Mathematics

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Admission Criteria

Prerequisites

Students should have completed undergraduate mathematics (15 credits or more) including a calculus sequence and linear algebra. An undergraduate major in mathematics or additional mathematics courses beyond linear algebra will be helpful but not necessary. Consult The Graduate School Web site (www.jmu.edu/grad) for application information. Contact those listed at the top of this page with questions about entrance requirements.

To Apply

Prospective students should visit the Web site of The Graduate School at JMU, where students will find links with information about the application process, as well as an online application.

After completing and submitting an application, contact Laurie Cavey, Judy Kidd or David Carothers.

Mission

The Master of Education in mathematics prepares high school teachers for positions of instructional leadership as master teachers of mathematics. The program extends the professional competence of high school mathematics teachers through an in-depth study of mathematics and mathematics teaching and learning. Program participants will demonstrate their knowledge through individual and collaborative projects and presentations, field-based curriculum implementation and evaluation, and the use of reflective classroom inquiry.

The program, which is a collaborative effort of the College of Education and the Department of Mathematics and Statistics, is designed to provide opportunities for mathematics teachers to deepen their understanding of mathematics by learning advanced mathematical topics in relation to the mathematics they actually teach. The program will also help prepare teachers to teach advanced secondary mathematics courses, such as Advanced Placement Calculus or Statistics. The proposed mathematics education courses will provide opportunities for teachers to learn math-specific technologies for learning, how to implement appropriate mathematics curriculum and how to continue to develop as professional educator. In addition, the program is designed to develop teachers' understanding of and ability to apply education research within their own practice. As a culminating project, teachers will conduct research in their own classrooms, where they analyze how aspects of their own practice impacted their own as well as their students' learning. The program content is consistent with the recommendations of the Mathematical Education of Teachers' report of the Conference Board of the Mathematical Sciences.

Plan of Study

The Master of Education in mathematics includes a minimum of 34 credit hours of course work organized as follows: educational inquiry, four hours; mathematics education, nine hours; mathematics, 21 hours. The student must also complete a comprehensive examination.

Master of Education in Mathematics Degree Requirements

Course Requirements

Credit Hours	
EDUC 630. Inquiry in Education	3
EDUC 631. Seminar in Educational Inquiry	1
MAED 600. Seminar in Mathematics Education	3
MAED 610. Curricular Trends in Mathematics Teaching and Learning	3
MAED 620. Teaching Mathematics with Technology	3
MATH 510. Analysis and Applications for Teachers	3
MATH 512. Discrete Mathematics and Applications for Teachers	3
MATH 514. Algebra for Teachers	3
MATH 517. Probability and Statistics for Teachers I	3
MATH 520. Geometry for Teachers	3
MATH 615. History of Mathematics	3
MATH 618. Probability and Statistics for Teachers II	3
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Course Offerings

Mathematics Education

MAED 600. Seminar in Mathematics Education. 3 credits.
This survey course is designed to familiarize teachers with current research topics related to mathematics teaching and learning. Research topics include teacher professional development, mathematical reasoning (e.g., algebraic, geometric, multiplicative, proportional, arithmetical); implementation of standards-based curriculum, assessment of student learning, the role of representations, teaching for problem solving and theories that frame research.

MAED 610. Curricular Trends in Mathematics Teaching and Learning. 3 credits.
This course offers opportunities for teachers to explore curricular goals and implementations for various mathematical topics addressed in middle and secondary mathematics classrooms. Teachers will consider different curricula and how those curricula might be implemented to effectively support student learning. Mathematics topics addressed include algebra, proportional reasoning, geometry and advanced mathematics.

MAED 620. Teaching Mathematics with Technology. 3 credits.
This course offers opportunities for teachers to explore research-based applications of technology tools in secondary and middle school mathematics. Teachers will engage in advanced use of various technology tools for learning and teaching mathematics, including designing technology environments, appropriate investigation tasks, and professional developmental activities.

Mathematics

MATH 510. Analysis for Teachers. 3 credits.
A course to update and broaden secondary teachers' capability and point-of-view with respect to topics in analysis. Applications of concepts such as limits, continuity, differentiation and integration. May be taken for graduate credit and for certificate renewal by secondary school teachers. *Prerequisites: Undergraduate analysis or permission of instructor.*

MATH 512. Discrete Mathematics for Teachers. 3 credits.
A course to update and broaden secondary teachers' capability and point-of-view with respect to topics in discrete mathematics. May be taken for graduate credit for certificate renewal by secondary school teachers. *Prerequisite: Undergraduate mathematics through linear algebra.*

MATH 514. Algebra for Teachers. 3 credits.
From an advanced viewpoint, an investigation of topics in algebra from high school curriculum. Theory of equations, polynomial rings, rational functions and elementary number theory. Course may be taken for graduate credit and for certificate renewal by secondary school teachers. *Prerequisite: Undergraduate algebra or permission of instructor.*

MATH 520. Geometry for Teachers. 3 credits.
Topics in geometry of concern to secondary teachers in their work and provision for background and enrichment. Various approaches to study of geometry, including vector geometry, transformational geometry and axiomatics. Course may be taken for graduate credit and for certificate renewal by secondary teachers. *Prerequisite: Undergraduate mathematics through linear algebra or undergraduate geometry.*

MATH 615. History of Mathematics. 3 credits.
Topics in the history of mathematics of particular concern to secondary teachers in their work and provision for background and enrichment. Selected topics spanning ancient times to the present. Course may be taken for graduate credit and for certificate renewal by secondary teachers.

MATH 618. Probability and Statistics for Teachers II. 3 credits.
A course to update and broaden secondary teacher's capability and point-of-view with respect to selected topics in statistics and to prepare teachers to teach AP statistics. Course may be taken for graduate credit and for certificate renewal by secondary school teachers. *Prerequisite: MATH 517.*

MATH 685. Selected Topics II. 3 credits.
An in-depth study of selected topics not otherwise covered in the regular offerings of the department. May be repeated for credit when course content changes.