MATH 1101. Math Developmental Education Intervention. 
Developmental education interventions are available to students who have been determined to benefit from short, innovative, research-based approaches for learning mathematics. Students will be assessed using college readiness indicators or other information to determine individualized approaches. This is a non-credit, non-course, non-semester-length based developmental education program that is designed to provide students with just-in-time knowledge and skills for college level courses. Co-Requisite: MATH 1315. Prerequisite: Departmental Approval.

about Math Developmental Education Intervention

1 Credit Hour. 0 Lecture Contact Hours. 24 Lab Contact Hours.
Course Attribute(s): Developmental/Remedial
Grade Mode: Developmental
about Math Developmental Education Intervention

MATH 1300. Elementary Algebra. 
A course to remediate and review basic academic skills in mathematics, including number concepts, computation, elementary algebra, geometry and mathematical reasoning. MATH 1300 will not constitute a part of the hours required for a bachelor's degree.

about Elementary Algebra

3 Credit Hours. 1 Lecture Contact Hour. 3 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing/Developmental/Remedial/Lab Required
Grade Mode: Developmental
about Elementary Algebra

MATH 1311. Intermediate Algebra. 
A preparatory course for college algebra. Topics include linear equations and inequalities, rational expressions, exponents and radicals, quadratics and word problems. This course is designed for students who have graduated from high school with no more than the minimum mathematics requirements or for students who have been away from mathematics for a number of years. Prerequisite: MATH 1300 with a grade of CR, ACT Mathematics score of 15 or more, SAT Mathematics score of 400 or more, Accuplacer College Mathematics score of 40 or more, or Compass Algebra score of 35 or more.

about Intermediate Algebra

3 Credit Hours. 1 Lecture Contact Hour. 3 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing/Developmental/Remedial/Lab Required
Grade Mode: Developmental
about Intermediate Algebra

MATH 1312. College Statistics and Algebra. 
A course covering linear and quadratic equations, inequalities, functions and their graphs, logarithms, systems of equations, and applications of mathematics. Special emphasis on statistical concepts including linear and quadratic regression, distributions confidence intervals, & hypothesis testing. This course is not intended to substitute for MATH 1315 as a prerequisite. Prerequisite: College Readiness in Mathematics according to the TSI regulations.

about College Statistics and Algebra

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Mathematics Core
Grade Mode: Standard Letter
TCCN: MATH 1324
about College Statistics and Algebra

MATH 1315. College Algebra. 
A course covering linear and quadratic equations, inequalities, word problems, functions, logarithms, systems of equations and other college algebra topics as time permits. Prerequisite: College Readiness in Mathematics according to the TSI regulations.

about College Algebra

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Mathematics Core
Grade Mode: Standard Letter
TCCN: MATH 1314
about College Algebra

MATH 1316. Survey of Contemporary Mathematics. 
(MATH 1332) A study of the uses of mathematics in society today. Emphasis is on concepts rather than technical details. May not be used as a prerequisite for any other mathematics course. Prerequisite: College Readiness in Mathematics according to TSI regulations. about Survey of Contemporary Mathematics

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Mathematics Core
Grade Mode: Standard Letter
TCCN: MATH 1332
about Survey of Contemporary Mathematics

MATH 1317. Plane Trigonometry. 
A course covering trigonometric functions, right triangles, radian measure, graphs of trigonometric functions, trigonometric identities, including multiple and half-angle identities, inverse trigonometric functions, trigonometric equations, oblique triangles, and complex numbers. Prerequisite: MATH 1315 with a grade of C or higher, Accuplacer College Mathematics score of 86 or more, or Compass College Algebra score of 46 or more.

about Plane Trigonometry

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Mathematics Core
Grade Mode: Standard Letter
TCCN: MATH 1316
about Plane Trigonometry

MATH 1319. Mathematics for Business and Economics I. 
Topics from college algebra and finite mathematics which apply to business and economics including applications of equations and inequalities, simple and compound interest and annuities. Prerequisite: College Readiness in Mathematics according to the TSI regulations. about Mathematics for Business and Economics I

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Mathematics Core
Grade Mode: Standard Letter
TCCN: MATH 1324
about Mathematics for Business and Economics I
MATH 1329. Mathematics for Business and Economics II.  
Topics from finite mathematics and elementary differential calculus which apply to business and economics. Prerequisite: MATH 1315 or 1319 with a grade of C or higher, ACT Mathematics score of 27 or more, SAT Mathematics score of 580 or more, Accuplacer College Mathematics score of 86 or more, or Compass College Algebra score of 46 or more.  
about Mathematics for Business and Economics II 
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Mathematics Core 
Grade Mode: Standard Letter 
TCCN: MATH 1329 

MATH 2313. Pre-Calculus Mathematics.  
A survey of functions, trigonometry and analytic geometry to prepare students for calculus. Prerequisite: MATH 1315 with a grade of C or higher, ACT Mathematics score of 27 or more, SAT Mathematics score of 580 or more, Accuplacer College Mathematics score of 103 or more, Compass Trigonometry score of 46 or more.  
about Pre-Calculus Mathematics 
4 Credit Hours. 2 Lecture Contact Hours. 3 Lab Contact Hours. 
Course Attribute(s): Mathematics CoreLab Required 
Grade Mode: Standard Letter 
TCCN: MATH 2313 

MATH 2321. Calculus for Life Sciences I.  
This course is designed to serve the needs of students in the life sciences. Topics will include: graphs, derivatives, exponents and logarithms, scientific notation, sequences, summation, and applications. Prerequisite: MATH 1315 with a grade of C or higher, ACT Mathematics score of 24 or more, SAT Mathematics score 520 or more, Accuplacer College Mathematics score of 86 or more, or Compass College Algebra score of 46 or more.  
about Calculus for Life Sciences I 
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours. 
Course Attribute(s): Mathematics Core 
Grade Mode: Standard Letter 
TCCN: MATH 2321 

MATH 2328. Elementary Statistics.  
This course is an algebra-based introduction to descriptive statistics, random sampling, design of experiments, probability and the Central Limit Theorem. Inferential statistics topics include the foundational concepts for confidence intervals and hypothesis testing for simple experiments. Prerequisites: MATH 1315 with a grade of "C" or higher, MATH 2321 with a grade of "D" or higher, MATH 2417 with a grade of "D" or higher, MATH 2471 with a grade of "D" or higher, ACT Mathematics score of 24 or more or SAT Mathematics score of 520 or more.  
about Elementary Statistics 
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours. 
Grade Mode: Standard Letter 
TCCN: MATH 2328 

MATH 2417. Pre-Calculus Mathematics.  
A survey of functions, trigonometry and analytic geometry to prepare students for calculus. Prerequisite: MATH 1315 with a grade of C or higher, ACT Mathematics score of 27 or more, SAT Mathematics score of 580 or more, Accuplacer College Mathematics score of 103 or more, Compass Trigonometry score of 46 or more.  
about Pre-Calculus Mathematics 
4 Credit Hours. 2 Lecture Contact Hours. 3 Lab Contact Hours. 
Course Attribute(s): Mathematics CoreLab Required 
Grade Mode: Standard Letter 
TCCN: MATH 2417 

MATH 2421. Calculus I.  
This is the first course in differential and integral calculus which stresses limits as well as the applications of calculus to the problems of science. Prerequisites: MATH 2417 with a grade of C or higher, ACT Mathematics score of 27 or more, SAT Mathematics score of 580 or more, Accuplacer College Mathematics score of 103 or more, Compass Trigonometry score of 46 or more.  
about Calculus I 
4 Credit Hours. 2 Lecture Contact Hours. 3 Lab Contact Hours. 
Course Attribute(s): Mathematics CoreLab Required 
Grade Mode: Standard Letter 
TCCN: MATH 2421 

MATH 2471. Calculus II.  
This course is the second course in differential and integral calculus which stresses limits as well as the applications of calculus to the problems of science. Prerequisites: MATH 2417 with a grade of C or higher, ACT Mathematics score of 27 or more, SAT Mathematics score of 580 or more, Accuplacer College Mathematics score of 103 or more, Compass Trigonometry score of 46 or more.  
about Calculus II 
4 Credit Hours. 2 Lecture Contact Hours. 3 Lab Contact Hours. 
Course Attribute(s): Mathematics CoreLab Required 
Grade Mode: Standard Letter 
TCCN: MATH 2471
MATH 2472. Calculus II.
A continuation of differential and integral calculus including methods of integration, sequences and series, and introduction to partial derivatives. Prerequisite: MATH 2471 with a grade of "C" or higher.

4 Credit Hours. 2 Lecture Contact Hours. 3 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter
TCCN: MATH 2414
about Calculus II

MATH 3305. Introduction to Probability and Statistics.
Basic probability models, generating functions and conditional probability, also discrete and continuous, univariate and bivariate distributions of random variables. Concepts of estimation, tests of hypothesis and statistical inference. Prerequisite: MATH 2472 with a grade of "C" or higher.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Introduction to Probability and Statistics

MATH 3315. Modern Geometry.
Modern geometry with an emphasis on the triangle, circle, plane and Euclidian geometry, an historical aspects will be integrated into the course. May not be applied toward a minor in mathematics. Prerequisites: MATH 2321 or MATH 2471 with a grade of "C" or higher.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Modern Geometry

MATH 3323. Differential Equations.
A course covering solutions to the more common types of ordinary differential equations, especially those of first and second order, with emphasis on geometrical and physical interpretations. Prerequisite: MATH 2472 with a grade of "C" or higher.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Differential Equations

MATH 3325. Number Systems.
Algebraic construction of the natural numbers. Covers the basic vocabulary and proof techniques of abstract algebra, and the structural properties of the natural numbers, integers, rational, real and complex number systems. Prerequisite or Co-requisite: MATH 2471.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Number Systems

MATH 3330. Introduction to Advanced Mathematics.
An introduction to the theory of sets, relations, functions, finite and infinite sets, and other selected topics. Algebraic structure and topological properties of Euclidean Space, and an introduction to metric spaces. Prerequisite: MATH2472 with a grade of "C" or higher.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Introduction to Advanced Mathematics

MATH 3348. Determinisitic Operations Research.
This course provides a broad overview of deterministic operations research techniques. Linear programming will be covered including the simplex method, duality and sensitivity analysis. Further selected topics are from integer programming, dynamic programming, scheduling models, game theory, and associated topics. Prerequisite: MATH 2472 with a grade of C or higher.

about Deterministic Operations Research

MATH 3372. Calculus III.
A course covering sequences and series, vectors, functions of several variables, partial derivatives, multiple integrals, line and surface integrals, and applications. Prerequisite: MATH 2472 with a grade of "C" or higher.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Calculus III

A course covering statics, using a vector approach to mechanics. The course is designed to satisfy the requirements of engineering Colleges. Prerequisite: PHYS 1430. Prerequisite or Co-requisite: MATH 2472.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Engineering Mechanics

MATH 3398. Linear Algebra.
An introductory course in linear algebra covering vector spaces, linear transformation, matrices, systems of linear equations, and inner product spaces. Prerequisite: MATH 2472 with a grade of "C" or higher.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Linear Algebra

MATH 3399. Analysis I.
A course covering the introduction to the theory of real functions. Topics include limits, continuity and derivatives and associated topics. Prerequisite: MATH 3330 with a grade of "C" or higher.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Analysis I

MATH 3383. Numerical Analysis I.
This course focuses on basic numerical methods in mathematics to the solution of functional problems in fields such as engineering and applied sciences. This course covers instructions in computer arithmetic, solutions of equations, interpolation, numerical differentiation/integration, and applications to scientific and industrial applications. Prerequisite: MATH 2472 with grade of "C" or higher.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Numerical Analysis I
MATH 3398. Discrete Mathematics II.
A continuation of discrete Mathematics I. Prerequisite: MATH 2358 with a grade of "C" or higher.
about Discrete Mathematics II
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Discrete Mathematics II

MATH 4302. Principles of Mathematics II.
Algebraic reasoning and probability with selected topics from quantitative reasoning, measurement, statistics, and geometry are integrated with middle school pedagogical practices such as inquiry learning and use of technology. Appropriate correlated lessons, writing components, and culturally responsive teaching are incorporated.
Prerequisite: MATH 2312 with a grade of "C" or higher.
about Principles of Mathematics II
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Writing Intensive
Grade Mode: Standard Letter
about Principles of Mathematics II

MATH 4303. Capstone Mathematics for Middle School Teachers.
A rigorous, integrated, analytical perspective of mathematical topics; quantitative reasoning, geometry and measurement, probability and statistics, number theory and algebraic reasoning. May not be applied towards a mathematics minor. Must be taken before student teaching.
Prerequisites: Math 2331 or 2472 and Math 3315 with grades of "C" or higher.
about Capstone Mathematics for Middle School Teachers
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Capstone Mathematics for Middle School Teachers

Basic concepts underlying algebra, geometry, trigonometry, and calculus taught from an advanced standpoint, including historical, philosophical, and cultural significance. May not be applied toward a minor in mathematics. Must be taken before student teaching.
Prerequisite: MATH 3315 and MATH 2331 or MATH 2472 with grades of "C" or higher.
about Capstone Mathematics for Secondary Teachers (of Mathematics)
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Capstone Mathematics for Secondary Teachers (of Mathematics)

MATH 4305. Probability and Statistics.
A course covering sample spaces, probability of events, binomial and multinomial distributions, random variables, normal approximations, statistical inference, and applications. Prerequisite: MATH 3305 with a grade of "C" or higher.
about Probability and Statistics
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Probability and Statistics

MATH 4306. Fourier Series and Boundary Value Problems.
Advanced solution methods for differential equations; partial differential equations; series approximations, Fourier series; boundary value problems typical of scientific applications. Prerequisite: MATH 3323 with a grade of "C" or higher.
about Fourier Series and Boundary Value Problems
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Fourier Series and Boundary Value Problems

MATH 4307. Modern Algebra.
A course covering elementary set theory, structures, functions, and concepts of modern algebra. Prerequisites: MATH 3330 with a grade of "C" or higher and MATH 3325 or 3377 with a grade of "C" or higher.
about Modern Algebra
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Modern Algebra

MATH 4311. Introduction to the History of Mathematics.
A survey of the development of major mathematical topics, including geometry, algebra, calculus, and advanced mathematics. Philosophical and cultural aspects will be integrated with the structure, theorems, and applications of mathematics. May not be applied toward a minor in mathematics. Prerequisite: MATH 3315 with a grade of "C" or higher and MATH 2331 or MATH 2472 with a grade of "C" or higher. (WI).
about Introduction to the History of Mathematics
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Writing Intensive
Grade Mode: Standard Letter
about Introduction to the History of Mathematics

MATH 4315. Analysis II.
A continuation of MATH 3380. Topics include integration, series and sequences of functions and associated topics. Prerequisite: MATH 3380 with a grade of "C" or higher.
about Analysis II
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Analysis II

MATH 4330. General Topology.
Topics include introductory treatment of convergence, continuity, compactness, connectedness and fixed points in topological spaces with special emphasis on metric spaces. Prerequisite: MATH 3330 or MATH 3380 with a grade of "C" or higher.
about General Topology
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about General Topology

Selected topics including Laplace transforms, complex variables, advanced calculus for applications, calculus of variations, integral equations, intermediate differential equations, vector analysis, etc. May be repeated once for credit with a different topic. Prerequisite: Consent of instructor.
about Studies in Applied Mathematics
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Standard Letter
about Studies in Applied Mathematics
MATH 4350. Introduction to Combinatorics.
This course introduces fundamental concepts and results in combinatorics such as counting techniques, binomial coefficients, and recurrence relations; and applications in different fields such as complexity of algorithms and graph theory. Mathematical proofs are an essential part of this course. Prerequisite: MATH 2472 with a grade of "C" or higher.
about Introduction to Combinatorics
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

MATH 4382. The Literature and Modern History of Mathematics and Its Applications.
This course will focus on mathematical articles in recent journals. The articles will be re-written so that the proofs and comments are more easily understood by the casual reader. This embellishment of journal articles will take place in class with the class participating, in groups for outside work and as individual assignments. May not be applied toward a minor in mathematics. Prerequisites: A grade of "C" or higher in two of these three: MATH 3380, MATH 4307, or MATH 4330. (WI).
about The Literature and Modern History of Mathematics and Its Applications
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Writing Intensive
Grade Mode: Standard Letter

MATH 4383. Numerical Analysis II.
This course focuses on a broad range of mathematical and computational methods in modeling, analysis, and simulation of scientific and engineering problems. This course covers instructions in numerical analysis, approximation, optimization, differential equations, scientific computation, and applications to scientific and industrial topics. Prerequisites: MATH 3383 and MATH 3323 with grades of "C" or higher.
about Numerical Analysis II
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

MATH 5111. Graduate Assistant Training.
This course is concerned with techniques used in the teaching of mathematics. This course is required as a condition of employment for graduate teaching and instructional assistants. This course does not earn graduate degree credit. Repeatable with different emphasis. Graded on a credit (CR), no-credit (F) basis.
about Graduate Assistant Training
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Course Attribute(s): Graduate Assistantship|Exclude from Graduate GPA
Grade Mode: Leveling/Assistantships

MATH 5199B. Thesis.
This course represents a student’s continuing thesis enrollment. The student continues to enroll in this course until the thesis is submitted for binding. Graded on a credit (CR), progress (PR), no-credit (F) basis.
about Thesis
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

MATH 5299B. Thesis.
This course represents a student’s continuing thesis enrollment. The student continues to enroll in this course until the thesis is submitted for binding. Graded on a credit (CR), progress (PR), no-credit (F) basis.
about Thesis
2 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

MATH 5301. Partial Differential Equations.
Theory and application of partial differential equations; derivation of the differential equation; use of vector and Tensor methods; equations of the first order; wave equations; vibrations and normal functions; Fourier series and integral; Cauchy's methods, initial data; methods of Green; potentials; boundary problems; methods of Riemann-Volterra; characteristics. Prerequisites: MATH 3323 and consent of the instructor.
about Partial Differential Equations
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

MATH 5303. History of Mathematics.
A study of the development of mathematics and of the accomplishments of men and women who contributed to its progress. Cannot be used on a degree plan for M.S. degree. Prerequisite: A grade of at least C in MATH 2472.
about History of Mathematics
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

MATH 5304. Topics in Mathematics for the Secondary Teacher.
A study of the current trends and topics found in the secondary school mathematics curriculum with the goal of improving the mathematical background of the secondary teacher. Course content will be flexible and topics will be selected on the basis of student needs and interests. Cannot be used on degree plan for M.S. degree. Prerequisite: A grade of C in MATH 2472.
about Topics in Mathematics for the Secondary Teacher
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

MATH 5305. Advanced Course in Probability and Statistics.
Advanced topics in probability and statistics. May be repeated once with different emphasis for additional credit. Prerequisite: MATH 3305.
about Advanced Course in Probability and Statistics
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

MATH 5306. Ring Theory.
Prerequisite: A grade of at least a "C" in MATH 4307 or a grade of at least a "B" in MATH 5384.
about Ring Theory
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
MATH 5307. Modern Algebra.
Topics in modern algebra. Material will be adapted to the needs of the class. Prerequisite: A grade of at least a C in MATH 4307 or a grade of at least a B in MATH 5384.
about Modern Algebra
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Modern Algebra

A critical study of the foundations of derivation equations, operator spaces, and such basic topics. Recent developments in this field will be investigated and independent investigation will be encouraged. Prerequisite: A grade of at least a C in MATH 3373 and either 3380 or 5382.
about Foundations of Differential Equations
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Foundations of Differential Equations

MATH 5312. Functions of a Complex Variable.
Modern developments in the field of a complex variable. Prerequisite: A grade of at least a C in MATH 3373; either 3380 or 5382; and 4315 or departmental approval.
about Functions of a Complex Variable
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Functions of a Complex Variable

MATH 5313. Field Theory.
Topics in field theory, separable extensions, and Galois Theory. Prerequisite: A grade of at least a C in MATH 4307 or a grade of at least a B in MATH 5384.
about Field Theory
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Field Theory

MATH 5314. Number Theory.
Topics in algebra selected from quadratic forms, elementary number theory, algebraic or analytic number theory, with material adapted to the needs of the class. Prerequisite: A grade of at least a C in MATH 4307 or a grade of at least a B in MATH 5384.
about Number Theory
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Number Theory

MATH 5317. Problems in Advanced Mathematics.
Open to graduate students on an individual basis by arrangement with the mathematics department. A considerable degree of mathematical maturity is required. May be repeated with different emphasis. This course does not count toward any degree in the Department of Mathematics.
about Problems in Advanced Mathematics
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from Graduate GPA|Leveling
Grade Mode: Leveling/Assistantships
about Problems in Advanced Mathematics

MATH 5319. The Theory of Integration.
A course in the theory of integration with special emphasis on the Lebesgue integrals. A course in the theory of real variables, with a knowledge of point set theory, is desirable as a background for this course. A considerable amount of mathematical maturity is required. Prerequisite: A grade of at least a C in MATH 4315 or departmental approval.
about The Theory of Integration
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about The Theory of Integration

MATH 5329. General Topology.
Point-set topology with an emphasis on general topological spaces; separation axioms, connectivity, the metrization theorem, and the C-W complexes. Prerequisite: A grade of at least a C in MATH 4330 or departmental approval.
about General Topology
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about General Topology

MATH 5331. Metric Spaces.
Point-set topology with an emphasis on metric spaces and compactness but including a brief introduction to general topological spaces. Prerequisite: A grade of at least a C in MATH 4330 or departmental approval.
about Metric Spaces
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Metric Spaces

Topics selected from optimization and control theory, numerical analysis, calculus of variations, boundary value problems, special functions, or tensor analysis. May be repeated with different emphasis for additional credit. Prerequisites: Six hours of advanced mathematics pertinent to topic and consent of the instructor.
about Studies in Applied Mathematics
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Studies in Applied Mathematics

MATH 5340. Scientific Computation.
This course will involve the analysis of algorithms from science and mathematics, and the implementation of these algorithms using a computer algebra system. Symbolic numerical and graphical techniques will be studied. Applications will be drawn from science, engineering, and mathematics. Prerequisite: MATH 3323 or consent of instructor.
about Scientific Computation
3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter
about Scientific Computation
MATH 5345. Regression Analysis.  
This course introduces formulation and statistical methodologies for simple and multiple regression, assessment of model fit, model design, and criteria for selection of optimal regression models. Students will develop skills with the use of statistical packages and the writing of reports analyzing a variety of real-world data. Prerequisite: MATH 2472.  
About Regression Analysis  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter  
About Regression Analysis

MATH 5350. Combinatorics.  
This course, covers permutations, combinations, Stirling numbers, chromatic numbers, Ramsey numbers, generating functions, Polya theory, Latin squares and random block design. Prerequisite: MATH 3398 or consent of instructor.  
About Combinatorics  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter  
About Combinatorics

MATH 5355. Applied Algorithmic Graph Theory.  
This course is designed to emphasize the close tie between the theoretical and algorithmic aspects. The topics may include basic concepts such as connectivity, trees, planarity, coloring of graphs, matchings, and networks. It also covers many algorithms such as Max-flow Min-cut algorithm, maximum matching algorithm, and optimization algorithms for facility location problems in networks. Prerequisite: MATH 5388 or MATH 3398.  
About Applied and Algorithmic Graph Theory  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter  
About Applied and Algorithmic Graph Theory

Boolean algebra, counting techniques, discrete probability, graph theory, and related discrete mathematical structures that are commonly encountered in computer science. Prerequisite: A grade of at least C in MATH 2472.  
About Applied Discrete Mathematics  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter  
About Applied Discrete Mathematics

MATH 5360. Mathematical Modeling.  
This course introduces the process and techniques of mathematical modeling. It covers a variety of application areas from the natural sciences. Emphasis is placed on deterministic systems, stochastic models, and diffusion. Prerequisite: MATH 3373, MATH 3323, and MATH 5301, or consent of instructor.  
About Mathematical Modeling  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter  
About Mathematical Modeling

MATH 5373. Theory of Functions of Real Variables.  
This course will discuss those topics that will enable the student to obtain a better grasp of the fundamental concepts of the calculus of real variables and the more recent developments of this analysis. Prerequisite: A grade of at least a C in MATH 4315 or departmental approval.  
About Theory of Functions of Real Variables  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter  
About Theory of Functions of Real Variables

MATH 5374. Numerical Linear Algebra.  
This course introduces tools that mathematical scientists use with vectors and matrices. Applications include least squares and eigenvalue problems, and systems of equations from applied mathematics. The stability of algorithms to perturbations are considered. Theory is balanced with numerically implementing algorithms, in particular for iterative methods for large, sparse systems. Prerequisite: MATH 3377 with a C or higher.  
About Numerical Linear Algebra  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter  
About Numerical Linear Algebra

MATH 5376A. Design and Analysis of Experiments.  
This course introduces fundamental concepts in the design of experiments, justification of linear models, randomization and principles of blocking. It also discusses the construction and analysis of basic designs including fractional replication, composite designs, factorial designs, and incomplete block designs. Prerequisite: Approval of instructor.  
About Design and Analysis of Experiments  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Topics  
Grade Mode: Standard Letter  
About Design and Analysis of Experiments

MATH 5376B. Analysis of Variance.  
This course introduces basic methods, one-way, two-way ANOVA procedures, and multifactor ANOVA designs. Prerequisite: Approval of instructor.  
About Analysis of Variance  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Topics  
Grade Mode: Standard Letter  
About Analysis of Variance

MATH 5381. Foundations of Set Theory.  
A formal study of the theory of sets, relations, functions, finite and infinite sets, set operations and other selected topics. This course will also train the student in the understanding of mathematical logic and the writing of proofs. Prerequisite: A grade of at least C in MATH 2472.  
About Foundations of Set Theory  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter  
About Foundations of Set Theory
MATH 5382. Foundation of Real Analysis.
A course covering the foundations of mathematical analysis. Topics include: real numbers, sequences, series, and limits and continuity of functions. Prerequisite: MATH 5381.
Grade Mode: Standard Letter

Definitions and elementary properties of groups, rings, integral domains, fields and vector spaces with great emphasis on the rings of integers, rational numbers, complex numbers, polynomials, and the interplay between algebra and geometry. Prerequisite: MATH 5381.
Grade Mode: Standard Letter

MATH 5386. Knots and Surfaces, An Introduction to Low-Dimensional Topology.
Knot polynomials and other knot invariants. The topological classification of surfaces and topological invariants of surfaces. Prerequisite: A grade of at least C in MATH 2472.
Grade Mode: Standard Letter

MATH 5388. Discrete Mathematics.
This course covers topics from: basic and advanced techniques of counting, recurrence relations, discrete probability and statistics, and applications of graph theory. Prerequisites: A grade of at least C in MATH 2472.
Grade Mode: Standard Letter

MATH 5390. Statistics.
This course will cover not only some of the basic statistical ideas and techniques but also the mathematical and probabilistic underpinnings of these techniques with an emphasis on simulations and modeling. The planning, conducting, analysis, and reporting of experimental data will also be covered. Prerequisite: A grade of at least C in MATH 2472.
Grade Mode: Standard Letter

MATH 5392. Survey of Geometries.
A study of topics in geometry including geometrical transformations, the geometry fractals, projective geometry, Euclidean geometry, and non-Euclidean geometry. Prerequisite: A grade of at least C in MATH 2472.
Grade Mode: Standard Letter

MATH 5393. Numerical Optimization.
This course focuses on optimization methods for a broad range of applications, such as engineering and applied sciences. Subjects are the basic theory of optimization, numerical algorithms to locate points satisfying optimality conditions and to analyze the convergence properties. Prerequisites: MATH 2472, MATH 3377 and MATH 3383, with grades of "C" or higher.
Grade Mode: Standard Letter

MATH 5399A. Thesis.
This course represents a student’s initial thesis enrollment. No thesis credit is awarded until student has completed the thesis in Mathematics 5399B. Graded on a credit (CR), progress (PR), no-credit (F) basis.
Grade Mode: Credit/No Credit

MATH 5399B. Thesis.
This course represents a student’s continuing thesis enrollment. The student continues to enroll in this course until the thesis is submitted for binding. Graded on a credit (CR), progress (PR), no-credit (F) basis.
Grade Mode: Credit/No Credit

MATH 5599B. Thesis.
This course represents a student’s continuing thesis enrollment. The student continues to enroll in this course until the thesis is submitted for binding. Graded on a credit (CR), progress (PR), no-credit (F) basis.
Grade Mode: Credit/No Credit

MATH 5711. Seminar in Teaching.
Seminar on individual study projects concerned with selected problems in the teaching of mathematics. This course does not count for degree credit. Graded on a credit (CR), no-credit (F) basis.
Grade Mode: Leveling/Assistantship
Course Attribute(s): Graduate Assistantship|Exclude from Graduate GPA
MATH 7187. Seminar in Mathematics.
Students are required to attend weekly research seminars in mathematics and to give at least one research presentation in the seminar during the semester. This course is repeatable for credit.
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Seminar in Mathematics

MATH 7188. Seminar in Mathematics Education.
Students are required to attend weekly research seminars in Mathematics Education and to give at least one research presentation in the seminar during the semester. This course is repeatable for credit.
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Seminar in Mathematics Education

MATH 7199A. Dissertation in Mathematics Education.
Original research and writing in Mathematics Education to be accomplished under direct supervision of the dissertation advisor. While conducting dissertation research and writing, students must be continuously enrolled each long semester. Graded on a credit (CR), no-credit (F) basis.
2 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit
about Dissertation in Mathematics Education

MATH 7299A. Dissertation in Mathematics Education.
This course represents a Mathematics Education student's dissertation enrollments. The course can be repeated as necessary. The dissertation credit (18 hours) will not be awarded until the dissertation is submitted for binding. Prerequisite: completion of the core and required concentration courses, or approval of student's dissertation advisor.
2 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit
about Dissertation in Mathematics Education

MATH 7301. Studies in Mathematics.
This course provides basic foundations in Mathematics for students entering the doctoral program in Mathematics Education. This course may be repeated, but the course does not earn graduate degree credit and cannot be used for degree credit.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from Graduate GPA|Leveling
Grade Mode: Leveling/Assistantships
about Studies in Mathematics

MATH 7302. History of Mathematics.
A study of the development of mathematics and of the accomplishments of men and women who contributed to its progress.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about History of Mathematics

MATH 7303. Analysis I.
This course covers foundations of modern analysis. Topics include: sequences, LimSup, LimInf, Sigma Algebras of sets that include open and closed sets, sequences of functions, pointwise and uniform convergence, lower and upper semi-continuity, Borel sets, outer measure, and Lebesgue measure. Prerequisite: MATH 4315.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Analysis I

MATH 7306. Current Research in Math Education.
This course surveys the various current social, political, and economic trends in local, state, national, and international settings that are related to research in Mathematics Education.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Current Research in Math Education

MATH 7307. Algebra I.
Applications of Algebra and topics in modern algebra, including permutation groups, symmetry groups, Sylow theorems, and select topics from Ring Theory. Prerequisite: MATH 4307.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Algebra I

MATH 7309. Topology I.
A course in point-set topology emphasizing topological spaces, continuous functions, connectedness, compactness, countability, separability, metrizability, CW complexes, simplicial complexes, nerves, and dimension theory. Prerequisite: MATH 4330.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Topology I

MATH 7313. Analysis II.
This course covers the theory of integration with special emphasis on Lebesgue integrals. Topics include: Lebesgue integral, Bounded Convergence theorem, differentiation and integration, absolute continuity, and Lp spaces. Prerequisite: Math 7303.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Analysis II

MATH 7317. Algebra II.
A study of the important algebraic structures of rings and fields. Topics covered include rings, ideals, modules, polynomial rings, Euclidean algorithm, finite fields, and field extensions. Topics also include an introduction to Galois Theory with an emphasis on the geometric applications. Prerequisite: MATH 7307.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Algebra II
MATH 7319. Topology II: Algebraic Topology.
This course covers the fundamental concepts and tools of algebraic topology. Topics include the fundamental group, covering spaces, homotopy type, the higher homotopy groups, singular homology theory, and the computation of homology groups via exact sequences and applications. Prerequisite: MATH 7307 and MATH 7309.
Grade Mode: Standard Letter
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
about Topology II: Algebraic Topology

MATH 7321. Graph Theory.
Topics in this course include trees, connectivity of graphs, Eulerian graphs, Hamiltonian graphs, planar graphs, graph coloring, matchings, factorizations, digraphs, networks, and network flow problems. Prerequisite: MATH 3398.
Grade Mode: Standard Letter
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
about Graph Theory

MATH 7324. Curriculum Design & Analysis.
This course examines, analyzes, and evaluates the various concepts, topics, methods, and techniques that are related to curriculum design in Mathematics Education for grade levels P-16. Prerequisite: Math 2321, Math 3305.
Grade Mode: Standard Letter
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
about Curriculum Design & Analysis

MATH 7325. Statistics 1.
A study of the mathematical and probabilistic underpinnings of the techniques used in statistical inference. Topics covered include sampling, sampling distributions, confidence intervals, and hypothesis testing with an emphasis on both simulations and derivations. Prerequisite: Math 2321, Math 3305.
Grade Mode: Standard Letter
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
about Statistics 1

MATH 7328. Instructional Techniques & Assessments.
This course examines, analyzes, and evaluates the various concepts, topics, methods, and techniques of instruction in Mathematics Education and the related assessment procedures for each for grade levels P-20. Prerequisite: MATH 3398.
Grade Mode: Standard Letter
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
about Instructional Techniques & Assessments

MATH 7331. Combinatorics.
This course is a study of fundamental principles of combinatorics. Topics include: permutations and combinations, the Pigeonhole principle, the principle of inclusion-exclusion, binomial and multinomial theorems, special counting sequences, partitions, posets, extremal set theory, generating functions, recurrence relations, and the Polya theory of counting. Prerequisite: MATH 3398.
Grade Mode: Standard Letter
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
about Combinatorics

MATH 7335. Statistics II: Linear Modeling.
A study of the formulation and statistical methodologies for fitting linear models. Topics include the general linear hypothesis, least-squares estimation, Gauss-Markov theorem, assessment of model fit, effects of departures from assumptions, model design, and criteria for selection of optimal regression models. Prerequisite: MATH 3377 and MATH 7325.
Grade Mode: Standard Letter
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
about Statistics II: Linear Modeling

MATH 7346. Quantitative Research Analysis in Mathematics Education.
This course surveys the various research techniques used in quantitative analysis for mathematics education and covers topics such as experimental design, statistical analysis, and use of appropriate design methodologies to achieve the strongest possible evidence to support or refute a knowledge claim. Prerequisite: MATH 7306 and MATH 7325.
Grade Mode: Standard Letter
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
about Quantitative Research Analysis in Mathematics Education

MATH 7356A. Advanced Quantitative Research.
This course encompasses investigation, development, and demonstration of competence, design, and execution for mathematics education problems in quantitative research. Prerequisite: MATH 7346.
Grade Mode: Standard Letter
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
about Advanced Quantitative Research

MATH 7356B. Advanced Qualitative Research.
This course encompasses investigation, development, and demonstration of competence, design, and execution for mathematics education problems in qualitative research. Prerequisite: ED 7352.
Grade Mode: Standard Letter
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
about Advanced Qualitative Research

MATH 7356C. Action Research in Mathematics Education.
This course examines underlying theory and issues in action research model and the development of action research projects. Prerequisites: MATH 7346 or ED 7352.
Grade Mode: Standard Letter
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
about Action Research in Mathematics Education

MATH 7361. Seminar in Advanced Mathematics.
Material in course will vary with the interest of students and faculty. A detailed study of subject matter may be chosen from advanced areas of analysis; algebra; topology and geometry; applied mathematics; and probability and statistics. This course is repeatable for credit when subject matter varies.
Grade Mode: Standard Letter
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
about Seminar in Advanced Mathematics
MATH 7366A. Teaching Post-Secondary Students (Developmental Math, Service Courses, and Majors).
This course examines how to develop and teach post-secondary students. The course references the recommendations of government agencies and professional organizations and allows for the investigation of research-based models. Prerequisites: MATH 7306.
about Teaching Post-Secondary Students (Developmental Math, Service Courses, and Majors)
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Teaching Post-Secondary Students (Developmental Math, Service Courses, and Majors)

MATH 7366B. Teaching K-12 Students (Elementary, Middle School, and High School).
This course examines how to develop and teach K-12 students. The course references the recommendations of government agencies and professional organizations and allows for the investigation of research-based models. Prerequisite: MATH 7306.
about Teaching K-12 Students (Elementary, Middle School, and High School)
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Teaching K-12 Students (Elementary, Middle School, and High School)

MATH 7366C. Teaching Teachers (In-Service; Pre-Service).
This course examines how to prepare teachers of mathematics. The course references the recommendations of government agencies and professional organizations and allows for the investigation of research-based models. Prerequisite: MATH 7306.
about Teaching Teachers (In-Service; Pre-Service)
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Teaching Teachers (In-Service; Pre-Service)

MATH 7366D. Teaching Specialized Content.
This course will be an in-depth study of a specialized content area in mathematics with an emphasis on teaching. The specific content area will vary by instructor. Examples include Euclidean Simplex Geometry and Discrete Probability Spaces with Implications for Public School Curriculum.
about Teaching Specialized Content
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Teaching Specialized Content

MATH 7366E. Developmental Mathematics Curriculum.
This course surveys the research, development, and evaluation of the scope and sequence of developmental mathematics curriculum. The course references the recommendations of government agencies and professional organizations and allows for the investigation of research-based models.
about Developmental Mathematics Curriculum
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter
about Developmental Mathematics Curriculum

MATH 7371A. Advanced Graph Theory.
Topics in this course include Turán’s problems, Ramsey theory, random graph theory, extremal graph theory, algebraic graph theory, domination of graphs, distance problems, and applications. Prerequisite: MATH 7321.
about Advanced Graph Theory
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Advanced Graph Theory

MATH 7371B. Advanced Combinatorics.
Topics in this course include Block designs, Latin squares, combinatorial optimization problems, coding theory, matroids, difference sets, and finite geometry. Prerequisite: MATH 7331.
about Advanced Combinatorics
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Advanced Combinatorics

MATH 7371C. Combinatorial Number Theory.
A study of fundamental techniques in combinatorial number theory. Topics will include Waring’s problem, additive number theory, and probabilistic methods in number theory. Prerequisite: MATH 7331.
about Combinatorial Number Theory
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Combinatorial Number Theory

MATH 7371D. Discrete Optimization.
A study of some fundamental techniques in discrete optimization. Topics include discrete optimization, linear programming, integer programming, integer nonlinear programming, dynamic programming, location problem, scheduling problem, transportation problem, postman problem, traveling salesman problem, matroids, and NP-completeness. Prerequisites: MATH 7321 and 7331.
about Discrete Optimization
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Discrete Optimization

MATH 7371E. Algorithms and Complexity.
A study of some fundamental concepts of computability and complexity. Topics include polynomially bounded problems, NP-complete problems, exponentially hard problems, undecidable problems, and reducibility. Prerequisite: MATH 7331.
about Algorithms and Complexity
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Topics
Grade Mode: Standard Letter
about Algorithms and Complexity
MATH 7371F. Probabilistic Methods in Discrete Mathematics.
A study of some fundamental probabilistic techniques used to solve problems in graph theory, combinatorics, combinatorial number theory, combinatorial geometry, and algorithm. Topics include linearity of expectation, alterations, second moment, local lemma, correlation inequalities, martingales, Poisson paradigm, and pseudo-randomness. Prerequisites: MATH 7321 and 7331.

This course introduces fundamental concepts in logic, Boolean algebra, and binomial coefficients; and applications in different fields such as complexity of algorithms and network theory. Prerequisites: MATH 2472 and MATH 4307 with a grade of "C" or higher, or with departmental approval.

MATH 7371H. Combinatorial Networks.
Combinatorial Networks is an area of study of certain types of networks using combinatorial methods extensively. This course introduces fundamental basics as well as the latest development in this area of research. Prerequisite: MATH 5307/7307 with a grade of "C" or higher.

MATH 7375C. Time Series Analysis.
A study of the theory of time-dependent data. The analysis includes modeling, estimation, and testing; alternating between the time domain; using autoregressive and moving average models and the frequency domain; and using spectral analysis. Prerequisite: MATH 7335.

MATH 7375D. Advanced linear Modeling.
The course provides an extension of regression methodology to more general settings where standard assumptions for ordinary least squares are violated. Topics include generalized least squares, robust regression, bootstrap, regression in the presence of autocorrelated errors, generalized linear models, and logistic and Poisson regression. Prerequisite: MATH 7335.

MATH 7378A. Problem Solving, Reasoning, and Proof.
A study of the fundamental concepts of problem solving, logic, set theory, and mathematical proof and applications of these concepts in mathematics curriculum for grades P-20. Prerequisite: MATH 7306.

MATH 7378B. Connecting and Communicating Math.
This course examines one of the basic principles involved in mathematics education: Connecting and Communicating Mathematics. This fundamental theme will be reviewed, researched, and discussed. Prerequisite: MATH 7306.

MATH 7378C. Representing Fundamental Math Ideas (Function, Data Analysis, and Enumeration).
This course examines the basic principles involved in mathematics education. The process of representing fundamental mathematical ideas will be reviewed, researched, and discussed. Prerequisite: MATH 7306.

MATH 7378D. Math Technologies.
This course examines the basic principles involved in mathematics education: Technology. This fundamental theme will be reviewed, researched, and discussed. Prerequisite: MATH 7306.

MATH 7378E. Developmental Mathematics Perspectives.
This course examines developmental mathematics-specific strands including technological course support and placement tools/decisions. Issues related to the first mathematics core course required of undergraduates will also be addressed.

MATH 7378F. Research on Mathematical Problem Solving in Secondary Schools.
In this course a careful study is made of elementary techniques for problem solving in a variety of domains, including algebra, number theory, combinatorics, geometry, and logic puzzles. Students will learn these techniques by actually working on a collection of problems in each of these areas. Students will read and examine research about various aspects of problem solving and research in math education that includes both teacher training and student learning.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter
about Research on Mathematical Problem Solving in Secondary Schools

MATH 7385. Independent Study in Mathematics.
Student will work directly with a faculty member and develop in-depth knowledge in a specific topic area of mathematics. Topics vary according to student's needs and demands. Repeatable with different emphasis.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Independent Study in Mathematics

MATH 7386. Independent Study in Mathematics Education.
Student will work directly with a faculty member and develop in-depth knowledge in a specific topic area of Mathematics Education. Topics vary according to student's needs and demands. Repeatable with different emphasis.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Independent Study in Mathematics Education

MATH 7389. Internship.
Students will work under the supervision of a faculty member to gain practical knowledge in Mathematics Education. Student experience can come from industry, government agencies, or other sources but must directly apply to furthering knowledge of mathematics education or its application.

3 Credit Hours. 0 Lecture Contact Hours. 10 Lab Contact Hours.
Grade Mode: Standard Letter
about Internship

MATH 7396. Mathematics Education Research Seminar.
Collaborative research projects with faculty through identifying an educational issue, reviewing literature, creating a research question, designing a methodology, analyzing data, drawing conclusions, implications, and creating a draft of a publishable paper. Prerequisite: MATH 7356, and (ED 7352 or MATH 7346).

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit
about Mathematics Education Research Seminar

MATH 7399A. Dissertation in Mathematics Education.
This course represents a Mathematics Education student's dissertation enrollments. The course can be repeated as necessary. The dissertation credit (18 hours) will not be awarded until the dissertation is submitted for binding. Prerequisite: completion of the core and required concentration courses, or approval of student's dissertation advisor.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit
about Dissertation in Mathematics Education

MATH 7599A. Dissertation in Mathematics Education.
This course represents a Mathematics Education student's dissertation enrollments. The course can be repeated as necessary. The dissertation credit (18 hours) will not be awarded until the dissertation is submitted for binding. Prerequisite: completion of the core and required concentration courses, or approval of student's dissertation advisor.

5 Credit Hours. 5 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit
about Dissertation in Mathematics Education

MATH 7699A. Dissertation in Mathematics Education.
This course represents a Mathematics Education student's dissertation enrollments. The course can be repeated as necessary. The dissertation credit (18 hours) will not be awarded until the dissertation is submitted for binding. Prerequisite: completion of the core and required concentration courses, or approval of student's dissertation advisor.

6 Credit Hours. 6 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit
about Dissertation in Mathematics Education

MATH 7999A. Dissertation in Mathematics Education.
This course represents a Mathematics Education student's dissertation enrollments. The course can be repeated as necessary. The dissertation credit (18 hours) will not be awarded until the dissertation is submitted for binding. Prerequisite: completion of the core and required concentration courses, or approval of student's dissertation advisor.

9 Credit Hours. 9 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit
about Dissertation in Mathematics Education