Ph.D. in Mathematics - Mathematics Education Emphasis

Program Overview
The Ph.D. in Mathematics with an emphasis in mathematics education combines study in advanced mathematics, mathematics education, and quantitative and qualitative research methods in education. This pathway is designed for candidates who plan a future of teaching, research, and service focused on mathematics education in K-12 settings. The program focuses on the teaching and learning of K-12 mathematics including curriculum, instruction, assessment, and teacher preparation or professional development in the K-12 education system. Graduates typically go on to faculty positions in mathematics departments that involve teacher preparation and research in K-12 mathematics education. Applicants are expected to possess K-12 teaching experience or to gain such experience through internships.

Admission (preferred qualifications)
• An earned master’s degree in mathematics, statistics, or mathematics education, including graduate-level mathematics coursework in topics such as algebra and analysis. Applicants with a strong undergraduate degree in mathematics teaching may start in the M.S. in Mathematics program and earn an M.S. before continuing on to the Ph.D., usually after 2 years.
• One of the following:
  • Teacher licensure in secondary mathematics
  • Two years K-16 teaching experience

Required Equivalencies (upon completion of coursework)
Provisional Licensure: All graduates of this program are expected to acquire a minimum level of competency in secondary mathematics instruction, comparable to satisfying the requirements for Montana’s provisional license to teach mathematics. This includes a Bachelor of Science degree in mathematics and at least six credit hours of education coursework. Ph.D. candidates who fall short of the six-credit requirement will select courses from the following:
• Complete a secondary mathematics methods course Methods: 9-12 Mathematics (EDU 497) or Methods: 5-8 Mathematics (EDU 497R)
• Complete either Access and Equity in Mathematics Teaching (M 520), Mathematics Learning Theory for Teaching (M 521), or another approved course.

K-12 Classroom Experience: Students who lack sufficient exposure to instruction at the elementary or secondary level will be required to complete school-based internships prior to beginning dissertation research. Each internship calls for 135 hours of field experience as well as participation in a spring seminar that may address reviews of research, lesson study, analysis of student work, and reflection on classroom experiences.
• Elementary internship: teach, tutor, and observe students in a K-8 classroom
• Secondary internship: teach one or more courses at the high school level

Comprehensive Examinations
Graduates of the program earn the equivalent of a master’s degree in mathematics, and must successfully complete a comprehensive examination in mathematics. Two additional examinations address knowledge related to K-12 mathematics’ teaching and learning and educational research design.
• One comprehensive exam in Mathematics. This exam will be
determined by the graduate committee and administered according to
the guidelines for mathematics.
• One comprehensive exam in Mathematics Education. This exam
is developed and scored by the current (or most recent) instructors
of Curriculum Design (M 528) and Assessment Models and Issues
(M 529).
• One comprehensive exam in Educational Statistics and Research
Methods. This exam is collaboratively developed by the current
(or most recent) instructor of Research in Mathematics Education
(M 534) and appropriate research methods faculty in Statistics and
Education.

Dissertation Research Component
The dissertation is a study in mathematics education. Scholarship in
mathematics education examines teaching and learning, with roots in
the disciplines of mathematics and educational theory and practice. It is
grounded in mathematics content through the study of curriculum and
mathematical practice and is generally carried out through social science
research methods, including both qualitative and quantitative analysis.
Mathematics education research at Montana State University adopts an
applied approach, and research efforts often focus on the development
and ongoing support of K-12 mathematics teachers. Doctoral students
counter research in areas relevant to current faculty research interests or
funded projects.
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.