Mathematics Courses

MATH 1000 Companion to College Algebra (1 credit)
An optional companion course designed to support students concurrently enrolled in MATH 1170 College Algebra, this course will provide support for MATH 1170, including supplementary instruction on College Algebra topics and just-in-time review of prerequisite concepts. Topics, which will parallel those in Math 1170, include review of properties of real numbers, radical expressions, linear equations and inequalities and their graphs, polynomial functions and their graphs, transformations of functions, exponential and logarithmic functions, and linear programming. This course is intended strictly as support for MATH 1170 and does not fulfill a college goal area requirement. Three years of high school mathematics (including two years of algebra) and an appropriate score on the Mathematics Placement Test.

MATH 1011 Mathematics for Elementary School Teachers I (3 credits)
This course meets the new BOT fundamental topics in arithmetic competencies. These topics include addition, subtraction, multiplication, and division of whole numbers; number theory related to fractions; decimals; and integers. This is the first of two mathematics courses providing the background for teaching in the elementary school. Emphasizes the use of mathematics manipulatives for modeling the basic operations. Prerequisite: Elementary education major or consent of instructor.

MATH 1013 Mathematics for Elementary School Teachers II (3 credits)
This course meets the new BOT introduction to higher mathematics competencies. These topics include geometry, discrete mathematics, probability, and statistics. This is the second of two mathematics courses providing the background for teaching in the elementary school. Emphasizes the use of mathematics manipulatives for modeling the basic concepts. Prerequisite: MATH 1011.

MATH 1100 Mathematical Reasoning (3 credits)
Mathematical reasoning and algebraic concepts applied to a selection of topics, which may include the mathematics of social choice, and the mathematics of management, geometry, and problem solving. Descriptive statistics and introductory probability and inferential statistics. A graphing calculator is required. Not open to students who have completed Math 1107 or Math 1170. Prerequisites: Two years of high school algebra and an appropriate score on the Mathematics Placement Test. [Core Curriculum Goal Area 4]

MATH 1107 Introduction to Mathematical Sciences (3 credits)
This course integrates the study of algebra, statistics, and computing in a laboratory-instruction environment. Topics include functions, graphical and tabular analysis, rate of change, syntax and semantics, the process of computing, data manipulation, sampling, statistical measures, basic probability, and correlation. Examples are drawn from a wide range of disciplines and content is taught within the framework of discipline-specific examples. Students learn to use the software package Microsoft Excel. Not open to students who have completed Math 1100 or Math 1170. Prerequisites: Two years of high school algebra and an appropriate score on the Mathematics Placement Test. [Core Curriculum Goal Area 4]

MATH 1120 Environmental Mathematics (3 credits)
This course will explore topics in which mathematics is used to investigate and inform decisions about environmental issues. Environmental issues addressed may include a study of population change, geoscience topics as related to economics and water resources, the average temperature of the earth, and data about the environment. Mathematical concepts may include iterative functions, unit conversion and statistics. Prerequisite(s): Three years of high school mathematics (including two years of algebra) and an appropriate score on the Mathematics Placement Test. [Core Curriculum Goal Area(s) 4 & 10]

MATH 1170 College Algebra (3 credits)
Problem solving with linear, quadratic, rational and absolute value equations and inequalities; function notation and inverses; graphs of relations and functions; polynomial, rational, exponential, and logarithmic functions and applications; systems of equations and inequalities, matrices. Prerequisites: Three years of high school mathematics (including two years of algebra) and an appropriate score on the Mathematics Placement Test. [Core Curriculum Goal Area 4]

MATH 1180 Trigonometry (3 credits)
Trigonometric functions, identities, equations, and applications. Prerequisites: Successful completion of Math 1170, or 3 years of high school math (including two years of algebra), and an appropriate score on the Mathematics Placement Test. [Core Curriculum Goal Area 4]

MATH 1470 Precalculus (3 credits)
Intended to provide the essential mathematical background from trigonometry needed in calculus. Topics include trigonometric and inverse trigonometric functions, identities, applications, polar coordinates, and parametric equations. A graphing calculator is required. Prerequisites: Three years of high school mathematics (including two years of algebra with a half year of trigonometry strongly recommended) and an appropriate score on the Mathematics Placement Test, or completion or concurrent enrollment in MATH 1170. [Core Curriculum Goal Area 4]

MATH 2210 Discrete Mathematics (4 credits)
Symbolic logic, number concepts, mathematical induction, set theory, relations and functions, graphs, trees, recurrence relations, and complexity of algorithms. Prerequisites: CS 2321 or Math 2471 or instructor permission.

MATH 2471 Calculus I (5 credits)
Limits, differentiation and integration of algebraic and trigonometric functions; applications of the derivative and curve sketching; applications of integration. A graphing calculator is required. Prerequisite: An appropriate ACT math sub-score or Mathematics Placement Test score or a grade of C or better in MATH 1470 or grades of C or better in both MATH 1170 and MATH 1180 or consent of instructor. [Core Curriculum Goal Area 4]

MATH 2472 Calculus II (5 credits)
Differentiation and integration of transcendental functions, techniques of integration, infinite sequences and series, parametric equations, polar coordinates, analytic geometry, and vectors. A graphing calculator is required. Prerequisite(s): grade of C or better in MATH 2471. [Core Curriculum Goal Area 4]

MATH 2480 Multivariable Calculus (4 credits)
Three dimensional analytic geometry, spherical, and cylindrical coordinate systems, vectors, partial derivatives, and multiple integrals. A graphing calculator is required. Prerequisite: Successful completion of MATH 2472.

MATH 2490 Differential Equations (4 credits)
Ordinary differential equations including first order and second order linear equations, series solutions, Laplace transformations, existence and uniqueness theory, systems of linear and nonlinear equations, dynamical systems and applications. A graphing calculator is required. Prerequisite: MATH 2472.

MATH 3065 Mathematical Foundations of Algebra (4 credits)
This course investigates concepts of patterns, relations, and functions. Prerequisites: MATH 1011 or equivalent or consent of instructor. Might not be offered every year.

MATH 3066 Geometry and Technology (4 credits)
This course examines the concepts of patterns, shape and space; spatial sense; plane, solid, and coordinate geometry systems; generalizing geometric principals; limits, derivatives and integrals; and appropriate use of technology for Geometry. Prerequisites: MATH 1011 or equivalent or consent of instructor; (Might not be offered every year.)

MATH 3067 Data, Probability, and Statistics (4 credits)
This course explores data investigations and concepts of randomness and uncertainty. The collection, display, analysis, and interpretation of data are studied. Additional topics include randomness, sampling, probability in simple and compound events, the prediction of outcomes using a variety of techniques, and the comparison of theoretical and empirical results of experiments. Prerequisite MATH 1011 or equivalent or consent of instructor.

MATH 3260 Mathematical Problem Solving (3 credits)
Investigation of problems and the process of problem solving across a variety of mathematical areas. Development and application of strategies used to solve problems with emphasis on multistep and nonroutine problems. Application of the process of mathematical modeling to real situations. Prerequisite: MATH 2210. (Might not be offered every year.)

MATH 3310 Linear Algebra (4 credits)
Systems of linear equations, linear transformations, matrix operations, vector spaces, eigenvalues and eigenvectors, orthogonality, and applications. Prerequisite(s): MATH 2472 or consent of instructor

MATH 3440 Introduction to Fractals & Chaos (3 credits)
An introduction to the topics of fractal geometry, chaos, and dynamic mathematical systems. Topics included are iteration, fractals and fractal dimension, iterated function systems, Julia set, Mandelbrot set, and bifurcation. Prerequisites: MATH 2210 and MATH 2472. (Might not be offered every year.)

MATH 3560 Classical and Modern Geometry (3 credits)
Euclidean and non-Euclidean geometry, axiomatic systems, the geometry of solids, transformations, measurement, and fractal geometry. Prerequisite: MATH 2210.

MATH 3710 Mathematical Modeling (3 credits)
Mathematical modeling of applications that involve difference equations, matrices, probability, differentiation, and integration. Applications may be chosen from among the biological and p hysical sciences, economics, the social sciences, or other areas of interest. A graphing calculator is required. Prerequisite: MATH 2472. (Might not be offered every year.)

MATH 3720 Numerical Methods (3 credits)
Root finding techniques, fixed point iteration, polynomial interpolation, methods for solving linear and nonlinear systems of equations, numerical integration and differentiation, numerical solutions of differential equations, and the method of steepest descent. Prerequisite: MATH 2472.

MATH 3820 History of Mathematics (3 credits)
Historical investigation and presentation of the sources and growth of mathematical knowledge and principles, including Peano's axioms, the Axiom of Choice, and Russell's Paradox. Prerequisites: Junior or senior status and consent of the instructor. (Might not be offered every year.)

MATH 3961 Special Purpose Instruction (3 credits)
A course intended for specific groups or organizations outside the University community.

MATH 3962 Special Purpose Instruction (3 credits)
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MATH 3968 Special Purpose Instruction (3 credits)
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MATH 3969 Special Purpose Instruction (3 credits)
A course intended for specific groups or organizations outside the University community.

MATH 4240 Number Theory (3 credits)
Properties of integers, primes and their distribution, linear and quadratic congruences, number-theoretic functions, Diophantine equations, Fibonacci numbers, primitive roots and quadratic reciprocity. Prerequisite: MATH 2210. (Might not be offered every year.)

MATH 4350 Abstract Algebra (3 credits)
A study of abstract algebraic systems with an emphasis on the development of number systems, properties of polynomials, rings, integral domains and fields. Prerequisites: MATH 3310. (Might not be offered every year.)

MATH 4371 Modern Algebra (3 credits)
A study of abstract algebraic systems with an emphasis on groups and an introduction to rings. Prerequisite: MATH 3310.

MATH 4410 Introduction to Analysis (3 credits)
Functions, sequences, and properties of limits. Topics from calculus including continuity, differentiation, and integration. Open and closed sets, cluster points, and other topological properties. Prerequisites: MATH 2210 and MATH 2472.

MATH 4760 Topics in Applied Mathematics (3 credits)
This course focuses on an advanced topic from applied mathematics. Possible topics include game theory, operations research, and cryptography. May be repeated for up to 6 credits with different topics. Prerequisite: MATH 2472. (Might not be offered every year.)

MATH 4917 DIS Tchg Assoc | (1-2 credits)
Directed Independent Study | Teaching Associate

All-University Courses

The course numbers listed below, not always included in the semester class schedule, may be registered for by consent of the advisor, instructor, or department chair, or may be assigned by the department when warranted. Individual registration requires previous arrangement by the student and the completion of any required form or planning outline as well as any prerequisites.

1910, 2910, 3910, 4910 DIRECTED INDEPENDENT STUDY
1920, 2920, 3920, 4920 DIRECTED GROUP STUDY
1930, 2930, 3930, 4930 EXPERIMENTAL COURSE
1940, 2940, 3940, 4940 IN-SERVICE COURSE
1950, 2950, 3950, 4950 WORKSHOP, INSTITUTE, TOUR
1960, 2960, 3960, 4960 SPECIAL PURPOSE INSTRUCTION
1970, 2970, 3970, 4970 INTERNSHIP
1980, 2980, 3980, 4980 RESEARCH
1990, 2990, 3990, 4990 THESIS