MATHEMATICS, PH.D.

The Department of Mathematics and Statistics at Saint Louis University offers graduate programs of advanced study and research leading to Master of Arts and Doctor of Philosophy degrees in mathematics. Due to the low student-faculty ratio, graduate students receive extensive individualized instruction.

Curriculum Overview

All mathematics Ph.D. students at SLU must complete high-level courses in algebra, analysis, topology and differential geometry. As a Ph.D. candidate, you also must pass written exams in three major fields of mathematics, plus a language exam that tests your ability to read mathematical works in French, German or Russian. The capstone is to write and defend a dissertation presenting the results of your research.

Fieldwork and Research Opportunities

Courses at the advanced graduate level allow students to proceed beyond the standard graduate curriculum into areas of research represented by the faculty. To graduate, students must write and successfully defend a dissertation that presents the results of the original and independent mathematical research that they have carried out, with the guidance of a faculty member.

Careers

The Ph.D. in Mathematics prepares students for research or teaching careers in colleges, universities or industry.

Admission Requirements

Applicants should have a master's degree or a bachelor's degree in mathematics that includes a year of coursework in algebra and in analysis or topology.

Application Requirements

- Application form and fee
- Transcript(s)
- Three letters of recommendation
- Résumé
- Professional goal statement

Requirements for International Students

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/)
- 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.

Assistantship and Application Deadlines

Students who want to be considered for an assistantship must submit their application by Jan. 1.

U.S. students who want to be considered for the fall semester should apply by July 1 and for the spring semester by Nov. 1.

International students should apply for the fall semester by May 1 and for the spring semester by Oct. 1.

Review Process

All applications are reviewed by committee with about a six-week wait for decision-notification to applicants. All applicants have until April 15 to decide to accept.

Scholarships, Assistantships and Financial Aid

For priority consideration for a graduate assistantship, applicants should complete their applications 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.

For more information, visit the student financial services office online at http://www.slu.edu/financial-aid (http://www.slu.edu/financial-aid/).

Learning Outcomes

1. Graduates will be able to demonstrate fundamental knowledge in the areas of algebra, analysis, topology, and differential geometry.
2. Graduates will be able to demonstrate mastery in three of the above four areas.
3. Graduates will be able to demonstrate ability to identify and solve new research problems in pure or applied mathematics.
4. Graduates will be able to demonstrate ability to effectively communicate new research in both a written and oral setting.
5. Graduates will be able to demonstrate ability to manage a large research project and prepare a manuscript.

Requirements

Code	Title	Credits
Required Courses		
Algebra Sequence		
MATH 5110	Algebra I	3
MATH 5120	Algebra II	3
Analysis Sequence		
MATH 5210	Real Analysis	3
Select one of the following:		3
MATH 5220	Complex Analysis	
MATH 5230	Functional Analysis	
MATH 5240	Harmonic Analysis	
Topology Sequence		
MATH 5310	General Topology I	3
MATH 5320	General Topology II	3
Differential Geometry Sequence		
MATH 6410	Differential Geometry I	3

MATH 6420	Differential Geometry II	3
Dissertation Research		
MATH 6990	Dissertation Research (taken over multiple semesters)	12
Elective Courses		
Six additional MATH courses at the 5000-level or above.		18
Total Credits		54

Non-Course Requirements

Written preliminary exams in three out of the four possible areas of algebra, analysis, differential geometry, and topology. An oral exam in a special area of concentration. Demonstration of proficiency in one of the following languages: French, German or Russian. Proficiency is to be demonstrated by passing a journal/translation examination administered by the department. The culminating requirement for the Ph.D. degree is writing and successfully defending a dissertation that presents the results of the original and independent mathematical research that students have carried out, with the guidance of a faculty member.

Continuation Standards

Students must maintain a cumulative grade point average (GPA) of 3.00 in all graduate/professional courses.

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.

Course	Title	Credits
Year One		
Fall		
Participation in first-year mentoring program		
!MATH 5110	Algebra I	3
!MATH 5310	General Topology I	3
MATH 5021	Introduction to Analysis	3
	Credits	9
Spring		
!MATH 5120	Algebra II	3
!MATH 5320	General Topology II	3
MATH 5022	Metric Spaces	3
	Credits	9
Year Two		
Fall		
!MATH 5210	Real Analysis	3
!MATH 6410	Differential Geometry I	3
MATH 6980	Graduate Reading Course	3
	Credits	9
Spring		
MATH 5220 or MATH 5230 or MATH 5240	Complex Analysis or Functional Analysis or Harmonic Analysis	3
!MATH 6420	Differential Geometry II	3
MATH 6980	Graduate Reading Course	3
	Credits	9
Year Three		
Fall		
!MATH 6990	Dissertation Research	3
MATH 6XXX	Topics course or Graduate Reading Course	3
	Credits	6
Spring		
!MATH 6990	Dissertation Research	3
MATH 6XXX	Topics course or Graduate Reading Course	3
	Credits	6
Year Four		
Fall		
!MATH 6990	Dissertation Research	3
	Credits	3
Spring		
!MATH 6990	Dissertation Research	3
	Credits	3
	Total Credits	54

Program Notes

This is presented as one example of how a student could complete the PhD in four years, or perhaps an additional two semesters of 0-credit Dissertation research would lead to a 5 year Ph.D.

All Ph.D. students are required to take the 4 graduate sequences in Algebra (MATH 5110 Algebra I (3 cr) and MATH 5120 Algebra II (3 cr)), Analysis (MATH 5210 Real Analysis (3 cr) and one of MATH 5220 Complex Analysis (3 cr)/MATH 5230 Functional Analysis (3 cr)/MATH 5240 Harmonic Analysis (3 cr)), (MATH 5310 General Topology I (3 cr) and MATH 5320 General Topology II (3 cr)), and (MATH 6410 Differential Geometry I (3 cr) and MATH 6420 Differential Geometry II (3 cr)). There is no required order in which these courses must be completed, and some students may choose to take 3 sequences during their first year instead of the two listed above. In addition to these courses, students must pass three comprehensive exams in their choice of Algebra, Analysis, Topology, or Differential Geometry.

Students arriving with a bachelor's degree must complete 48 credits in 4000, 5000, or 6000 level courses, with at most 9 of these credits at the 4000 level. They also must complete 12 credits of dissertation research.

Students arriving with a master's degree in mathematics must only complete 24 credits at the 5000 or 6000 level as well as 12 credits of dissertation research. These 24 credits can be reached by completing the four core graduate sequences.

Contact Us

For more information about our program, please contact:

Jim Gill, Ph.D.
Graduate Program Coordinator
Department of Mathematics and Statistics

jim.gill@slu.edu