

MATHEMATICS (MTH)

MTH 500 Structure of Algebra **3 Credit hours**

Emphasis on the language of Modern Elementary Algebra. Recommended for preservice elementary teachers and for elementary and secondary in-service teachers. May not be used for a degree offered by the Department of Mathematics or in the twelve hour content block of the Secondary Education MA Degree program for students with mathematics certification in grades 7-12.

Grade Mode: Normal Grading Mode

MTH 501 Structure Modern Geometry **3 Credit hours**

Informal development of geometry. Recommended for preservice elementary teachers and for elementary and secondary in-service teachers. May not be used for a degree offered by the Department of Mathematics or in the twelve hour content block of the Secondary Education MA Degree program for students with mathematics certification in grades 7-12.

Grade Mode: Normal Grading Mode

MTH 527 Advanced Calculus I **3 Credit hours**

The number system, limits, sequences, partial differentiation with applications, maxima and minima of functions of several variables. Theory of definite integrals, multiple integrals, line and surface integrals, improper integrals, infinite series.

Grade Mode: Normal Grading Mode

MTH 528 Advanced Calculus II **3 Credit hours**

The number system, limits, sequences, partial differentiation with applications, maxima and minima of functions of several variables. Theory of definite integrals, multiple integrals, line and surface integrals, infinite series.

Pre-req: MTH 527 with a minimum grade of C.

Grade Mode: Normal Grading Mode

MTH 548 Modern Geometries **3 Credit hours**

Finite geometries, basic background material for the modern development of Euclidean Geometry, other geometries.

Grade Mode: Normal Grading Mode

MTH 549 Projective Geometry **3 Credit hours**

Projective geometry using both synthetic and algebraic methods.

Attributes: No Textbook Required

Grade Mode: Normal Grading Mode

MTH 550 Modern Algebra I **3 Credit hours**

Structure of the abstract mathematical systems; groups, rings, fields, with illustrations and applications from Number Theory.

Grade Mode: Normal Grading Mode

MTH 552 Modern Algebra II **3 Credit hours**

Structure of the abstract mathematical systems; groups, rings, fields, with illustrations and application from Number Theory.

Pre-req: MTH 550 with a minimum grade of C.

Grade Mode: Normal Grading Mode

MTH 580 Special Topics **1-4 Credit hours**

Courses on special topics not listed among the current course offerings.

Attributes: No Textbook Required

Grade Mode: Normal Grading Mode

MTH 585 Independent Study **1-4 Credit hours**

Attributes: No Textbook Required

Grade Mode: Normal Grading Mode

MTH 589 Graduate Mathematics Seminar **1 Credit hour**

A seminar on topics relevant to graduate students in mathematics, including college-level teaching, conducting research, professional ethics, and mathematics careers. This course does not satisfy any degree requirements.

Attributes: No Textbook Required

Grade Mode: Credit/No Credit Grade Only

MTH 615 Partial Differential Equations **3 Credit hours**

Elementary partial differential equations. Heat equation, Laplace's equation, separation of variables, Fourier series, vibrating strings, eigenvalue problems, finite differences, Bessel functions, Legendre polynomials.

Grade Mode: Normal Grading Mode

MTH 616 Advanced Differential Equations **3 Credit hours**

Differential equations are studied qualitatively. Topics include the existence and uniqueness of solutions and the behavior of solutions including the stability of nonlinear systems, periodic solutions, and approximation using perturbation methods.

Grade Mode: Normal Grading Mode

MTH 630 Topology I **3 Credit hours**

General topology including separation axioms, connectedness, compactness, convergence, continuity, metric spaces, product and quotient spaces.

Grade Mode: Normal Grading Mode

MTH 631 Topology II **3 Credit hours**

General topology including separation axioms, connectedness, compactness, convergence, continuity, metric spaces, product and quotient spaces.

Pre-req: MTH 630 with a minimum grade of C and MTH 550 with a minimum grade of C.

Grade Mode: Normal Grading Mode

MTH 635 Graph Theory and Combinatorics **3 Credit hours**

The course is designed to introduce students in mathematical sciences to the theorems, techniques and applications of graph theory and combinatorics.

Grade Mode: Normal Grading Mode

MTH 640 Complex Variables I **3 Credit hours**

A study of algebra, topology, and geometry of the complex plane; holomorphic functions; conformal mapping; analytic functions and analytic continuation; complex integration; representation theorems; convergence theorems and related topics.

Attributes: No Textbook Required

Grade Mode: Normal Grading Mode

MTH 642 Numerical Linear Algebra **3 Credit hours**

Direct and iterative methods for numerical solution of linear systems of equations. Eigenvalues and eigenvectors. Error analysis and norms. Related Topics.

Attributes: No Textbook Required

Grade Mode: Normal Grading Mode

MTH 643 Numerical Analysis **3 Credit hours**

The theory and technique of numerical computation involving the difference calculus, the summation calculus, interpolation methods, solutions of equations, and methods of solution of ordinary differential equations.

Grade Mode: Normal Grading Mode

MTH 650 Real Variables I **3 Credit hours**

A study of measure and integration and related topics.

Pre-req: MTH 528 with a minimum grade of C.

Grade Mode: Normal Grading Mode

MTH 655 Number Theory **3 Credit hours**

A survey of some basic properties of the integers: divisibility (prime numbers, factorization, perfect numbers), congruences (modular arithmetic, linear and quadratic congruences, the Chinese Remainder Theorem), and Diophantine equations.

Grade Mode: Normal Grading Mode

MTH 667 Num Partial Diff Equations **3 Credit hours**

Finite difference methods for elliptic, parabolic, and hyperbolic PDEs.

Study of properties such as consistency, convergence, and stability.

Computer implementation.

Pre-req: MTH 527 with a minimum grade of C.

Grade Mode: Normal Grading Mode

MTH 670 Independent Study **1-4 Credit hours**

An independent program of study of advanced topics not normally covered in other courses. The topics are chosen upon mutual agreement between the student and the instructor

Attributes: No Textbook Required

Grade Mode: Normal Grading Mode

MTH 681 Thesis **1-6 Credit hours**

Attributes: No Textbook Required, Thesis

Grade Mode: Normal Grading Mode

MTH 690 Special Topics **1-4 Credit hours**

Courses on special topics not listed among the current course offerings. (PR: Permission of Instructor)

Grade Mode: Normal Grading Mode