

Mathematics Education PhD Program at Ohio University

Ohio University offers a PhD in Curriculum and Instruction with a specialization in Mathematics Education. This program develops scholars who study teaching, learning, and assessment in mathematics—kindergarten through college. The program prepares these scholars to act as stewards of the field of mathematics education, with all its complexity and diversity.

A key strength of the program is its ability to provide individualized programs of study for scholars with a wide variety of interests who seek to serve as leaders in various facets of mathematics education. The program participants conduct research in curriculum, instruction, learning, assessment, professional development, teacher beliefs, and student attitudes. Students in the PhD program not only learn how to conduct such research but also serve in apprenticeship roles in teacher preparation and professional development to prepare them for university faculty positions and other leadership roles in mathematics education.

The PhD program in Mathematics Education is built on a common foundation of learning theory, curriculum and instruction theory, social and cultural contexts of education, ethics, and quantitative and qualitative research methods, which is then extended to a profound understanding in mathematics and mathematics education. For each individual scholar, this foundation plus specialization serves as the basis for investigating a significant educational issue that will advance the field of mathematics education and prepare the scholar for future research. A typical program consists of the following components:

Foundation

Teacher Education Core (25 quarter hours)

EDTE 715.	Theories of Curriculum Change	5 qtr hr
EDTE 716.	Theories of Instructional Design and Evaluation	5 qtr hr
EDTE 719.	Curriculum and Instruction Practicum	6 qtr hr
EDTE 800.	Advanced Dynamics of Human Learning	5 qtr hr
EDTE 804.	Writing for Professional Publication in Education	4 qtr hr

Students are encouraged to take additional courses in teacher education, instructional technology, cultural studies, ethics, or other areas of professional education to broaden their foundation.

Quantitative and Qualitative Research Methods (19 quarter hours)

EDRE 720. ¹	Educational Statistics	5 qtr hr
EDRE 750. ¹	Introduction to Qualitative Methods in Education	4 qtr hr
EDRE 721.	Regression Analysis in Education	5 qtr hr
EDRE 733. ²	Research Design in Education	5 qtr hr

Most students take additional course work in EDRE or work in *research tools* in preparation for their dissertation. Examples of research tools are computer languages and applications, historiography, philosophy, foreign language, and additional specific qualitative or quantitative research methods. Students may find some research courses in departments outside of Education.

¹ Required, to be taken early in the program

² Highly recommended, to be taken near the end of the coursework phase of the program

Specialization (35 quarter hours)**Mathematics (15–25 quarter hours)**

Students entering the program are expected to have a level of mathematics preparation equivalent to a master's degree in mathematics education. Those with less preparation will be expected to reach this level early in the program. Selection from the following courses is recommended for those who have not already completed similar graduate-level mathematics courses:

MATH 500.	History of Mathematics	4 qtr hr
MATH 511.	Linear Algebra	4 qtr hr
MATH 513A, B.	Introduction to Modern Algebra	8 qtr hr
MATH 539.	Topics in Geometry	4 qtr hr
MATH 543.	Mathematical Modeling and Optimization	4 qtr hr
MATH 544.	Introduction to Numerical Analysis	4 qtr hr
MATH 550A.	Theory of Statistics	4 qtr hr
MATH 560A.	Advanced Calculus	4 qtr hr

Students are not bound by this list of courses, but regardless of their prior graduate-level mathematics course work, they are expected to complete at least 15 quarter hours of mathematics beyond their master's degree at the 500-level or above.

Mathematics Education (16–20 quarter hours)

EDTE 890.	Mathematics Education through the Lens of Curriculum	4 qtr hr
EDTE 890.	Mathematics Education through the Lens of Technology	4 qtr hr
EDTE 890.	Mathematics Education through the Lens of Assessment	4 qtr hr

In addition to these three core courses, students take additional courses, such as the following:

EDTE 890.	Research in Education: Readings in Mathematics Education	4 qtr hr
EDTE 890.	Research in Education: Research in Mathematics Education	4 qtr hr

Comprehensive Examinations**Written and Oral Exams**

Once the student has completed an approved program of course work as described above, a committee of professors examines the students in areas of (a) teacher education, (b) research methods, (c) mathematics, and (d) mathematics education. The student prepares written responses to comprehensive exam questions in these four areas and then meets with the committee for a follow-up oral exam.

Culminating Investigation and Associated Product**Dissertation (15 quarter hours)**

The student proposes, conducts, and prepares a comprehensive written report of an individually designed research study addressing a significant educational issue that will advance the field of mathematics education and will prepare the scholar for future research.