Ph.D. in Mathematics

Students in mathematics are expected to develop competence in real and complex analysis and at least two areas chosen from applied mathematics, dynamical systems, functional analysis, numerical analysis, partial differential equations, probability, topology or other topics the student's committee may approve.

The student's graduate committee determines additional requirements. Degree candidates are expected to be familiar with both departmental and The Graduate School degree requirements, those requirements can be found online at the Graduate School webpage. (http://www.montana.edu/gradschool/policy/degreqDoctoral.html#degreq_doc_def)

Departmental Requirements
Described below are the Department of Mathematical Sciences requirements for the Ph.D. in Mathematics. These departmental requirements supplement those set out by the Graduate School in the Graduate Catalog for Ph.D. Students.

There are no foreign language requirements or qualifying exam for a Ph.D. in Mathematics.

Ph.D. Committee
- The Ph.D. committee must include a minimum of five members excluding the optional Graduate Representative.
- A committee must be formed before the end of the student's third semester of study.
- The Committee Chairperson (Advisor) must be a Tenure Track faculty member within the Department of Mathematical Sciences.
- The first three committee members listed on a candidate's Program of Study are required to read and assess the dissertation.

Course Requirements
- A minimum of 60 credit hours are required (30 credits can be from a Master's degree program).
- A minimum of 18 credit hours of Doctoral Thesis (M 690) must be taken.
- The Ph.D. student’s Program of Study listing their intended coursework must be approved by all committee members.

Typically, a Ph.D. student takes 18 credits of mathematics in courses numbered 500 or higher to prepare for their comprehensive examination. Students are encouraged to begin some form of doctoral reading or research (either informally or in the form of M 689 credits) with a committee member by their second year of study.

Ph.D. In Mathematics Comprehensive Exam
The Ph.D. Comprehensive examination consists of both a written and an oral component. The candidate must pass the written component of the comprehensive exam before taking the oral component of the comprehensive examination.

Written Comprehensive Exam
How a student may choose and retake exam components is determined by all of the following:

1. The written comprehensive exam consists of 4-hour exam components graded as Pass or Fail.

2. The candidate must pass three components to pass the written component of the comprehensive examination though they may attempt more.

3. If a candidate fails a component it may be attempted at most one more time.

4. The candidate must pass the following "required" component:
   a. Measure Theory (M 547) - Complex Analysis (M 551)

5. Normally the remaining components are from the following list of "standard" components:
   a. General Topology (M 511) - Geometry & Algebraic Topology (M 512)
   b. Dynamical Systems I (M 595) - Dynamical Systems II (M 596)
   c. Functional Analysis I (M 584) - Functional Analysis II (M 585)
   d. Numerical Solution of Partial Differential Equations I (M 581) - Numerical Solution of Partial Differential Equations II (M 582)
   e. Partial Differential Equations I (M 544) - Partial Differential Equations II (M 545)
   f. Methods of Applied Mathematics I (M 560) - Methods of Applied Mathematics II (M 561)
   g. Measure Theory (M 547) - Probability Theory (M 586)

6. At most one "nonstandard" component not from the "standard" components (list above) may be taken. To take such a component, a petition form must be completed.

7. Students entering the Mathematics Ph.D. program from the Mathematics M.S. program who pass both written components of the M.S. comprehensive exam at the Ph.D. level need only take two Ph.D. written comprehensive exams from the list above. Students entering the Ph.D. program from another institution may also sit for the written M.S. comprehensive exam immediately upon entrance to the Ph.D. program. If the student student scores a Ph.D. level pass on both components of the exam in one attempt, then the student may use this Ph.D. level pass to satisfy one of the three written components of the written Ph.D. comprehensive exam.

Oral Comprehensive Exam
After passing the written comprehensive exam the candidate must pass an oral comprehensive exam at a date agreed upon by the candidate's committee. Normally the oral comprehensive exam is a thesis topic proposal where the candidate's ability to conduct research on the proposal is assessed. When this is not the case, the candidate will be informed of the nature of the oral comprehensive exam by their committee. The candidate has at most two attempts to pass the oral comprehensive examination.

Ph.D. in Mathematics Dissertation Requirements
The dissertation should embody the results of extended research by the candidate, be an original contribution to knowledge, and include new material worthy of publication. All committee members must have access to a dissertation draft at least four weeks prior to the Final Defense. The dissertation must be submitted as an electronic dissertation, in final form to the Graduate School not later than 14 working days before the end of the term in which graduate work is completed.

Ph.D. in Mathematics Final Defense
Departmental policies on the final defense and all other administrative procedures regarding the degree completion are exactly those as set out by The Graduate School.
Font Notice

This document should contain certain fonts with restrictive licenses. For this draft, substitutions were made using less legally restrictive fonts. Specifically:

Times was used instead of Adobe Garamond Pro.

The editor may contact Leepfrog for a draft with the correct fonts in place.