MATHEMATICS (MATH)

MATH 099 Intermediate Algebra (3)
Covers polynomials, exponents, linear and quadratic equations and inequalities relations, functions, lines, graphs, and rational functions. Prerequisite: One year of high school algebra and one year of high school geometry. (Note: MATH 099 Intermediate Algebra may not be taken for graduation credit).

MATH 102 Contemporary Mathematical Thinking (3)
Prerequisite: MATH 099
A course for the non-major focusing on mathematical reasoning through the exploration of important mathematical concepts. Topics will be chosen from the following: geometry; number theory; logic/set theory; probability and statistics; graph theory; linear programming; game/decision theory; mathematics of finance. Prerequisite may be met with H.S. Geometry.
Meets general education requirements: GE-Math/Science/Comp Sci Elec, GE-Numerical Understanding
Restrictions: Enrollment limited to students in the Arts and Sciences, Business Health Admin. or Nursing colleges.

MATH 105 Introduction to Statistics (3)
Prerequisite: MATH 099
Surveys methods for describing data numerically and graphically. Explores relationships between quantitative variables using correlation and least-squares regression. Presents an overview of the data-collection process. Covers basic probability theory needed for understanding statistical inference. Inferential techniques such as interval estimation and tests of hypotheses will be explored. Prerequisite may be met with H.S. Geometry.
Meets general education requirements: GE-Math/Science/Comp Sci Elec, GE-Numerical Understanding
IAI Course Number: M1 902

MATH 108 Math for Teachers I (3)
Prerequisite: MATH 099
Is intended for the elementary education major. It presents the mathematical concepts underlying the basic operations for whole numbers, integers, rational numbers, and real numbers. The course includes a study of numeration systems, bases, basic number theory, functions, measurement and geometry. Prerequisite may be met with H.S. Geometry.
IAI Course Number: M1 903

MATH 109 Math for Teachers II (3)
Prerequisite: MATH 108
Is a continuation of MATH 108 and is intended for the pre-service elementary teacher. The course includes a study of probability, introductory statistics, Euclidean geometry and constructions, the geometry of motion, tessellations, measurement, and Cartesian coordinate graphing.
Meets general education requirements: GE-Math/Science/Comp Sci Elec, GE-Numerical Understanding
IAI Course Number: M1 903

MATH 111 College Algebra (3)
Prerequisite: MATH 099
Reviews relations, functions, linear and quadratic equations and logarithms; covers theory of equations, complex numbers, matrix theory, sequences and series, binomial theorem, math induction and conic sections. Prerequisite may be met with H.S. Geometry.

MATH 121 Finite Mathematics (3)
Prerequisite: MATH 111
Reviews matrix algebra and solution of systems of equations using matrices. This course covers other matrix applications, linear programming, set theory, probability, stochastic processes, game theory, and Markov chains emphasizing applications in business and economics.
Meets general education requirements: GE-Math/Science/Comp Sci Elec, GE-Numerical Understanding
IAI Course Number: M1 906

MATH 125 Pre-Calculus (5)
Prerequisite: MATH 099
This is a standard pre-calculus course. Topics include a review of algebra; a study of functions and graphs including polynomials, rational functions, exponential and logarithmic functions; a complete introduction to trigonometry; and systems of equations and inequalities.. Prerequisite may be met with H.S. Geometry.

MATH 170 Applied Calculus (4)
Prerequisite: MATH 111 or MATH 125
Covers limits and continuity; derivatives and integrals of algebraic, logarithmic, and exponential functions. Special attention is given to applications in the life sciences and business.
Meets general education requirements: GE-Math/Science/Comp Sci Elec, GE-Numerical Understanding
IAI Course Number: M1 900B

MATH 175 Statistics (4)
Prerequisite: MATH 111
Surveys descriptive measures of central tendency, dispersion, and association, along with graphical techniques for describing data. Generation of data through surveys and experiments is discussed. The inference techniques of interval estimation and tests of hypotheses will be discussed in detail. The Chi-square test, analysis of variance, and inference for regression will also be addressed.
Meets general education requirements: GE-Math/Science/Comp Sci Elec, GE-Numerical Understanding
IAI Course Number: M1 902

MATH 181 Calculus/Analytic Geometry I (5)
Prerequisite: MATH 125
Addresses functions, limits, continuity, derivatives, integrals, integration techniques, trigonometric and hyperbolic functions and applications.
Meets general education requirements: GE-Math/Science/Comp Sci Elec, GE-Numerical Understanding
IAI Course Number: EGR 901, M1 900-1, MTH 901

MATH 182 Calculus/Analytic Geometry II (4)
Prerequisite: MATH 181
Is a continuation of MATH 181, and further addresses differentiation and integration techniques, polar coordinates, improper integrals, L' Hopital's Rule and power series.
Meets general education requirements: GE-Math/Science/Comp Sci Elec, GE-Numerical Understanding
IAI Course Number: EGR 902, M1 900-2, MTH 902

MATH 271 Calculus III (4)
Prerequisite: MATH 182
Covers calculus of functions of several variables; potential functions; maxima and minima; line integrals; multiple integrals; Green's and Stokes' Theorems; Taylor series of several variables.
IAI Course Number: EGR 903, M1 900-3, MTH 903

MATH 275 Linear Algebra (3)
Prerequisite: MATH 271 (may be taken concurrently)
Covers vectors, matrix operations, determinants, linear functions, vector spaces and subspaces, basis and dimension, linear transformations, inner product spaces, and applications.
IAI Course Number: MTH 911

MATH 280 Differential Equations (3)
Prerequisite: MATH 271
Covers ordinary differential equations of first order, applications, linear differential equations, simultaneous linear differential equations, Laplace Transforms, numerical techniques, and series solution of differential equations.
IAI Course Number: EGR 904, MTH 912

MATH 294 Topics in Mathematics (1-3)
Provides for the study of selected topics not included in the regular curriculum. It may be repeated for credit if the content changes substantially.

MATH 310 Theory of Interest (3)
Prerequisite: MATH 182 or MATH 170
Examines the topics of measurement of interest, including accumulated and present value, annuities, yield rates, amortization schedules and sinking funds, and bonds.

MATH 320 History of Mathematics I (3)
Prerequisite: MATH 181
Surveys the growth and contributions of mathematics to knowledge and learning from ancient times to the mid-17th century. Development of mathematics is traced through study of mathematicians and their ideas.

MATH 321 History of Mathematics II (3)
Prerequisite: MATH 181
Surveys the growth and contributions of mathematics to knowledge and learning from the mid-17th century to present day. The development of mathematics is traced through study of mathematicians and their ideas.

MATH 326 Discrete Mathematics (3)
Prerequisite: MATH 181
Begins with the foundations of logic and mathematical reasoning, deductive and inductive proof. The study of discrete structures may include set theory, functions, relations, number theory, matrices, combinatorics, algorithms, recursion, graph theory, trees, Boolean algebra, and computation models.

MATH 330 Introduction to Data Science (3)
Prerequisite: MATH 175
Is an introduction to Data Science. Students will learn how to access data (both structured and unstructured) from the internet, then "clean" and organize it into tables and graphs. They will explore ways of finding patterns in the data and to make predictions about future data. Detailing processes and communicating results will be emphasized. An open-source programming language (e.g., Python or R) will be employed.

MATH 331 Mathematical Statistics I (3)
Prerequisite: MATH 271
Is a calculus-based coverage of set-theoretic probability, random variables, discrete and continuous probability distributions, mathematical expectation, and multivariate probability distributions.

MATH 332 Mathematical Statistics II (3)
Prerequisite: MATH 331
Is a continuation of MATH 331. Covers sampling distributions, the central limit theorem, point and interval estimation, hypothesis testing, and goodness of fit. Nonparametric methods will also be addressed.

MATH 351 College Geometry (3)
Prerequisite: MATH 181
Covers the foundations of Euclidean Geometry based on axioms equivalent to those of Hilbert. The course includes an introduction to non-Euclidean Geometries.

MATH 365 Operations Research (3)
Prerequisite: MATH 175 and (MATH 182 or MATH 170)
Presents the quantitative modeling techniques of linear programming, dynamic programming, queuing theory, and simulation.

MATH 370 Applied Regression Analysis (3)
Prerequisite: MATH 175 or MATH 331
Includes a study of inference, diagnostics, and remedial measures for both simple and multiple linear regression; polynomial regression; model building; single- and two-factor analysis-of-variance; and experimental design.

MATH 371 Introduction to Analysis (3)
Prerequisite: MATH 326 or MATH 351
Includes a rigorous discussion of real numbers, infinite sets, point set topology, sequences of functions, continuity and Riemann integrals.

MATH 375 Abstract Algebra I (3)
Prerequisite: MATH 275
Covers binary operations, groups, subgroups, permutations, cyclic groups, cosets, normal subgroups, homomorphisms, and isomorphisms.

MATH 380 Numerical Analysis (3)
Prerequisite: MATH 271
Covers computational methods for error estimation, solution of nonlinear equations and systems of linear equations, finite difference calculus, numerical differentiation and integration.

MATH 389 Meth Tchng Math Middle School (3)
Prerequisite: (MATH 181 and EDUC 360)
Is a prerequisite service course for prospective teachers of junior high school mathematics. The course includes an examination of mathematics curriculum, instructional techniques, the preparation of lessons, motivation techniques, design of homework assignments, preparation of tests, evaluation of student performance, and classroom organization in the junior high school setting. Microteaching and videotaping will be utilized for self-observation and evaluation.

MATH 390 Methods of Teaching Adolescents Mathematics (3)
Prerequisite: EDUC 210
Examines methods and techniques of teaching mathematics to middle grades and high school students. Focus will be upon adapting discipline specific knowledge into engaging lessons, use of technology, delivery methods, differentiation, instructional planning, and assessment procedures. Classroom organization and management, relevant content and instructional standards, and professional development will also be addressed.

MATH 391 Junior Seminar (1)
Provides an introduction to mathematical research methods, with the express purpose of transitioning the student to the Senior Seminar course the following term. This course will focus on exploring mathematical topics, reading the mathematical literature, and writing about one's understanding of the material. Library and internet source material will be utilized. At completion, the student will have identified a suitable topic for his/her senior paper with an initial outline and bibliography.
Restrictions: Enrollment limited to students with a semester level of Junior. Enrollment is limited to students with a major in Mathematics Computer Science or Mathematics.

MATH 490 Senior Seminar (2)
Offers seniors the opportunity to research and present topics of special interest not previously covered in depth by a mathematics course. Topics may be from analysis, algebra, geometry, history of mathematics, probability and statistics, or applied mathematics. Journal articles will be read and discussed. In addition, Major Portfolios will be assembled and evaluated as a significant portion of the grade awarded.
Restrictions: Enrollment limited to students with a semester level of Senior. Enrollment is limited to students with a major in Mathematics Computer Science or Mathematics.

MATH 494 Topics in Mathematics (1-3)
Is a title given to a course which covers specific themes, practices, and subject content not currently offered in the curriculum. This course is directed primarily to student majoring in the subject area and could be used to complete major requirements. The course will provide an in-depth study of a specific topic.

MATH 495 Directed Study (1-3)
An academic learning experience in which the student initiates designs, and executes the course under the supervision of the instructor.

MATH 496 Independent Study (1-3)
An academic learning experience in which the student initiates designs, and executes the course under the supervision of the instructor.