

MATHEMATICS (MAT)

MAT 100 Intermediate Algebra 3 credits

This course is not a general education course and should only be taken by students planning to take a course with MAT100 listed as a prerequisite. Topics include linear equations, systems of linear equations, operations of polynomials, factoring, quadratic equations, functions, inverses, exponentials, and logarithms.

MAT 101 Contemporary Mathematics 3 credits

This course was designed to give the liberal arts student an experience in contemporary mathematics with emphasis on its connection to society. The concepts include financial mathematics, statistics, apportionment, voting, graphs and networks.

MAT 110 Introduction to Probability and Statistics 3 credits

This course will explore fundamental topics from probability and descriptive and inferential statistics and apply these to a range of areas of study including business, social science, and biology. Topics include probability and counting rules, probability distributions, hypothesis testing, correlation, regression, chi-square, and analysis-of-variance. (Prerequisite: Minimum grade of C- in MAT 100 or level 2 or higher placement on the Math Placement Exam.)

MAT 125 Precalculus 4 credits

This course emphasizes functions and their applications. It starts with investigating graphs and solutions of the algebraic functions including polynomial, rational, and root functions. The course continues by exploring transcendental functions including exponential, logarithmic, and trigonometric functions. The course concludes with a study of conic sections. The course is a good preparation for Calculus and for those students who will encounter functions in their course of study. Students must earn a minimum grade of C- in this course to progress to the next level Math course. (Prerequisite: Minimum grade of C- in MAT 100 or level 2 or higher placement on the Math Placement Exam)

MAT 135 Calculus I 4 credits

This course explores the concepts of limit and continuity, investigates techniques of differentiation and its applications, introduces integration, and provides the framework for the Fundamental Theorem. (Prerequisite: Minimum grade of C- in MAT 125 or level 3 placement on the Math Placement Exam.)

MAT 146 Calculus II 4 credits

This course is a continuation of MAT 135. Topics covered include techniques of integration, an introduction to differential equations, sequences and series and applications of these concepts. Other topics include parametric equations, polar equations, and conic sections. Students will be introduced to a computer algebra system. (Prerequisite: Minimum grade of C- in MAT 135 or equivalent)

MAT 165 Quantitative Reasoning for Health Care Professionals 3 credits

This course is designed to meet the quantitative needs of students pursuing majors in health care. The course will include a review of essential math concepts needed for dosage calculation including: fractions, percentages, measurements, conversions, and ratios. This course will help students in applying basic mathematical concepts to real world situations. Dosage accuracy is highlighted in scenarios that employ critical thinking skills. The course will also include a basic introduction to the statistical concepts of mean, median, mode, standard deviation, and z-scores, with an emphasis on medical examples.

MAT 220 Discrete Mathematics 3 credits

This course serves as an introduction to formal proofs and is prerequisite for several upper level math courses. Additional topics covered include logic, set theory, function and relations. (Prerequisite: C- or better in MAT 135 or CSC 175 or CSS 180)

MAT 255 Calculus III 4 credits

This course is a continuation of Calculus II. Topics covered include analytic geometry in three-dimensional space, vector calculus, partial differentiation, multiple integration, the Fundamental Theorems, and related applications. (Prerequisite: Minimum grade of C- in MAT 146)

MAT 305 Foundations of Geometry 3 credits

This course provides a systematic survey of Euclidean, hyperbolic, transformation, and fractal geometries. Through the use of technology, the students are better enabled to construct, analyze, and prove conjectures. (Corequisite: MAT 220 or previous completion of MAT 220 with a minimum grade of C-)

MAT 333 Financial Mathematics 3 credits

Topics covered include the mathematical theory behind the time value of money, the force of interest, annuities, yield rates, amortization schedules, bonds, contracts, options, swaps, and arbitrage. This course also helps prepare students for the Financial Mathematics actuary exam. (Prerequisite: Minimum grade of C- in MAT 146).

MAT 335 Probability Theory 3 credits

Objectives include basic concepts of probability and discrete mathematics, discrete univariate distributions, and continuous univariate distributions. In addition, key concepts in discrete and continuous multivariate distributions, the distribution of order statistics for independent random variables, and linear combinations of independent random variables will be covered. (Corequisite: MAT 146)

MAT 340 Mathematical Statistics 3 credits

This course is a Calculus-based look at Statistics. Topics include sampling, parameter estimation, confidence intervals, hypothesis testing, inference using the normal and binomial distributions, goodness of fit, regression and correlation, and ANOVA. (Prerequisite: MAT 335)

MAT 375 Differential Equations and Linear Algebra 4 credits

This course is an overview of the concepts of differential equations and linear algebra necessary to solve applied problems. Topics include: Differential equations: separable, first-order linear, higher-order linear, linear systems with constant coefficients. Linear algebra: basis, dimension, matrices, eigenvalues/eigenvectors, and vector spaces. (Prerequisite: Minimum of C- in MAT 146)

MAT 450 Abstract Algebra 4 credits

This course is a rigorous introduction to abstract algebra. Topics include mappings, groups, equivalence relations, isomorphisms, rings, and fields. (Prerequisite: Minimum grade of C- in MAT 220)

MAT 478 Mathematics Seminar 3 credits

Students in this seminar will explore a variety of exciting mathematics problems. The course will be offered every spring but the topic will vary depending on the interests of the faculty member and the students. Students will sharpen their mathematical abilities by exploring an assortment of problem-solving strategies and clearly presenting generalized solutions. The opened-ended course number allows for more than one such experience. (Prerequisite: Minimum grade of C- in MAT 220 or consent of instructor)

MAT 488 Independent Study in Mathematics 1-4 credits

There are a plethora of topics in mathematics an advanced student could explore such as Difference Equations, Combinatorics, Graph Theory, Chaos Theory, Optimization, Operations Research, or Cryptography to name a few. The opened ended course number allows for more than one such experience. The student will work with a faculty mentor to choose an appropriate course, number of credits, and assessment scheme.

MAT 498 Mathematics Internship 1-16 credits

An exemplary real-world experience which allows for a deeper understanding of the mathematics used in a student's field of interest.