MATHEMATICS EDUCATION (MTED)

Courses

MTED 604 MATHEMATICAL STRUCTURE OF NUMBERS AND OPERATIONS IN BASE 10 (3)

A thorough and rigorous treatment of concepts in number and operations, with attention to the mathematical structure underlying whole number and decimal operations in the Base 10 number system. These topics will be investigated through a variety of models, representations, and contexts, as well as through solving non-routine problems. Attention to student thinking, potential misconceptions and how to address them, alignment to standards, and use of technological and manipulative tools are integrated throughout.

MTED 605 MIDDLE SCHOOL MATHEMATICAL METHODS AND PROBLEM SOLVING (3)

Best practices for delivery and assessment of mathematical concepts and skills relevant to the middle school level of instruction. Topics include problem solving, geometry and measurement, number sense, data analysis and probability, and algebra. Cannot be used for any other graduate program in the mathematics department. Prerequisites: Admission to the Master's program in Mathematics Education or approval of the department.

MTED 610 STUDENT THINKING IN RATIO AND PROPORTIONAL REASONING (3)

Pedagogical content knowledge in the domain of proportional reasoning, rational numbers and ratios. Specific topics include representations of rational numbers as both decimals and fractions, unpacking the conceptual basis for algorithms, and solving non-routine problems. Attention to student thinking (including possible misconceptions), alignment to the Common Core State Standards for Mathematics, and the use of technological and manipulative tools are integrated throughout.

MTED 611 ALGEBRA IN THE SCHOOL CURRICULUM (3)

A thorough and rigorous treatment of topics in algebra, including: patterns and sequences; functions (linear, quadratic, exponential, and others); expressions and equations; systems of equations; graphs and tables; and connections between algebra and other branches of mathematics. These topics will be investigated through a variety of models, representations, and contexts, as well as through solving non-routine problems. Attention to student thinking, potential misconceptions and how to address them, alignment to the Common Core State Standards for Mathematics, and use of technological and manipulative tools are integrated throughout. Prerequisite: program admission or approval of the department.

MTED 612 DATA ANALYSIS FOR MIDDLE SCHOOL TEACHERS (3)

Topics from statistics and probability, and recent methodologies and standards for data analysis in middle school level. The course also offers activities using Fathom-a computer learning environment for data analysis and statistics. Cannot be used for any other graduate program in the mathematics department. Prerequisites: Admission to the Master's program in Mathematics Education or approval of department.

MTED 613 MATHEMATICAL MODELING IN THE SCHOOL CLASSROOM (3)

Construction and evaluation of mathematical models to solve complex problems, and applications of the modeling process to K-12 education. Examination of a variety of representations, strategies, and mathematical tools that can be used to describe real-world phenomena, across multiple modeling types, contexts, and domains of K-12 mathematics education. Includes a focus on strategies to support K-12 students during mathematical modeling, creating and adapting model-eliciting activities for classroom use, modeling to support equity and social justice, and integration of modeling into the mathematics curriculum.

MTED 614 CALCULUS THROUGH TECHNOLOGY FOR MIDDLE SCHOOL TEACHERS (3)

Intuitive calculus of one variable, modeling best practices. Topics include limits, differentiation, integration and applications of calculus. Graphing calculators and other computer-learning environments such as Mathematica are included. Cannot be used for any other graduate program in the Mathematics Department. Prerequisite: MATH 613 or approval of the department.

MTED 615 GEOMETRY FOR MIDDLE SCHOOL TEACHERS (3)

Geometric vocabulary, relationships, concepts and skills in two and three dimensions; topics include a review of Euclidean Geometry, Coordinate and Transformational Geometries, Tessellation, Polyhedra, Measurement, and the use of appropriate technology in the classroom. Cannot be used for any other graduate program in the Mathematics Department. Prerequisite: Admission to Masters Program in Mathematics or approval of the department.

MTED 620 MATHEMATICS EDUCATION LEADERSHIP FOR EQUITY (3)

Principles of effective school leadership and their application to equity-focused mathematics teacher leaders. Special focus will be given to an examination of critical challenges in school mathematics and the role of teacher leaders in ensuring that mathematics is relevant, meaningful, inclusive, and accessible for every student.

MTED 650 MATHEMATICS IN INTEGRATED STEM EDUCATION (3)

Students investigate standards-based mathematical practices and concepts, and consider how teachers teach and students learn about these practices and concepts in the context of thematic, integrated STEM (Science, Technology, Engineering & Mathematics) education in grades PreK-12.

MTED 880 MATHEMATICS EDUCATION GRADUATE PROJECT (3)

An investigation of a question or problem in mathematics education, using an acceptable research method and design, conducted under the direction of one or more faculty advisors. Requirements for successful completion of the course consist of one or more of the following outcomes: (i) Submission of a proposal for an oral or poster presentation at a conference; (ii) a departmental seminar or presentation; or (iii) a project report. May be repeated for a maximum of 6 units. Graded S/U.

MTED 885 MATHEMATICS EDUCATION GRADUATE PROJECT CONTINUUM (1)

Students who cannot complete MTED 880 in one semester will then register for MTED 885, one unit, in the next semester. Except in special circumstances, MATH 885 cannot be repeated. S/U Grading.