# Math Education

**MTHE 5321** Problems Using Algebra (3 semester 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. No credit allowed to mathematical sciences majors except those in M.A.T. program. Prerequisite: A junior-level mathematics course. (3-0) T

**MTHE 5322** Problems Using Geometry (3 semester 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. No credit allowed to mathematical sciences majors except those in M.A.T. program. Prerequisite: A junior-level mathematics course. (3-0) T

**MTHE 5323** Problems Using Pre-calculus (3 semester 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. No credit allowed to mathematical sciences majors except those in M.A.T. program. Prerequisite: A junior-level mathematics course. (3-0) T

**MTHE 5324** Problems Using Discrete Mathematics (3 semester 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. No credit allowed to mathematical sciences majors except those in M.A.T. program. Prerequisite: A junior-level mathematics course. (3-0) T

**MTHE 5325** Problems Using Mathematical Modeling (3 semester 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. No credit allowed to mathematical sciences majors except those in M.A.T. program. Prerequisite: A junior-level mathematics course. (3-0) T

**MTHE 5326** Problems Using Statistics and Probability (3 semester 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. No credit
allowed to mathematical sciences majors except those in M.A.T. program. Prerequisite: A junior-level mathematics course. (3-0) T

**MTHE 5327** Functions and Modeling (3 semester hours) Explorations and lab activities designed to strengthen and expand knowledge of topics taught in middle school mathematics using functions as a basis for real world application models in science, engineering and technology. Emphasis on models involving proportional reasoning. Analysis of relationships between analogous topics in middle school and high school/college mathematics. Approaches may include lecture, explorations, laboratory activities, technology use, and problem based learning. No credit allowed to mathematical sciences majors except those in M.A.T. program. (3-0) R

**MTHE 5v06** Special Topics in Mathematics Education (1-3 semester hours) (May be repeated for credit to a maximum of 9 hours) (May not be counted as credits toward the M.S. or Ph.D. degrees in Mathematical Sciences.) ([1-3]-0) R

**MTHE 5v09** Math Ed Independent Study (1-6 semester hours) Faculty-supervised independent study in mathematics education and mathematics education research. May be repeated for credit regardless of topics (12 hours maximum). ([1-6]-0) Y