MA - MATHEMATICS (MA)

MA 525. Methods and Materials for Teaching Secondary Mathematics. (3 Credits)
Practical aspects of teaching and learning mathematics at the secondary level. Topics covered include secondary mathematics curricula, preparation and presentation of lesson material, classroom management, and professional behaviors. Does not satisfy requirements for major field courses in mathematics. Prerequisite/corequisite: MA 421, College Geometry, or equivalent.

MA 545. Applied Statistics II. (3 Credits)
An advanced course in statistical methods and applications including statistical computing utilizing the Statistical Analysis System (SAS). Prerequisite: MA 345.

MA 547. Mathematical Statistics I. (3 Credits)
Probability and combinational methods, discrete probability functions; probability density functions for continuous variates; mathematical expectation; moment generating functions; appropriate applications. Prerequisite: MA 227.

MA 548. Mathematical Statistics II. (3 Credits)
Sampling distributions; confidence intervals; tests of hypothesis; regression analysis; analysis of variance; appropriate applications. Prerequisite: MA 447 or 547.

MA 552. Advanced Calculus. (3 Credits)
Functions of several variables; mapping; partial derivatives; power series; uniform convergence; line and surface integrals; vector analysis. Prerequisite: MA 451 or 551.

MA 555. Complex Analysis. (3 Credits)
Algebra and geometry of complex numbers; elementary functions and their mappings; analytic functions; integration in the complex plane; Cauchy's integral theorem; Taylor and Laurent expansions; calculus of residues. Prerequisite: MA 451 or 551.

MA 561. Numerical Analysis. (3 Credits)
Error analysis for iterative methods, approximation theory; numerical differentiation and quadrature; initial-value problems for ordinary differential equations; iterative techniques in matrix algebra. Also listed as CS 561 but creditable only in the field for which registered. Prerequisites: CS 155 or 210; MA 227.

MA 571. Applied Mathematics. (3 Credits)
Mathematical model and modeling techniques in the field of engineering, ecology, economics, medicine, chemistry, traffic engineering, and simulation of experiments. Prerequisite: MA 227.

MA 575. Intro to Operations Research. (3 Credits)
The nature of operations research; modeling problems using operations research techniques; linear programming; the Simplex Method, theory and practice, special problems; network analysis; dynamic programming; theory of games. Prerequisites: MA 126 and one of CS 110, 155, 210. Corequisite: MA 431.

MA 591. Graduate Seminar. (3 Credits)
Mathematics topics selected according to the interest and needs of the individual student, with study at the graduate level. Prerequisites: graduate classification and approval of the chair of the department.

MA 601. Fundamental Concepts in Mathematics for the Elementary School Teacher. (3 Credits)
Mathematics as a language and a tool for thinking. Emphasis is placed on teaching with meaning and on seeing arithmetic as a unified system of correlated ideas, facts, and principles. Includes fundamental notions of number, measure, logic, proof, and function.

MA 611. Applied Mathematics for the Teacher. (3 Credits)
Process approach to problem solving. Emphasis placed on fundamental steps in the solution of problems.

MA 612. Selected Topics in Mathematics for the Teacher. (3 Credits)
Selected topics suitable for laboratory mathematics; mathematics modeling; secondary school mathematics from an advanced point of view.

MA 617. Symbolic Logic. (3 Credits)
Concept of a logistic system and the propositional calculus. Truthtables and their applications to problems. Syllogistic inference and rules. Class membership and inclusion, the algebra of classes.

MA 621. Foundations in Algebra for the Teacher. (3 Credits)
Elementary number theory. Groups, fields, systems of linear equations and transformations. Vector algebra.

MA 623. Foundations in Analysis for the Teacher. (3 Credits)
Development of the real number system, limits and continuity, and basic point set theory.

MA 625. Foundations in Geometry for the Teacher. (3 Credits)
Development of Euclidean geometry in two and three dimensions using the axiomatic methods. Introduction to non-Euclidean geometries.

MA 630. Topics in Advanced Mathematics. (3 Credits)
Proof-writing techniques; logic; sets and functions; fundamental topics in analysis, abstract and linear algebra, number theory, and combinatorics.

MA 634. History of Philosophy of Mathematics. (3 Credits)
Development of mathematics in algebra, geometry, an analysis Impact of science and philosophy made by Euclid, Descartes, Newton, Euler, Gauss, Wierstrass, Cantor, Hamilton, Boole, and Galois.

MA 637. Rings and Fields. (3 Credits)
Introduction to groups; subgroups; group homomorphisms; quotient groups; direct products; semidirect products; group actions; and the Sylow theorems.

MA 638. Rings and Fields. (3 Credits)
Theory of rings; integral domains; fields; Galois theory. Prerequisite: MA 637 with a grade of C or higher.

MA 651. Advanced Calculus. (3 Credits)
Logic; basic set theory and topology; real number system; limits; functions; continuity; sequences and series.

MA 652. Advanced Calculus II. (3 Credits)
Derivatives; sequences and series of functions; convergence; power series; Riemann-Stieltjes integral; Fourier series. Prerequisite: MA 651 with a grade of C or higher.

MA 661. Numerical Analysis. (3 Credits)
Error analysis for iterative methods, approximation theory; numerical differentiation and quadrature; initial-value problems for ordinary differential equations; iterative techniques in matrix algebra. Also listed as CS 561 but creditable only in the field for which registered. Prerequisites: CS 155 or 210; MA 227.

MA 691. Graduate Seminar. (3 Credits)
Mathematics topics selected according to the interest and needs of the individual student, with study at the graduate level. Prerequisites: graduate classification and approval of the chair of the department.