

# Math Education Courses

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## **MTE 504 - Foundations of Complex Analysis**

Hours: 3

This course covers the fundamentals of classical complex analysis: the complex numbers; holomorphic functions; conformal mappings the representation of holomorphic functions by Cauchy's integral formula and its generalization; the representation of holomorphic functions by power series and Laurent Series, and their applications such as singularities of holomorphic functions, Meromorphic functions, computation of indefinite integrals by residues, the Laplace transform, the inverse Laplace transform, Fourier transform, and inverse Fourier transform; and finally the topic of harmonic functions will be explored. Note: This course will be helpful to secondary teachers by giving them a better understanding of the terms and ideas used in modern mathematics. This is an elective course, eligible fo Prerequisites: Admission to MS Math or MATH 2415 Calculus III with grade of "C" or higher. Crosslisted with: MATH 438.

## **MTE 505 - Foundations of Analysis**

Hours: 3

The theory of the real number system, the convergence of sequences and series, the limit, continuity, differentiation, and integration of functions with emphasis on the mathematical ideas, analytic skills and learning the proofs. Some topics like continuity in a metric space or a topological space may be included. This is helpful to secondary teachers by giving them a better understanding of the terms and ideas used in modern mathematics. This is an elective course, eligible for the non-thesis option of the MS degree in math only. The maximum credit hours can be earned towards the MS degree in math among MATH 500, 550, 560 is six. Prerequisites: Admission to MS Math, MATH 332, Methods of Mathematical Proof, with grade of "C" or higher. Crosslisted with: MATH 436.

## **MTE 540 - Foundations of Topology**

Hours: 3

Logic and Proofs, Sets, Functions, indexing sets and Cartesian products, equivalence and order relations, countable and uncountable sets, ordinal and cardinal numbers, sequences, convergence and uniform convergence, topology of the real line, metric spaces, separation axioms. Prerequisites: Admission to MS Math or MATH 332 Methods of Mathematics Proofs with grade of "C" or higher. Crosslisted with: MATH 440.

## **MTE 551 - Fundamental Math for Tch**

Hours: 3

Fundamental Mathematics for Teachers - Three semester hours This course is specifically designed for teachers K-8. The National Council of Teachers of Mathematics (NCTM) explains in its Principles and Standards (2000) that all mathematical learning is grounded in number and operations: Students should be able to "understand numbers, ways of representing numbers, relationships among numbers and number systems; and understand meanings of operations and how they relate to each other." This course is designed to prepare the teachers to create learning environments conducive to meeting the national and state standards regarding number and operation.

## **MTE 552 - Math Modeling Tch**

Hours: 3

Mathematical Modeling for Teachers - Three semester hours This course is specifically designed for teachers K-8. The National Council of Teachers of Mathematics (NCTM) explains in its Principles and Standards (2000) that all mathematical learning should be grounded in problem solving and mathematical reasoning. This course is designed to prepare the teachers to create learning environments conducive to meeting the national and state standards regarding problem solving, mathematical modeling, and the judicious use of technology.

## **MTE 553 - Geometric Structures for Teachers**

Hours: 3

The National Council of Teachers of Mathematics (NCTM) explains in its Principles and Standards (2000) that "geometry and spatial sense are fundamental components of mathematics learning." This course is designed to prepare the teachers to create learning environments conducive to meeting the national and state standards regarding geometry. Topics include characteristics of 2 and 3 dimensional shapes, mathematical proofs, spatial relationships, transformations and symmetry.

## **MTE 554 - Algebraic Structures for Teachers**

Hours: 3

The National Council of Teachers of Mathematics (NCTM) explains in its Principles and Standards (2000) that algebraic reasoning is a important part of mathematical study. This course is designed to prepare the teachers to create learning environments conducive to meeting the national and state standards regarding algebraic reasoning. Topics include understanding patterns, relations, functions; representing and analyzing mathematical situations and structures using algebraic symbols; using mathematical models to represent and understand quantitative relationships; and analyzing change in various contexts.

**MTE 555 - Research Techniques for STEM and Education**

Hours: 3

This course, Research Techniques for STEM and Education, will focus on Math and Education research topics that are necessary for the person who is pursuing a graduate degree and/or who wishes to work in higher education. Students will explore concepts that are integral to the research process at this level in higher education. Particular areas of study include: Institutional Review Boards (IRBs); topics of Research Conduct (Responsibility and Ethics that are related to research); grant writing for STEM areas; preparation for a MATH 595, thesis, or even a dissertation; writing research articles; and other research areas. This course is a Special Topics course and will offer students a unique opportunity to experience some areas of research, such as IRB proceedings. Prerequisites: Graduate student status.

**MTE 556 - Stat Reasoning for Teachers**

Hours: 3

National Council of Teachers of Mathematics (NCTM) explains in its Principles and Standards (2000) that statistical reasoning is essential to being an informed citizen, employee, and consumer; thus it is essential for all students. This course is designed to prepare the teachers to create learning environments conducive to meeting the national and state standards regarding statistical reasoning. Topics include formulating questions that can be addressed with data; collecting, organizing, and displaying relevant data to answer questions; selecting and using appropriate statistical methods to analyze data; developing and evaluating inferences and predictions based on data; understanding and applying basic concepts of probability. Topics on statistics and assessment may also be covered.

**MTE 557 - Prob Based Lrng Math Sci**

Hours: 3

Problem Based Learning in Mathematics and Science - Three semester hours This course is specifically designed for teachers K-12. The National Council of Teachers of Mathematics (NCTM) explains in its Principles and Standards (2000) that all mathematical learning should be grounded in problem solving and mathematical reasoning. This course focuses on project-based and problem-based learning (PBL); conducting PBL and its applications in the classroom.

**MTE 589 - Independent Study**

Hours: 1-6

Independent Study - Hours: One to Six Individualized instruction/research at an advanced level in a specialized content area under the direction of a faculty member. Prerequisites Consent of department head. Note May be repeated when the topic varies.

**MTE 597 - Special Topics**

Hours: 1-4

Hours: One to four - Organized class Note May be graded on a satisfactory (S) or unsatisfactory (U) basis. May be repeated when topics vary