

# Ped Cntnt Kldg Tch Ele Mid Mth (MTHE)

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## Courses

### **MTHE-401. Number And Operations For Elementary And Middle School Teachers. 3 Hours.**

Number and Operations for Elementary and Middle School Teachers examines the three main categories in the Number and Operations strand of Principles and Standards of School Mathematics (NCTM)-- understanding numbers, representation, relationships, and number systems; the meanings of operations and relationships among those operations; and reasonable estimation and fluent computation. Topics include: what is a number system?; number nets, infinity, and zero; place value; meanings and models for operations; divisibility tests and factors; fractions and decimals; rational numbers and proportional reasoning; and fractions, percents, and ratios. Students will also examine how course topics connect to the elementary and middle school curriculum.

### **MTHE-402. Patterns, Functions, And Algebra For Elementary And Middle School Teachers. 3 Hours.**

Patterns, Functions, and Algebra for Elementary and Middle School Teachers explores the "big ideas" in algebraic thinking. Topics include: finding, describing, and using patterns; using functions to make predictions; understanding linearity and proportional reasoning; understanding non-linear functions; and understanding and exploring algebraic structure. Students will also examine how course topics connect to the elementary and middle school curriculum.

### **MTHE-403. Geometry And Measurement For Elementary And Middle School Teachers. 3 Hours.**

Geometry and Measurement for Elementary and Middle School Teachers introduces geometric reasoning as a method for problem-solving and examines some of the major ideas in measurement. Topics include: properties of geometric figures; making constructions using pencil and paper; using dynamic software; practice using mathematical language to express ideas and justify your reasoning; the basis of formal mathematical proofs and solid geometry; procedures for measuring and learning about standard units in the metric and customary systems; the relationship among units; and the approximate nature of measurement. Students will also examine how course topics connect to the elementary and middle school curriculum.

### **MTHE-404. History Of Mathematics For Elementary And Middle School Teachers. 3 Hours.**

The History of Mathematics for Elementary and Middle School Teachers examines the historical development of mathematical ideas with an emphasis on connections to the elementary and middle school curriculum and the mathematical contributions of a diversity of world cultures. Special attention will be given to the interplay between mathematical ideas and the social and cultural context in which these ideas developed. Mathematical topics include numeration systems, number theory, algebra, geometry, probability and combinatorics.

### **MTHE-438. Data Analysis, Probability, And Statistics For Elementary And Middle School Teachers. 3 Hours.**

Data analysis, Probability, and Statistics for Elementary and Middle School Teachers introduces statistics as a problem-solving process. Students will build their skills through investigations of different ways to collect and represent data and to analyze and interpret variation in data. The course covers the following topics: statistics as problem solving; data representations; describing distributions; the five-number summary; variation about the mean; designing experiments; bivariate data and analysis; probability; and sampling and estimation. Students will also examine how course topics connect to the elementary and middle school curriculum.

### **MTHE-439. Technology For K-8 Math Teachers. 3 Hours.**

This course provides students with opportunities to explore modeling, computational, and communication tools used in teaching K-8 mathematics. The course will focus on: (a) the technological, pedagogical and content knowledge (TPACK) required for implementing software and technological devices effectively in the teaching and assessment of K-8 mathematics and (b) research on the use of technology in teaching and learning K-8 mathematics.

### **MTHE-450. Equitable Mathematics Teaching For Elementary And Middle School Teachers. 3 Hours.**

This course is designed to provide elementary and middle school teachers with opportunities to discuss equity issues in mathematics education. Participants will explore the meanings of equity by reading and discussing mathematics education research articles, including those that draw on sociocultural and sociopolitical theories of learning. In this course, equity broadly refers to thinking about how to provide elementary and middle school students with access to meaningful mathematical learning opportunities and outcomes within school boundaries and how this access is tied to students' intricate experiences in broader contexts. Issues of equity include, but are not limited to, race, culture, gender, SES, disabilities, language, and sexual orientation.

### **MTHE-451. Research Trends In Elementary And Middle School Mathematics Education. 3 Hours.**

This course is designed to provide elementary and middle school teachers with opportunities to acquire knowledge about current research in mathematics education and its application to the practice of teaching. Topics include teachers and teaching, student outcomes, student learning and assessment.

### **MTHE-496. Graduate Seminar For Elementary & Middle School Mathematics Teachers. 3 Hours.**

This course is designed as a capstone for students in the Masters in Pedagogical Content Knowledge for Teaching Elementary and Middle School Mathematics program. Students are given the opportunity to explore mathematical topics of interest to them and they will connect their understanding of that topic to the teaching of elementary and middle school mathematics. Requirements include a project and presentation in addition to course assignments. Problem solving and the study of elementary mathematics from an advanced standpoint will be emphasized. Mathematical topics will vary. Program portfolios are collected at the end of this course.