

MATHEMATICS (PH.D.)

Admission to this program is contingent upon admission to the Graduate School (<http://bulletins.wayne.edu/graduate/general-information/admission/>). Doctoral applicants must have completed a master's degree in mathematics or reached an equivalent level of advancement. The Department Graduate Committee may make exceptions to this rule in cases where unusual ability has been demonstrated. Admission to the doctoral program will be granted only to those whose records indicate an ability to succeed in advanced study and research.

All applicants for the degree of Doctor of Philosophy with a major in mathematics are urged first to study the general doctoral degree requirements (<http://bulletins.wayne.edu/graduate/general-information/degree-certificate-requirements/#doctoraldegreesphdtext>) and to plan their programs so that all those requirements are fulfilled in the proper order and at the proper times. On the next tab are the major steps in earning this degree. Specific requirements of the Mathematics Department are included.

Candidates for the doctoral degree must complete ninety credits in course work beyond the bachelor's degree, including thirty credits of dissertation direction. Specific requirements for this degree in mathematics are as follows:

Preliminary Examinations: These are two-hour written examinations covering undergraduate level material from a sophisticated point of view. Students are required to pass a preliminary exam in Algebra or Analysis, as well as one additional exam from the following four choices:

- Algebra
- Analysis
- Applied Mathematics
- Probability and Statistics

Students may choose to take exams in their first semester in the Ph.D. program, in which case they must satisfy the requirements by the end of their second semester; or they may choose to take exams in their second semester, in which case they must satisfy the requirements by the end of their third semester. Students must select exams at the beginning of each semester, to be taken later in that semester.

Under special circumstances, the Departmental Graduate Committee may approve petitions on an individual basis for exceptions to these rules.

Course Requirements: In addition to the examinations described above, before advancement to candidacy every student in the Ph.D. program must earn a grade of 'B' or better in one course in each of the three subject areas in which they do not pass a Preliminary Examination. The courses may be selected from the following choices:

Code	Title	Credits
MAT 7400	Advanced Algebra I	4
MAT 7600	Real Analysis I	3
MAT 7200	Ordinary Differential Equations	3
or MAT 7210	Partial Differential Equations	
MAT 7700	Advanced Probability Theory I	3
or STA 7810	Advanced Statistics Theory I	
MAT 7500	Topology II	3
or MAT 7510	Algebraic Topology I	

As a general rule, students are expected to take at least one required course each semester until they fulfill their course requirements. Under

special circumstances, the Departmental Graduate Committee may approve petitions on an individual basis for exceptions to these rules.

QUALIFYING EXAMINATIONS consist of two sections, a written and an oral examination. A student must begin the written qualifying examination by the end of the third year in the Ph.D. program, and must pass all parts of the examination by the end of the fourth year in the Ph.D. program. All parts of the examination must be passed before a student can advance to Candidacy Status.

Written Qualifying Examinations consist of two three-hour parts, a *major* and a *minor* area exam. The examination committee will give the student a list of topics in the student's area of specialization. These topics should both reflect the student's particular research interest and be of sufficient breadth to cover the entire area. The committee will also designate a minor area on which the student will be examined. The minor area is to be supportive of the major area but sufficiently different to avoid compromising the diversity of the total two-part exam.

Oral Qualifying Examinations: By University regulations, after passing the written Qualifying Examinations, a student must take an oral Qualifying Examination; Departmental policy mandates that the exam must be taken within thirty days after certification of passing the written exam. The oral examination committee consists of the written examination committee, and a representative of the Graduate Committee. The oral examination will normally cover material similar to that of the written examinations, but may also include material outside the written examination areas which is deemed relevant to the student's research work.

Dissertation: The thirty credit dissertation registration requirement is fulfilled by registering for the courses MAT 9991, MAT 9992, MAT 9993, and MAT 9994 (Doctoral Dissertation Research and Direction I, II, III, and IV, respectively), in consecutive academic year semesters.

Defense of Dissertation: Candidates must pass a final oral examination covering their research after the candidate's advisor has approved the completed dissertation.

Academic Scholarship: All course work must be completed in accordance with the regulations of the Graduate School (<http://bulletins.wayne.edu/graduate/general-information/academic-regulations/>) and the College of Liberal Arts and Sciences (<http://bulletins.wayne.edu/graduate/college-liberal-arts-sciences/academic-regulations/>).