

MATHEMATICS (MATH)

MATH 100 Fundamentals of Mathematics 3

This course will develop numeracy. Selected concepts in mathematics include: Number Theory and the Real Number System, Algebraic Equations, Inequalities, Graphs, and Functions, Statistics, and Measurement. Minimum grade of C required to move on.

MATH 102 Foundations of Mathematics 3

This foundational college mathematics course is designed to equip students with essential problem-solving skills and a solid understanding of mathematical concepts applicable to real-world situations. Throughout the course, students will explore topics including proportions and variation, financial literacy, modeling, and data analysis. Practical applications are integrated throughout the curriculum, ensuring that students learn to use mathematical tools to make informed decisions and solve everyday problems.

MATH 103 Mathematical Ideas 3

The objectives of this course are to develop an appreciation for mathematics, to provide an insight into the methods of reasoning used by mathematicians, and to discuss its historical development. It is intended for the liberal arts student who has had little contact with mathematics, and elementary and secondary education majors.

Core Category: Mathematics

MATH 103L Mathematical Ideas Lab 1

The course reviews and reinforces concepts covered in MATH 103. This one-credit course provides students with tutoring and study skills to facilitate success as they develop an appreciation for mathematics and methods of reasoning used by mathematicians. It is intended for students that did not score 250 points in the Math Accuplacer after participating in the Esperanza College Bridge Program.

MATH 107 Mathematical Perspectives for Educators 3

This course will explore the fundamental concepts of Geometry and Algebra along with their historical development. Computer topics that are useful for educators will also be addressed along with the historical development of personal computers. It is intended for the student who intends to teach at the elementary or middle school level.

Core Category: Mathematics

MATH 108 Mathematical Perspectives for Science 3

MATH 130 Special Topics 1-3

MATH 140 College Algebra 3

This course will explore techniques for solving a variety of algebraic equations involving linear, quadratic, exponential, and logarithmic functions. These techniques will be used in solving problems involving the graphical and algebraic representation of quantitative data using these functions. In addition, inequalities and systems of equations will be studied. This course is intended for any student who is preparing to take Pre-calculus or any other course requiring these algebraic skills. NOTE: A student who has received credit for a higher level MATH course (exclusive of MATH 220 or an equivalent course in statistics for behavioral and social sciences) may not take this course for credit.

Core Category: Mathematics

MATH 150 Pre Calculus 3

An in-depth study of functions and graphical analysis. Polynomial, rational, trigonometric, inverse trigonometric, exponential and logarithmic functions will be studied. A student who has successfully taken calculus in high school may not take this course for credit

Core Category: Mathematics

MATH 160 Calculus I 3

This first semester calculus course will introduce concepts in the differentiation and integration of functions of one variable. These topics include limits, continuity, differentiation, integration, the mean value theorem and the fundamental theorem of calculus.

Core Category: Mathematics

MATH 161 Calculus II 3

This second semester calculus course continues the development of single variable calculus. Topics include applications of integration, integration techniques and an introduction to infinite sequences and series.

Prerequisites: MATH 160

MATH 214 Calculus III 3

This third semester calculus course introduces the concepts of three-dimensional space and calculus of several variables, including partial differentiation and multiple integrals.

Prerequisites: MATH 161

MATH 220 Elementary Statistics 3

Meaning, purposes and processes of statistical methods; selection of representative, parallel or equivalent groups; graphic representation; measures of central tendency; variability; normal distribution; probability; binomial coefficient; random sampling; confidence levels; interference; t-test, analysis of variance; chi square; correlation. Theory and practical application of above operations of computer where applicable. This course does not count toward the requirements for the major or minor in mathematics. Satisfies the quantitative reasoning general education requirement. Credit earned only once for BUSA 221, MATH 220, PSYC 220, or SOCI 220.

Core Category: Mathematics

MATH 221 Statistics for Data Analysis 3

Introduction to statistics with an emphasis on theory and application. Includes probability; sampling; t-test, analysis of variance; chi square; correlation; regression; effect size. Intended as an introduction for students meeting additional statistics, data science, or data analysis coursework. This course does not count toward the major or minor in mathematics.

Core Category: Mathematics

MATH 230 Special Topics 1-4

MATH 240 Discrete Mathematics 3

This course develops basic symbolic logic and proof techniques, and introduces students to discrete structures including sets, relations, functions, matrices and graphs. Also includes an introduction to combinatorics and other mathematical topics related to the study of computer science.

Core Category: Mathematics

MATH 244 Linear Algebra 3

An introductory course in linear algebra. Topics include linear equations, matrices, determinants, eigenvalues, linear transformations and vector spaces.

Core Category: Mathematics

MATH 300 Differential Equations 3

A study of first-order and linear differential equations, linear systems and Laplace transforms.

Prerequisites: MATH 161

MATH 310 Number Theory 3

An introduction to elementary number theory and its applications, particularly in the field of cryptography.

Prerequisites: MATH 240

MATH 315 Probability 3

This course is a rigorous introduction to the field of probability. It will cover the mathematical theory of probability, and applications of the theory to a variety of real-world problems.

Prerequisites: MATH 161 and MATH 240

MATH 316 Mathematical Statistics 3

A calculus - based introduction to mathematical statistics and the statistical programming language R. A study of the mathematical foundations of statistical methods, and the application of these methods using the programming language R. Covers data analysis using R, random variables and distributions, estimation, hypothesis testing, linear regression. Prerequisite: MATH 315

Prerequisites: MATH 315

MATH 330 Special Topics 1-4**MATH 330G Partial Differential Equations 3****MATH 330I Graph Theory 3**

This course is an introduction to graph theory. Topics include graphs, trees, cycles, Eulerian cycles, shortest path algorithm and spanning tree algorithm.

MATH 330J SpTop: Game Theory 3

An introduction to the mathematical field of Game Theory. The course will provide an introduction to both Combinatorial Game Theory (covering strategy and Zermelo's Theorem) and classical game theory (covering matrix games, zero-sum games, and the Nash equilibrium).

MATH 335 Scientific Computing 3

This is an introductory course designed to familiarize the student with methods of scientific computing. We will do this through the use of many examples, some theory and homework problems. Along the way we will learn about the computational tools MatLab and Mathematica.

Prerequisites: MATH 244

Corequisites: MATH 300 can also be taken as a prerequisite

MATH 340 Geometry 3

A study of Euclidean and hyperbolic geometry. The postulates and principal definitions and theorems of these two geometries will be studied and compared. Other non-Euclidean geometries will also be introduced.

MATH 350 Advanced Calculus 3

A rigorous development of multivariable calculus and vector analysis. Topics include Green's, Stokes' and Gauss' theorems; vector fields; transformations and mappings.

Prerequisites: MATH 240

MATH 380 Chaotic Dynamical Systems 3

This course will explore discrete dynamical systems, including orbits, graphical analysis, fixed point methods, bifurcation, the quadratic family and chaos.

Prerequisites: MATH 240

MATH 400 Directed Study 1-4**MATH 404W Real Analysis 3**

This course provides an axiomatic construction of the real number system. Topics include sequences, Cauchy sequences, metric spaces, topology of the real line, continuity, completeness, connectedness and compactness, convergence and uniform convergence of functions, Riemann integration. Writing-intensive course.

Prerequisites: MATH 350

MATH 414W Abstract Algebra 3

The properties of formal systems such as groups, rings, and fields. The approach is axiomatic. Writing-intensive course.

Prerequisites: MATH 240

MATH 415 Topology 3

This course provides a basic introduction to the definitions and concepts of point set topology, and a brief introduction to algebraic topology (homotopy and the fundamental group).

Prerequisites: MATH 240

MATH 422 Foundations and Philosophy of Mathematics 3

This culminating senior experience course in the mathematics major provides an introduction to mathematical philosophy with a consideration of the logical foundations of mathematics, its culture and practices. Also includes a development of the number systems. A broad review of mathematics will be done in preparation for the ETS Major Field test.

MATH 430 Directed Study 1-3**MATH 495 Internship 1-12****MATH 498 Teaching Assistant 1-3****MATH 499 Research Assistant 1-3**