CHEMISTRY, PH.D.

Saint Louis University's chemistry Ph.D. program offers specializations, including traditional areas of analytical, physical, organic and inorganic chemistry, as well as cross-disciplinary areas of materials and biological chemistry. Students must complete intensive research culminating in a dissertation.

Program Highlights

The SLU chemistry program offers students:

- Close mentoring relationships
- Small research-group size
- Opportunities to participate in interdisciplinary research

Graduate students in SLU's Department of Chemistry (https://www.slu.edu/science-and-engineering/academics/chemistry/) have access to a number of research tools, including:

- Bruker 400 and 700 MHz NMR spectrometers
- Bruker-EMX EPR, UV-Vis and FTIR spectrometers
- Research-grade spectrofluorometers
- GC-MS and LC-MS
- Electrochemical analyzers
- Gas chromatographs
- A scanning electron micrograph
- Computational facilities with modern molecular software
- A Bruker CCD X-ray diffractometer facility

Curriculum Overview

SLU's Ph.D. in chemistry requires a minimum of 35 post-baccalaureate credits, with at least 23 credits of coursework and 12 credits of dissertation research.

Graduate Handbook (https://www.slu.edu/science-and-engineering/academics/chemistry/student-resources/graduate-resources.php)

Research Opportunities

Our graduate students are active in the research areas of analytical, organic, physical, synthetic, materials, environmental and biological chemistry. Our research groups regularly publish in top-ranked journals and present at national and international conferences.

Research is externally supported by the National Institutes of Health, National Science Foundation, NASA, Petroleum Research Fund and American Heart Association, among others.

Careers

Past students from SLU's chemistry Ph.D. program have gone on to careers as research scientists, teachers, university faculty and in various capacities in pharmaceutical companies and government agencies.

Admission Requirements

Applicants should possess sufficient GPA and TOEFL (if applicable) scores and a bachelor's degree from an accredited college or university. Bachelor's degrees usually are in chemistry or biochemistry, although other science majors will be considered.

Admission typically requires a minimum of 18 semester credits (minimum 2.8 GPA) of upper-division undergraduate chemistry courses, including organic chemistry (two semesters), quantitative analysis (one semester) and physical chemistry (two semesters). Students who do not meet these criteria may complete these prerequisites as part of their graduate program, though not for graduate credit.

Students who have not completed equivalent coursework in upper-level undergraduate inorganic chemistry and instrumental analysis will also be required to complete these courses, but they can be taken for departmental graduate credit.

Application Requirements

- Application form
- Two letters of recommendation (three preferred)
- Résumé
- Goal statement
- Interview (desired)

Requirements for International Students

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

- Demonstrate English Language Proficiency (https://catalog.slu.edu/academic-policies/office-admission/graduate/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.

Application Deadlines

Applications will be reviewed on a rolling basis with priority review given to applications received by Dec. 15 for the fall semester and by Sept. 1 for the spring semester.

Review Process

The Chemistry Graduate Committee votes on whether to admit, deny or waitlist applicants. Applicants on the waitlist may be offered admission in a future semester.

Tuition

Tuition	Cost Per Credit
Graduate Tuition	$1,450

Additional charges may apply. Other resources are listed below:

Information on Tuition and Fees (https://catalog.slu.edu/academic-policies/student-financial-services/tuition/)

Miscellaneous Fees (https://catalog.slu.edu/academic-policies/student-financial-services/fees/)

Information on Summer Tuition (https://catalog.slu.edu/academic-policies/student-financial-services/tuition-summer-current/)

Scholarships, Assistantships and Financial Aid

For priority consideration for a graduate assistantship, apply by the program admission deadlines listed. Fellowships and assistantships provide a stipend and may include health insurance and a tuition scholarship for the duration of the award.

Explore Scholarships and Financial Aid Options (https://www.slu.edu/financial-aid/types-of-aid/)

Learning Outcomes

Graduates will be able to:

1. **Demonstrate advanced knowledge in chemistry.** Exhibit deep and comprehensive understanding in the core areas of chemistry, with particular expertise in the student's chosen area of research
2. **Demonstrate advanced information literacy.** Efficiently locate, evaluate, and integrate scientific literature to inform research questions and methodology.
3. **Conduct independent, original research.** Design, execute, and interpret advanced chemical research, culminating in a dissertation and peer-reviewed publication(s) that contribute new knowledge to the field.
4. **Communicate scientific findings effectively.** Present research findings clearly and effectively in both written and oral formats to diverse audiences, including scientific peers and broader communities.
5. **Apply ethical and professional standards.** Practice responsible conduct of research and uphold the highest standards of ethics and professionalism in all aspects of scientific work.

Requirements

Code	Title	Credits
Graduate Chemistry Courses		**12**
Select four of the following:		
CHEM 5200	Analytical Chemistry II	
CHEM 5410	Organic Chemistry 3	
CHEM 5930	Special Topics	
CHEM 5230	Mass Spectrometry	
CHEM 5260	Analytical Separations	
CHEM 5270	Electroanalytical Chemistry	
CHEM 5300	Mathematical Techniques in Chemistry	
CHEM 5370	Computational Chemistry	
CHEM 5390	Special Topics: Physical Chemistry	
CHEM 5400	Organic Spectroscopy	
CHEM 5440	Bioorganic Chemistry	
CHEM 5450	Advanced Organic Chemistry	
CHEM 5460	Synthetic Organic Chemistry	
CHEM 5470	Medicinal Chemistry	
CHEM 5500	Inorganic Chemistry	
CHEM 5550	Organometallic Chemistry	
CHEM 5560	Solid State Chemistry	
CHEM 5570	Group Theory & Spectroscopy	
CHEM 5610	Biochemistry 1	
CHEM 5615	Biochemistry 2	
CHEM 5620	Biophysical Chemistry	
CHEM 5630	Introduction to Chemical Biology and Biotechnology	
CHEM 5800	Fundamentals and Design of Nanomaterials	
Required Research Courses		
CHEM 5000	Introduction to Chemical Research	1
CHEM 6900	Introduction to Proposal Writing and Oral Presentations	1
CHEM 6990	Dissertation Research (taken over multiple semesters, 12hrs total)	0-6
Research Elective		**3**
Select one of the following:		
CHEM 5299	Introduction to Analytical Research	
CHEM 5399	Introduction to Physical Research	
CHEM 5499	Introduction to Organic Research	
CHEM 5599	Introduction to Inorganic Research	
Chemistry Electives		**6**
Select two additional graduate chemistry courses from those listed above OR electives can also be fulfilled by taking 5000-level courses in other disciplines such as biology, math, computer science, engineering, and pharmacology with approval by Graduate Program Coordinator and student's committee.		
Total Credits		**35**

Non-Course Requirements

- Completion of research progress exam
- Completion of written comprehensive exam
- Completion of oral defense of research proposal
- A public oral presentation and a private oral examination

Continuation Standards

Students must maintain a cumulative grade point average (GPA) of 3.00 in all graduate/professional courses. Grades of C and below are not considered passing and require repeating or replacement with another grad level course, achieving a grade of B- or better.

Roadmap

This roadmap is just one example of a semester-by-semester plan of study for this program. There are other plans students can and do take. The plan of study for each particular student is established in consultation with each student's academic advisor; *this roadmap does not replace academic advising appointments.*

Roadmap notes:

- This Roadmap assumes full-time enrollment unless otherwise noted.
- Courses/Milestones marked with an "!" are critical and must be completed in the semester listed in the Roadmap to ensure a timely graduation.
- Course availability and sequencing are subject to change.

Course	Title	Credits
Year One		
Fall		
CHEM 5000	Introduction to Chemical Research	1
Graduate Chemistry course		3
Graduate Chemistry course		3
	Credits	**7**
Spring		
Graduate Chemistry course		3
Graduate Chemistry course		3
	Credits	**6**
Summer		
CHEM 5299 or CHEM 5399 or CHEM 5499 or CHEM 5599	Introduction to Analytical Research or Introduction to Physical Research or Introduction to Organic Research or Introduction to Inorganic Research	3
	Credits	**3**
Year Two		
Fall		
Chemistry elective		3
	Credits	**3**
Spring		
Completion of Research Progress Exam		
Chemistry elective		3
	Credits	**3**
Summer		
CHEM 6990	Dissertation Research †	3
	Credits	**3**
Year Three		
Fall		
Completion of Written Comprehensive Exam		
CHEM 6900	Introduction to Proposal Writing and Oral Presentations	1
CHEM 6990	Dissertation Research †	1
	Credits	**2**
Spring		
CHEM 6990	Dissertation Research †	2
	Credits	**2**
Summer		
CHEM 6990	Dissertation Research †	1
	Credits	**1**
Year Four		
Fall		
CHEM 6990	Dissertation Research †	1
	Credits	**1**
Spring		
CHEM 6990	Dissertation Research †	1
	Credits	**1**
Summer		
CHEM 6990	Dissertation Research †	1
	Credits	**1**
Year Five		
Fall		
CHEM 6990	Dissertation Research †	1
	Credits	**1**
Spring		
CHEM 6990	Dissertation Research †	1
	Credits	**1**
	Total Credits	**35**

† Students are required to complete a minimum of 12 credits of dissertation research. The number of credits can vary each semester, but a student cannot register for zero credits of research until the 12 credits have been completed.

Contact Us

For more information, email the chemistry graduate program coordinator at chemgrad@slu.edu.

For more information about any School of Science and Engineering graduate program, email ssegrad-admissions@slu.edu.