Discussions in Chemistry	1
CHM 320	Physical Chem for Chem Bio	3
CHM 341	Molecular Structure Biochemist	3
CHM 342	Nucleic Acid Biochemistry	3
CHM 343	Intermediary Metabolic Biochem	3
CHM 350	Inorganic Chemistry	3
CHM 361 & 361L	Analytical Chemistry and Analytical Chemistry Laborator	4
CHM 390	Chemistry Seminar (senior year)	0
CHM 402	Seminar in Chemistry II	1
CHM 444L	Biochemistry Laboratory I	1
CHM 445L	Biochemistry Laboratory II	1

2 Biochemistry Major

MAT 128	Applied Statistics	3-4
or MAT 162	Calculus II	
Biochemistry Elective		6