

# MATHEMATICS

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## Degree Requirements

### Master of Arts (M.A.)

Requirements listed here are in addition to Graduate Council policies listed under GCAC-600 Research Degree Policies. (<https://gradschool.psu.edu/graduate-education-policies/>)

For the M.A. degree the department offers two options:

1. the thesis option requires 12 credits of approved 500-series or 600-series courses in mathematics, 6 to 9 credits of thesis, sufficient credits in approved 400- or 500-series courses to make a total of 30 credits, and a final oral examination based on the thesis and general course material; and
2. the nonthesis option requires 18 credits of 500-series courses in mathematics, sufficient credits in approved 400- or 500-series courses to make a total of 30 credits, and a term paper on an approved topic in mathematics. No final examination is given in this option. Under this option a student may also elect to take a minor in applied mathematics (9 credits with at least 6 at the 500 level) and may use these credits toward the necessary 30 credits. For both options, a grade of A or B is required in all courses.

### Doctor of Philosophy (Ph.D.)

Requirements listed here are in addition to Graduate Council policies listed under GCAC-600 Research Degree Policies. (<https://gradschool.psu.edu/graduate-education-policies/>)

All doctoral students are required to take three qualifying examinations. Two of these examinations must be completed prior to the beginning of the student's second year of graduate study, and the third prior to the beginning of the third year. The qualifying examinations are in the areas of analysis, algebra, and topology/geometry.

The qualifying examinations are given twice a year--after the end of the spring semester and before the beginning of the fall semester. Basic, one-year sequences are offered in each subject annually to help students prepare for the examinations. Typically, an entering Ph.D. student takes two of the basic sequences in the first year and the third basic sequence in the second year of study, and takes the qualifying examinations in the spring after completing the corresponding courses. If an examination is failed, the student must take it again. Students who fail a qualifying examination in a given subject twice may not continue in the Ph.D. program.

Entering Ph.D. students may take one or more of the qualifying examinations on arrival in August without penalty. If they fail a pre-entrance exam, they still have two more opportunities to pass it. Entering Ph.D. students are advised to take at least two basic sequences (in the subjects they did not pass qualifying exams in on arrival) and the subsequent qualifying exams in the first year of graduate study.

After passing all three qualifying exams, students are expected to select a dissertation adviser and form a Ph.D. committee. The committee administers the comprehensive exam (no later than the end of the seventh semester of study) and offers counsel of the student as his or her research progresses.