

# Math Education

[MTHE 5300](#) Foundations in Algebra (3 semester credit hours) The course is designed to enhance conceptual understanding of mathematics content. Topics include variables, functions, patterns, equations, and polynomials. Emphasis on problem solving, precise reasoning, and communicating mathematics both orally and in writing. Does not count toward Master's degree in Mathematics. Must register in department office. Instructor consent required. Admission to Master of Arts (MAT) program. (3-0) R

[MTHE 5301](#) Foundations in Geometry (3 semester credit hours) The course is designed to enhance conceptual understanding of mathematics content related to Euclidean and analytic geometry, including triangles, circles, areas and volumes, trigonometric functions, and their connections with algebra. Emphasis on problem solving, precise reasoning, and communicating mathematics both orally and in writing. Does not count toward Master's degree in Mathematics. Must register in department office. Instructor consent required. Admission to Master of Arts (MAT) program. (3-0) R

[MTHE 5302](#) Foundations in Probability and Statistics (3 semester credit hours) The course is designed to provide tools to collect, display, analyze, and interpret data. Topics include basic statistics and probability, data analysis, and their applications. Emphasis on problem solving, precise reasoning, and communicating mathematics both orally and in writing. Does not count toward Master's degree in Mathematics. Must register in department office. Instructor consent required. Admission to Master of Arts (MAT) program. (3-0) R

[MTHE 5321](#) Problems Using Algebra (3 semester credit hours) Analysis of the relationship of "school algebra" to "abstract algebra," solving non-routine problems involving these concepts and adapting them for classroom use. The role of functions, the relationships between the verbal, visual, and symbolic representations of algebraic concepts, and the role of technology in learning algebra will be emphasized. May not be used to fulfill degree requirements for mathematical sciences majors except those in the Master of Arts in Teaching (MAT) program. Recommended Prerequisite: A junior-level mathematics course. (3-0) T

[MTHE 5322](#) Problems Using Geometry (3 semester credit hours) Analysis of the relationship of "school geometry" to "college geometry," solving non-routine problems involving these concepts, and adapting them for classroom use. Topics include the van Hiele levels of reasoning, geometric transformations, the role of conjecture and proof, applications of geometry, and the role of technology in learning geometry. May not be used to fulfill degree requirements for mathematical sciences majors except those in the Master of Arts in Teaching (MAT) program. Recommended Prerequisite: A junior-level mathematics course. (3-0) T

[MTHE 5323](#) Problems Using Pre-calculus (3 semester credit hours) Analysis of the relationship of pre-calculus to real analysis, solving non-routine problems involving these concepts and adapting them for classroom use. The role of functions will be emphasized. Topics include functions [polynomial, rational, trigonometric, exponential, logarithmic], measurement trigonometry, vector

functions [parametric equations], conic sections, real-world applications, and the role of technology in learning pre-calculus. May not be used to fulfill degree requirements for mathematical sciences majors except those in the Master of Arts in Teaching (MAT) program. Recommended Prerequisite: A junior-level mathematics course. (3-0) T

[MTHE 5324](#) Problems Using Discrete Mathematics (3 semester credit hours) Selected concepts in discrete mathematics. Solving non-routine problems and adapting them for classroom use and incorporating topics from discrete mathematics into existing high school courses. Topics include number theory, combinatorics, probability, and applications of matrices. Appropriate technology will be used. May not be used to fulfill degree requirements for mathematical sciences majors except those in the Master of Arts in Teaching (MAT) program. Recommended Prerequisite: A junior-level mathematics course. (3-0) T

[MTHE 5325](#) Problems Using Mathematical Modeling (3 semester credit hours) Selected concepts in mathematical modeling. Solving non-routine problems and adapting them for classroom use and incorporating topics from mathematical modeling into existing high school courses. Topics include the construction, use, and analysis of empirical and analytical mathematical models, using modeling tools such as functions, curve fitting, simulation, matrices, difference and differential equations, finite graph theory. Appropriate technology will be used. May not be used to fulfill degree requirements for mathematical sciences majors except those in the Master of Arts in Teaching (MAT) program. Recommended Prerequisite: A junior-level mathematics course. (3-0) T

[MTHE 5326](#) Problems Using Statistics and Probability (3 semester credit hours) Selected concepts in statistics and probability. Solving non-routine problems and adapting them for classroom use and incorporating topics from statistics, probability, and data analysis into existing high school courses. Topics include describing patterns in data and their variability, sampling and experimental design, exploring random phenomena using probability and simulation, and statistical inference. Appropriate technology will be used. May not be used to fulfill degree requirements for mathematical sciences majors except those in the Master of Arts in Teaching (MAT) program. Recommended Prerequisite: A junior-level mathematics course. (3-0) T

[MTHE 5V06](#) Special Topics in Mathematics Education (1-3 semester credit hours) This course will cover selected topics in Mathematics Education. May be repeated for credit as topics vary (6 semester credit hours maximum). May not be used to fulfill degree requirements within the MS or PhD degrees in Mathematical Sciences. Instructor consent required. ([1-3]-0) R

[MTHE 5V09](#) Math Ed Independent Study (1-6 semester credit hours) Faculty-supervised independent study in Mathematics Education and Mathematics Education research. This course will cover selected topics in Mathematics Education. May be repeated for credit as topics vary (6 semester credit hours maximum). Instructor consent required. ([1-6]-0) Y