BIOCHEMISTRY, B.S.

Saint Louis University's Bachelor of Science in biochemistry is designed for students interested in the applications of chemistry to the life sciences. The program prepares students for professional schools such as medicine, dentistry, law and pharmacy. The program provides excellent preparation for students interested in working in biochemistry, molecular biology or biotechnology.

The chemistry department at Saint Louis University places great emphasis on participation in undergraduate research, and majors have ample opportunities to involve themselves in research projects under the close mentorship of a full-time faculty member. Students have the opportunity to use a variety of specialized equipment and computers in their instructional and research laboratories.

The department hosts several social events each year and sponsors a chemistry club for interested students.

Other highlights include:

- A rigorous program that makes graduates competitive for employment in STEM areas.
- Opportunities for students to strengthen their scientific communication skills through research activities that pair an undergraduate with a faculty researcher.
- A unique mentoring program that continues from freshman to senior year, providing guidance and support for students in reaching their professional goals.

Curriculum Overview

- **First year:** General Chemistry 1 and 2, Calculus I and II, Principles of Biology I and II
- **Second year:** Organic Chemistry 1 and 2, Analytical Chemistry 1, Engineering Physics I and II
- **Third year:** Biochemistry 1 and 2, Chemistry Literature, Inorganic Chemistry, Physical Chemistry 1 and 2, Physical Chemistry Lab, undergraduate research
- **Fourth year:** Principles of Genetics, undergraduate research, one chemistry elective

Fieldwork and Research Opportunities

Selected undergraduate students may have opportunities to work with faculty members as laboratory assistants in undergraduate laboratories and receive a stipend.

Benefits of SLU’s biochemistry program also include many internship and career opportunities. Undergraduates who study chemistry at SLU can attend professional meetings and present their research results. In recent years, SLU students have presented numerous talks and poster presentations at regional and national meetings of the American Chemical Society and other scientific conferences.

Careers

Career options in biochemistry include:

- Teaching at the university, college or high school level
- Chemical research and development in industry or government laboratories
- Pharmaceutical research
- Drug discovery and drug development
- Biotechnology
- Environmental research
- Management and administration in the chemical industry
- Chemical and pharmaceutical sales
- Patent law and environmental law
- Opportunities in the public health sector

A Bachelor of Science degree in biochemistry is good preparation for students who want to continue their education in graduate school studying chemistry, biochemistry and health-related areas such as pharmacology and toxicology, as well as in professional school studying medicine, law, pharmacy or dentistry.

Admission Requirements

**Freshman**

Begin your application for this program at [www.slu.edu/apply](http://www.slu.edu/apply). Saint Louis University also accepts the Common App.

All applications are thoroughly reviewed with the highest degree of individual care and consideration to all credentials that are submitted. Solid academic performance in college preparatory course work is a primary concern in reviewing a freshman applicant's file.

To be considered for admission to any Saint Louis University undergraduate program, the applicant must be graduating from an accredited high school, have an acceptable HiSET exam score or take the General Education Development (GED) test. Beginning with the 2021-22 academic year, undergraduate applicants will not be required to submit standardized test scores (ACT or SAT) in order to be considered for admission. Applicants will be evaluated equally, with or without submitted test scores.

Begin Your Application ([www.slu.edu/apply](http://www.slu.edu/apply))

**Transfer**

Begin your application for this program at [www.slu.edu/apply](http://www.slu.edu/apply).

Applicants must be a graduate of an accredited high school or have an acceptable score on the GED. An official high school transcript and official test scores are required only of those students who have attempted fewer than 24 transferable semester credits (or 30 quarter credits) of college credit. Those having completed 24 or more of college credit need only submit a transcript from previously attended college(s). In reviewing a transfer applicant’s file, the office of admission holistically examines the student's academic performance in college-level coursework as an indicator of the student's ability to meet the academic rigors of Saint Louis University.

**International Applicants**

Begin your application for this program at [www.slu.edu/apply](http://www.slu.edu/apply).

All admission policies and requirements for domestic students apply to international students along with the following:

- Demonstrate English Language Proficiency ([http://catalog.slu.edu/academic-policies/office-admission/undergraduate/english-language-proficiency/](http://catalog.slu.edu/academic-policies/office-admission/undergraduate/english-language-proficiency/))
• Proof of financial support must include:
  • A letter of financial support from the person(s) or sponsoring agency funding the time at Saint Louis University
  • A letter from the sponsor's bank verifying that the funds are available and will be so for the duration of study at the University
  • Academic records, in English translation, of students who have undertaken postsecondary studies outside the United States must include the courses taken and/or lectures attended, practical laboratory work, the maximum and minimum grades attainable, the grades earned or the results of all end-of-term examinations, and any honors or degrees received. WES and ECE transcripts are accepted.

Scholarships and Financial Aid
There are two principal ways to help finance a Saint Louis University education:

• Scholarships: Awarded based on academic achievement, service, leadership and financial need.
• Financial Aid: Provided in the form of grants and loans, some of which require repayment.

For priority consideration for merit-based scholarships, apply for admission by Dec. 1 and complete a Free Application for Federal Student Aid (FAFSA) by March 1.

For information on other scholarships and financial aid, visit the student financial services office online at https://www.slu.edu/financial-aid/.

Accreditation
The Bachelor of Science in Biochemistry has been continuously certified by the American Chemical Society since 2004.

Learning Outcomes
1. Graduates will be able to demonstrate a foundational understanding of organic, inorganic, analytical and physical chemistry, and advanced knowledge in biochemistry.
2. Graduates will be able to demonstrate proficiency of basic (general, organic, analytical and physical) and advanced biochemistry laboratory techniques and conduct laboratory experiments safely.
3. Graduates will be able to collect, interpret and analyze quantitative data.
4. Graduates will be able to communicate scientific results effectively, especially through written reports and oral presentations.
5. Graduates will be able to design and conduct independent research.

Requirements
Biochemistry students must complete a minimum total of 72 credits for the B.S. major.

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<td>General Biology: Information Flow and Evolution</td>
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<td>Principles of Genetics</td>
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Requirements for Graduates
Graduates will be able to:
1. Design and conduct independent research.
2. Communicate scientific results effectively, especially through written reports and oral presentations.
3. Collect, interpret and analyze quantitative data.
4. Use quantitative data to make inferences.
5. Demonstrate foundational knowledge in biochemistry.

Non-Course Requirements
All undergraduate majors must complete an exit interview with the department chair during their final semester.

Continuation Standards
The following standards apply to all new freshmen and transfer students:

• Students must earn C- or better in CHEM 1110 General Chemistry 1 or CHEM 1130 General Chemistry 1 for Majors and a C- or better
in CHEM 1120 General Chemistry 2 or CHEM 1140 General Chemistry 2 for Majors, or the equivalent in transfer.

- Students must earn a C- or better in CHEM 2200 Analytical Chemistry 1.

Students who do not earn a C- in any of the identified courses must retake the course at SLU in the following semester. If a C- is not earned on the second attempt the student will be dismissed from the major. A student who withdraws from one of these courses on the first attempt thus has one more attempt to earn a C-.

Students must maintain a 2.00 GPA in their major (CHEM) and required related courses (BIOL, PHYS, MATH, etc.) If a student falls below a 2.00 major GPA the student must meet with the undergraduate program director to review their academic performance. If the student cannot raise the major GPA to 2.00 in two semesters, the student will be dismissed from the major.

Students must earn a C- or better in:

- CHEM 1120 General Chemistry 2
- CHEM 1130 Calculus I
- CHEM 1140 General Chemistry 1 for Majors
- CHEM 1145 General Chemistry 1 Laboratory
- MATH 1510 Calculus I
- MATH 1520 Calculus II
- BIOL 1240 General Biology: Information Flow and Evolution
- BIOL 1245 Principles of Biology I Laboratory
- A&S Core

- Achieve at least a 2.00 cumulative grade point average, a 2.00 grade point average in the major(s) and a 2.00 grade point average in the minor/certificate, or related elective credits.

- Complete department/program-specific academic and performance requirements.

- Complete at least 50% of the coursework for the major and 75% for the minor/certificate through Saint Louis University or an approved study abroad program.

- Complete 30 of the final 36 credits through Saint Louis University or an approved study abroad program.

- Complete an online degree application by the required University deadline.

### Roadmap

Roadmaps are recommended semester-by-semester plans of study for programs and assume full-time enrollment unless otherwise noted.

Courses and milestones designated as critical (marked with !) must be completed in the semester listed to ensure a timely graduation. Transfer credit may change the roadmap.

This roadmap should not be used in the place of regular academic advising appointments. All students are encouraged to meet with their advisor/mentor each semester. Requirements, course availability and sequencing are subject to change.

#### Year One

**Fall**

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#### Total Credits 54-63

#### Year Two

**Fall**

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**Credits** 15

- Complete 30 of the final 36 credits through Saint Louis University or an approved study abroad program.

- Complete an online degree application by the required University deadline.
Spring
CHEM 2440 Organic Chemistry 2 for Majors 3
CHEM 2445 Organic Chemistry 2 Laboratory for Majors 1
PHYS 1630 Engineering Physics II 3
PHYS 1640 Engineering Physics II Laboratory 1
A&S Core 3
A&S Core 3
A&S Core 3
Credits 17

Year Three
Fall
CHEM 4610 Biochemistry 1 3
CHEM 4615 Biochemistry 1 Laboratory 1
CHEM 3330 Physical Chemistry 1 3
CHEM 3100 The Chemical Literature 1
A&S Core 3
A&S Core 3
A&S Core 3
Credits 17

Spring
CHEM 4620 Biochemistry 2 3
CHEM 4625 Biochemistry 2 Laboratory 1
CHEM 3340 Physical Chemistry 2 3
CHEM 3345 Physical Chemistry Laboratory 1
CHEM 3970 Undergraduate Research 1
A&S Core 3
A&S Core 3
Credits 15

Year Four
Fall
CHEM 3970 Undergraduate Research 1
BIOL 3030 Principles of Genetics 3
CHEM 4500 Inorganic Chemistry 3
A&S Core 3
A&S Core 3
Credits 13

Spring
Completion of Exit Interview
Completion of Undergraduate Thesis
CHEM 4XXX Elective 3
CHEM 3970 Undergraduate Research 1
A&S Core 3
Elective 3
Elective 3
Credits 13
Total Credits 120

Program Notes
Engineering Physics (PHYS 1610 Engineering Physics I (3 cr)-PHYS 1640 Engineering Physics II Laboratory (1 cr)) is recommended. However, Physics (PHYS 1310 Physics I (3 cr)-PHYS 1340 Physics II Laboratory (1 cr)) also fulfills the physics requirement.