MATHEMATICS (MAT)

MAT500. Combinatorics and Graph Theory. 3 Credits.

Combinatorial and graphical techniques for complexity analysis, generating functions, recurrence relations, Polya's Theory of Counting, graph theory, NP-complete problems.

Restrictions:

- Must have the following level: Graduate

May not be repeated for credit

MAT510. Geometry for Elementary and Middle School Teachers. 3 Credits.

This course provides a geometric experience which clarifies, extends, and unifies geometric topics in Euclidean, analytic, transformational, and projective geometries. This course is open only to students doing graduate course work in elementary or middle school education in the School of Education.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Graduate
- Must not be enrolled in the following field(s) of study (major, minor or concentration):
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  - Adolescence Ed: Mathematics (037A)
  - Adolescence Ed: Mathematics (107A)
  - Mathematics (206)

May not be repeated for credit

MAT511. Theory of Groups. 3 Credits.

First course in algebraic structures. Basic set theory and number theory. Axioms of groups. Homomorphisms, isomorphisms, and quotient groups. For MS in Education degree students only. Not open to undergraduates. Students must complete 21 credits beyond Calculus 2 with a C- or better before taking this course.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Graduate
- Must not be enrolled in the following field(s) of study (major, minor or concentration): Mathematics (206)

Prerequisites:

- MAT252 Minimum Grade of D-

May not be repeated for credit

MAT512. Real and Complex Number Systems. 3 Credits.

Survey and development of number systems from the natural numbers to the complex numbers. Basic theory and properties. Applications to high school mathematics. For MS in Education degree students only. Not open to undergraduates. Students must complete 21 credits beyond Calculus 2 with a C- or better before taking this course.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Graduate
- Must not be enrolled in the following field(s) of study (major, minor or concentration): Mathematics (206)

May not be repeated for credit

MAT513. The Joys of Geometry. 3 Credits.

Topics in modern geometry such as finite geometries, transformations, non-Euclidean and projective geometries, Mascheroni constructions. Axiomatic approach is often used. Proofs constitute an important part of the course. For MS in Education degree students only. Not open to undergraduates.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Graduate
- Must be enrolled in the following field(s) of study (major, minor or concentration):
-
  - Adolescence Ed: Mathematics (037A)
  - Adolescence Ed:Mathematics (037B)
  - Math
  - Science
  - Technology: 1-6 (013M)

May not be repeated for credit

MAT514. Linear Algebra with Applications to Geometry. 3 Credits.

Matrices, linear transformations, and quadratic forms. Solutions of linear systems. Applications to analytic geometry of 2, 3, or n dimensions. For MS in Education degree students only. Not open to undergraduates. Students must complete 21 credits beyond Calculus 2 with a C- or better before taking this course.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Graduate
- Must not be enrolled in the following field(s) of study (major, minor or concentration): Mathematics (206)

May not be repeated for credit

MAT517. History of Mathematics. 3 Credits.

Topics in mathematics from a historical perspective. The course may be a survey of the history of mathematics or it may concentrate on a few specific topics. In either case, students are required to solve problems and to prove theorems. Recommended for MS in Education degree students. Students must complete 21 credits beyond Calculus 2 with a C- or better before taking this course.

Restrictions:

- Must have the following level: Graduate
- Must not be enrolled in the following field(s) of study (major, minor or concentration): Mathematics (206)

May not be repeated for credit

MAT518. Theory of Rings and Fields. 3 Credits.

Rings, Fields and their extensions. Introduction to Galois Theory. Solutions of equations by radicals. For MS in Education degree students only. Not open to undergraduates.

Restrictions:

- Must have the following level: Graduate

Prerequisites:

- MAT511 Minimum Grade of C-

May not be repeated for credit

MAT519. Sequences, Series, and Their Applications. 3 Credits.

Sequences of real and complex numbers. Convergence criteria, series, uniform convergence, definition of functions by series and Taylor's theorem. For MS in Education degree students only. Not open to undergraduates. Students must complete 21 credits beyond Calculus 2 with a C- or better before taking this course.

Restrictions:

- Must have the following level: Graduate
- Must not be enrolled in the following field(s) of study (major, minor or concentration): Mathematics (206)

May not be repeated for credit

MAT520. Statistics for Elementary/Middle School Teachers. 3 Credits.

Liberal arts course in basic statistical ideas and their application to public policy and education. Emphasis on statistical reasoning and numerical arguments. Focus on drawing conclusions from data taken from diverse settings and contexts.

Restrictions:

- Must have the following level: Graduate
- Must not be enrolled in the following field(s) of study (major, minor or concentration):
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  - Adolescence Ed: Mathematics (037A)
  - Adolescence Ed: Mathematics (107A)
  - Mathematics (206)

May not be repeated for credit

MAT531. Point Set Topology I. 3 Credits.

Part of a two-semester sequence covering the fundamental theorems of geometric topology in abstract topological and metric spaces.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Graduate

May not be repeated for credit

MAT532. Point Set Topology II. 3 Credits.

Part of a two-semester sequence covering the fundamental theorems of geometric topology in abstract topological and metric spaces.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Graduate

May not be repeated for credit

MAT541. Complex Analysis I. 3 Credits.

Provides a foundation for advanced work in analysis. Differentiation, Cauchy-Riemann Equations, elementary functions, conformal mapping, expansions, and analytic continuation.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Graduate

May not be repeated for credit

MAT543. Real Analysis I. 3 Credits.

Part of a two-semester sequence covering the following topics:
The real number system, topology of Rn, measure theory, and the Lebesque integral. Convergence theorems, differentiation, and Lebesque decompositions. Fubini's theorem, Radon-Nikodym theorem, and other advanced topics.

Restrictions:

- Must have the following level: Graduate

May not be repeated for credit

MAT544. Real Analysis II. 3 Credits.

Part of a two-semester sequence covering the following topics:
The real number system, topology of Rn, measure theory, and the Lebesque integral. Convergence theorems, differentiation, and Lebesque decompositions. Fubini's theorem, Radon-Nikodym theorem, and other advanced topics.

Restrictions:

- Must have the following level: Graduate

Prerequisites:

- MAT543 Minimum Grade of C-

May not be repeated for credit

MAT561. Abstract Algebra I. 3 Credits.

Part of a two-semester sequence covering the following topics: Groups, rings, integral domains, fields, modules, and vector spaces.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Graduate

May not be repeated for credit

MAT562. Abstract Algebra II. 3 Credits.

Part of a two-semester sequence covering the following topics: Groups, rings, integral domains, fields, modules, and vector spaces.

Restrictions:

- Must have the following level: Graduate

Prerequisites:

- MAT561 Minimum Grade of C-

May not be repeated for credit

MAT563. Topics in Algebra I. 3 Credits.

Topics chosen by the instructor, may include structure theory of Abelian groups, commutative rings and finite fields, lattice theory, universal algebra. Students must complete 21 credits beyond Calculus 2 with a C- or better before taking this course.

Restrictions:

- Must have the following level: Graduate

May not be repeated for credit

MAT590. Thesis in Mathematics. 1-12 Credits.

Writing and preparation of an expository or original thesis under the guidance of graduate faculty. Required form available in the Records and Registration Office.

Restrictions:

- Must have the following level: Graduate

May not be repeated for credit

MAT593. Math Selected Topic. 1-12 Credits.

Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.

Restrictions:

- Must have the following level: Graduate

May be repeated for credit

MAT594. Fieldwork in Math. 0 Credits.

Restrictions:

- Must have the following level: Graduate

May not be repeated for credit

MAT595. Indep Study Math. 1-3 Credits.

Restrictions:

- Must have the following level: Graduate

May be repeated for credit

MAT599. Comprehensive Exam Workshop. 0 Credits.

Non-credit workshop for students who wish to devote the semester immediately following the completion of their coursework to prepare for the comprehensive exam.

Restrictions:

- Must have the following level: Graduate
- Must be enrolled in the following field(s) of study (major, minor or concentration): Mathematics (206)

May not be repeated for credit

MAT795. Indep Study Math. 1-6 Credits.

Restrictions:

- Must have the following level: Graduate

May be repeated for credit

MAT799. Continued Registration. 1 Credit.

Restrictions:

- Must have the following level: Graduate

May be repeated for credit