MATH CONTENT KNOWLEDGE FOR ED (MCKE)

MCKE 5000 - Algebraic Patterns and Functions I (4 Credits)
Systematic study of the core elements of algebra: linear, quadratic, exponential, logarithmic functions and their graphs. Includes modeling using graphing calculators and real world applications. Concepts are linked to other scientific, mathematical, and pedagogical domains. This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: permission of project director. Max hours: 4 Credits.
Grading Basis: Letter Grade

MCKE 5004 - Statistics and Probability (3 Credits)
Studies the collection, presentation, and analysis of data; and elements and applications of counting discrete probability. Includes real world applications and technology. Concepts are linked to other scientific, mathematical, and pedagogical domains. This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: permission of project director. Max hours: 3 Credits.
Grading Basis: Letter Grade

MCKE 5005 - Geometry (4 Credits)
Systematic study of advanced geometric concepts: history of geometry and measurement, patterns among shapes, 2- and 3-dimensional shapes, constructions, symmetry or transformational geometry. Includes applications and activity-oriented instruction. Concepts are linked to other scientific, mathematical, and pedagogical domains. This course is not applicable toward any degree in the College of Liberal and Sciences. Prereq: permission of project director. Max hours: 4 Credits.
Grading Basis: Letter Grade

MCKE 5006 - Mathematics of Change (3 Credits)
Systematic study of the application of calculus to the analysis of changing systems in real world applications. Emphasizes the connections that exist between calculus and aspects of middle school curricula. Concepts are linked to other scientific, mathematical, and pedagogical domains. This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Note: this course assumes that students have completed MATH 5000 or equivalent. Prereq: Graduate standing. Max Hours: 3 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors

MCKE 5007 - Discrete Math--Counting the Possibilities (4 Credits)
Systematic study of basic techniques in discrete mathematics and their various applications: permutations and combinations, inclusion or exclusion, pigeonhole principle, graph theory, and recursive pattern solving. Applications to topics such as network analysis and voting theory are stressed. Concepts are linked to other scientific, mathematical, pedagogical domains. This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Note: this course assumes that students have completed MATH 5000 or equivalent. Prereq: Graduate standing. Max Hours: 4 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors

MCKE 5008 - Discovery and Use of the History of Math (4 Credits)
Systematic study of the people, events, ideas and issues from the history of mathematics, focusing on historical topics that are central to the discipline and teaching of mathematics and emphasizing web research of historical topics of interest. Concepts are linked to other scientific, mathematical, and pedagogical domains. Note: This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: permission of the project director. Max Hours: 4 Credits.
Grading Basis: Letter Grade

MCKE 5009 - Math Modeling--Using and Applying Math (4 Credits)
Systematic study of math modeling using algebra, geometry, discrete mathematics, rates of change, and statistics to solve real-world problems in areas such as finance, biology, economics, and physics. Concepts are linked to other scientific, mathematical, societal, and pedagogical domains. This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Note: this course assumes that students have completed MATH 5009 or equivalent. Prereq: Graduate standing. Max Hours: 4 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors

MCKE 5018 - Topics in Mathematics Education for Teachers (0.3-50 Credits)
Topics vary from semester to semester. Designed for professional mathematics teachers. This course will not count towards a degree in Applied Mathematics. Consent of the instructor required for enrollment. Repeatable. Max Hours: 50 Credits.
Grading Basis: Letter Grade
Repeatable. Max Credits: 50.

MCKE 5140 - Introduction to Modern Algebra (3 Credits)
Studies the fundamental algebraic structures used in modern mathematics. Topics include groups, rings, fields, and polynomials. Note: This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Note: this course assumes that students have completed MATH 3000 or equivalent. Prereq: Graduate standing. Cross-listed with MATH 4140. Term offered: spring. Max hours: 3 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors
Typically Offered: Spring.

MCKE 5210 - Higher Geometry I (3 Credits)
Studies the foundations of modern geometry by examining axiomatic systems for various geometrics, with an emphasis on non-Euclidean hyperbolic geometry. Note: This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Note: this course assumes that students have completed MATH 3000 or equivalent. Prereq: Graduate standing. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Cross-listed with MATH 3210. Max hours: 3 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors

MCKE 5310 - Introduction to Real Analysis I (3 Credits)
Calculus of one variable, the real number system, continuity, differentiation, integration theory, sequence and series. Note: This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Note: this course assumes that students have completed MATH 2421 and MATH 3000 or equivalent. Prereq: Graduate standing. Cross-listed with MATH 4310. Term offered: fall. Max hours: 3 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors
Typically Offered: Fall.

MCKE 5408 - Applied Graph Theory (3 Credits)
Introduces discrete structures and applications of graph theory to computer science, engineering, operations research, social science, and biology. Topics include connectivity, coloring, trees, Euler and Hamiltonian paths and circuits, matching and covering problems, shortest route and network flows. Note: This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Note: this course assumes that students have completed MATH 3000 or equivalent. Prereq: Graduate standing. Cross-listed with MATH 4408. Term offered: spring. Max hours: 3 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors
Typically Offered: Spring.

MCKE 5409 - Applied Combinatorics (3 Credits)
Major emphasis is on applied combinatorics and combinatorial algorithms, with applications in computer science and operations. Topics include general counting methods, generating functions, recurrence relations, inclusion-exclusion, and block designs. Note: This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Note: this course assumes that students have completed MATH 3000 or equivalent. Prereq: Graduate standing. Cross-listed with MATH 4409. Term offered: fall. Max hours: 3 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors
Typically Offered: Fall.

MCKE 5880 - Directed Research (1-6 Credits)
Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Note: Students must submit a special processing form completely filled out and signed by the student and faculty member, describing the course expectations, assignments and outcomes, to the CLAS Graduate Academic Services Coordinator for approval. Repeatable. Max Hours: 6 Credits.
Grading Basis: Letter Grade
Repeatable. Max Credits: 6.