CHEMICAL BIOLOGY, M.S.

A Master of Science in Chemical Biology from Saint Louis University provides advanced instruction and training in synthetic organic chemistry, biology and pharmacology. The core of this SLU degree includes organic and medicinal chemistry, molecular biology and pharmacology and can be tailored to match a student's interests in chemical biology.

Program Highlights

Saint Louis University's master's degree in chemical biology provides excellent preparation for studies toward a Ph.D. or transitioning to a career in the life sciences industry. Employment opportunities include a variety of jobs in the pharmaceutical, biotechnology and materials industries.

Graduate students in SLU's chemical biology program 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, LC-MS, and specialized mass spectrometers
- Computational facilities with modern molecular modeling software
- Bruker CCD X-ray diffractometer facility
- Core facilities in the School of Medicine (https://www.slu.edu/medicine/) (e.g., protein, microscopy, etc.)

Curriculum Overview

SLU's Master of Science in Chemical Biology offers specialization in medicinal chemistry, molecular biology and pharmacology, with cross-disciplinary activity strongly encouraged.

The requirements for the thesis-based M.S. degree include:

- A minimum of 24 credits of post-baccalaureate coursework (exclusive of thesis research)
- Six credits of thesis research (CHEB 5990)
- A thesis
- A public oral presentation and a private oral examination

Required coursework includes medicinal chemistry, molecular biology and pharmacology taught by faculty from the corresponding departments. Electives are chosen to complement a student's interests and the research program that they join.

Many graduate courses in chemistry are scheduled in the evening, allowing students to complete the degree part time. This flexibility allows students to tailor a program of study to suit their needs.

For students who hold a bachelor's degree and are interested in completing the doctoral program in chemistry, there is a mechanism to transition into the Ph.D. program after completing the master's requirements. A total of 39 credits are required, including 12 dissertation research credits. Students will develop an appropriate coursework track with mentors who will be approved by the graduate program director and/or the department chair.

Fieldwork and Research Opportunities

Graduate students are active in the research areas of medicinal chemistry, biochemistry, molecular biology, cell biology and pharmacology. Research groups regularly publish in top-ranked journals and present at national and international conferences.

Careers

Chemical biology graduates are employed in a diverse array of fields such as pharmaceuticals, biotechnology, patent law, biomedical engineering and academic research.

Admission Requirements

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

Admission normally requires undergraduate coursework including (minimum credits in parentheses):

- Calculus (4)
- Organic chemistry with labs (8)
- Physics with labs (8)
- Physical chemistry (3)
- Biochemistry (3)
- Biology (6)

Students who do not meet these criteria may complete these prerequisites as part of their graduate program, though not for graduate credit.

Application Requirements

- Application form
- Official transcripts
- Three letters of recommendation
- Résumé
- Goal statement
- Interview (desired)

Requirements for International Students

All Saint Louis University admission policies and requirements for domestic students apply to international students. International students applying to SLU must also meet the following additional requirements:

- Demonstrate English language proficiency (https://catalog.slu.edu/academic-policies/office-admission/undergraduate/english-language-proficiency/)
- Academic records must include an English translation. Unofficial copies may be accepted in some cases for initial admission review, however official copies must be received prior to enrollment. Course-by-course transcript evaluations are accepted.

Students must submit financial documents to be issued an I-20 for their F-1 visa application. Proof of financial support must include:

- A letter of financial support from the person(s) or sponsoring agency funding the student's 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 the student's study at the University

Application Deadlines

Students who want to be considered for the summer and fall semesters must submit their applications by Jan. 15.

Review Process

A three-person committee votes on whether to accept applicants.

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

1. Graduates will be able to assess relevant literature in chemical biology.
2. Graduates will be able to apply the major practices, theories or research methodologies in chemical biology.
3. Graduates will be able to apply chemistry principles to biology.
4. Graduates will be able to articulate arguments or explanations in both oral and written forms.
5. Graduates will be able to evidence scholarly and professional integrity in chemical biology.

Requirements

Code	Title	Credits
Required Courses		
CHEM 5630	Introduction to Chemical Biology and Biotechnology	3
CHEM 5470	Medicinal Chemistry	3
PPY 5410	Molecular Pharmacology †	3
or PPY 5110 & PPY 5120	Introduction to Pharmacology and Systems Physiology and Pharmacology I	
Required Research Courses		
CHEB 5110	Introduction to Chemical Biology Research I	1
CHEB 5120	Introduction to Chemical Biology Research II	2
CHEB 5970	Research Topics	3
CHEB 5990	Thesis Research	6
Electives		
Select 9 credits in 5000 level courses in Chemistry, Biology, or Pharmacology ‡		*9*
Total Credits		**30**

Non-Course Requirements

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.

† PPY 5110 Introduction to Pharmacology (1 cr) and PPY 5120 Systems Physiology and Pharmacology I (2 cr) may be taken in place of PPY 5410 Molecular Pharmacology (3 cr).

‡ Selected from 5000-level courses in consultation with student's research mentor. Electives should be selected from chemistry, biology, pharmacology or biochemistry departments. Electives can also be fulfilled by taking 5000-level courses in other disciplines with approval by a program coordinator and the student's committee.

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 5630	Introduction to Chemical Biology and Biotechnology (Only offered Fall of even years. Evening course.)	3
CHEM 5000	Introduction to Chemical Research	1
Elective [2]		3
	Credits	**7**
Spring		
PPY 5410	Molecular Pharmacology (! Offered every Spring.) [1]	3
CHEM 5470	Medicinal Chemistry (! Offered every Spring. Evening course)	3
CHEB 5120	Introduction to Chemical Biology Research II	2
	Credits	**8**

Year Two		
Fall		
CHEB 5990	Thesis Research [3, 4]	3
Form thesis committee and submit written research progress report by November 1st.		
Elective [2]		3
	Credits	**6**
Spring		
CHEB 5990	Thesis Research [3, 4]	3
! Elective [2]		3
Submit written thesis and give oral thesis defense		
	Credits	**6**
Summer		
CHEB 5970	Research Topics	3
	Credits	**3**
	Total Credits	**30**

1 The PPY 5110 and PPY 5120 sequence may be taken in place of PPY 5410. PPY 511- and 5120 are fall semester courses.

2 **Electives (must take at least two courses):** Electives can be fulfilled by taking 5000-level courses in chemistry, pharmacology or biology. Electives in other disciplines such as math, computer science, and engineering may be taken with approval by a program coordinator and the student's committee.

3 **CHEB 5990 Thesis Research:** Students are required to complete six credits of thesis research. This requirement is typically completed in the second year. The number of credits can vary each semester, but a student cannot register for zero credits of research until the six credits have been completed.

4 Students intending to enter into a SLU Ph.D. program under the M.A. – chemical biology program follow the M.S. roadmap but do not register for CHEB 5990.

Contact Us

For additional information about our program, please contact:

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