

## The Ph.D. Degree in Mathematics at Saint Louis University

The requirements for the Ph.D. in mathematics comprise coursework, written examinations, a language examination, an oral examination, and writing and defending a dissertation. In addition, there is an important procedural step called “advancement to candidacy.”

### *Coursework*

Students who enter the Ph.D. program with a bachelor’s degree in mathematics must complete 48 credit hours (16 courses) in mathematics at the 400 level or higher, in addition to twelve hours of dissertation research (MATH 699). At most 9 of these 48 hours can be at the 400-level with the remaining 39 hours at the 500 or 600-level. For those who enter with a master’s degree in mathematics, the requirement is 24 hours (8 courses) of coursework at the 500 or 600-level plus twelve hours of dissertation research. All Ph.D. students must complete the 500-level sequences in algebra, analysis, and topology, as well as the 600-level sequence in differential geometry. Beyond that, students choose a set of courses that provide them with a broad knowledge of mathematics and a deep understanding of their intended research area. The department routinely offers a variety of electives determined by student and faculty interest. Full time students typically take three courses each semester, including reading courses and dissertation research.

### *Written examinations*

Ph.D. students must pass three-hour written examinations in three of the four areas covered by the 500-level and 600-level sequences: algebra, analysis, topology, and differential geometry. These examinations are given three times each year – at the beginning of each semester, and at the end of the spring semester. Students should take these examinations as soon as possible after completing the relevant coursework and must, in any case, attempt them within 10 months of completing the relevant coursework. However, if the sequence was completed before entering our PhD program the exam must be taken within ten months of entering the PhD program. A student who fails any written examination twice ordinarily cannot continue in the Ph.D. program.

### *Language examination*

Ph.D. students must pass a written examination in one of the following languages: French, German, and Russian. The examination consists of translating a mathematical journal article that is written in one of those languages.

### *Oral examination*

After a Ph.D. student has completed the written examinations and chosen a dissertation advisor and an area of research, she or he must pass an oral examination administered by a committee of five faculty members. This oral examination involves a presentation on the student’s area of intended research, followed by questions from the examiners.

### *Advancement to candidacy*

After passing the written and oral Ph.D. examinations, the student is eligible to “advance to candidacy.” This step involves writing a prospectus for the dissertation and identifying the three faculty members who will serve as readers of the student’s dissertation. Students who want to apply for certain Graduate School fellowships, such as Dissertation Fellowships, must have advanced to candidacy.

### *Dissertation*

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 the student has carried out, with the guidance of a faculty member.

### *Additional requirements*

A Ph.D. student must obtain at least a 3.0 GPA overall. If the GPA is lower than a 3.0, then the teaching assistantship cannot be renewed for the next year.

### *Financial Support*

A graduate student can receive total of up to 5 years of support from Saint Louis University as a teaching assistant, including support received while in the master’s and the doctoral program. Renewal of the assistantship from year to year is not guaranteed, as the student needs to demonstrate sufficient progress towards the degree.