

Mathematics (MATH)

Courses

MATH 0010 Mathematics Basics Lab: 0 semester hours.

This course is designed to improve the student skills involving basic arithmetic computations to include integers, fractions, decimals, and percents. There will be a strong emphasis on solving and graphing linear equations as well as basic polynomial manipulations.

MATH 0021 Mathematics Non-course Based Option I: 0 semester hours.

This non-course based option is designed to provide individualized developmental mathematics instructions to students who did not successfully complete MATH 0313.

Prerequisites: MATH 0313 or MATH 0133.

MATH 0030 Comp Math Skills: 0 semester hours.

This course will enhance the student's performance in college level mathematics. It improves skills in solving quadratic equations, manipulating polynomials, radicals and exponential expressions. It develops a basic understanding of the mathematical functions and concepts necessary for successfully completing the college level course.

Prerequisites: TSI Math with a score of 347.

Co-requisites: MATH 1314, MATH 1332, PSYC 2317.

MATH 0132 Comprehensive Math Skills for Contemporary Algebra: 1 semester hour.

This course will enhance the student's performance in Contemporary College Algebra. It improves skills in solving linear and power equations, manipulating polynomial and exponential expressions, and graphing and interpreting two-variable equations. It develops an understanding of numeracy and the real number system; and the basic mathematical functions and concepts necessary for successfully completing the Contemporary College Algebra course. A co-requisite course for those students who have not passed TSIA Math, to be taken in conjunction with Contemporary College Algebra.

Co-requisite: MATH 1332.

MATH 0135 Comprehensive Math Skills for College Algebra: 1 semester hour.

This course will enhance the student's performance in College Algebra. It improves skills in solving quadratic equations, manipulating polynomials, radicals and exponential expressions. It develops a basic understanding of the mathematical functions and concepts necessary for successfully completing the College Algebra course. A co-requisite course for those students who have not passed TSIA Math, to be taken in conjunction with College Algebra.

Co-requisite: MATH 1314.

MATH 0311 Comprehensive Math Skills for College Algebra: 3 semester hours.

This course is designed to present a careful and guided review of the basic mathematical concepts to improve and strengthen the student fundamental understanding of mathematics. The topics will include solving and graphing linear equations and inequalities, solving linear systems, determining the equation of a line and slope of lines. The course will also cover manipulation of polynomials to include factoring, ratios, solving rational equations and geometric applications.

Prerequisites: MATH 0010 or MATH 0100 or TSI Math with a score of 336.

Co-requisite: MATH 1314.

MATH 0312 Basic Math II: 3 semester hours.

This course is an introductory course to Algebra designed to make the transition to College Algebra more successful. It provides the student with background knowledge in fundamental algebra and skills in mathematics. It will concentrate on developing skills in solving and graphing linear equations, simplifying and factoring polynomials, solving quadratic equations and combining and simplifying rational expressions and exponents.

MATH 0313 Pre-Algebra: 3 semester hours.

This course is designed to make the transition to College Algebra more successful. Topics include advanced algebraic operations, factoring with an emphasis on rational, radical, and quadratic equations. Students will be introduced to functions with emphasis on function evaluation, graphs, composition, and inverse.

Prerequisites: MATH 0311 or MATH 0113 or (TSI Math with a score of 336 and TSI DIAG ElemAlg with a score of 06).

MATH 1314 College Algebra: 3 semester hours.

Linear and quadratic equations, inequalities, functions (quadratic, polynomials, and rational) and graphs of functions, exponential and logarithmic functions, systems of linear equations. Cannot receive credit for both MATH 1332/1103 and MATH 1314/1113. (Prerequisite: Student must have TSIA math score of 350. In the case the student has a TSIA math score of 347-349, he/she must enroll in Math 0300, as corequisite.

MATH 1316 Trigonometry: 3 semester hours.

Trigonometric functions, radian, logarithms, functions of composite angles, identities, and trigonometric equations.

Prerequisites: MATH 1314 or MATH 1113.

MATH 1324 Finite Mathematics: 3 semester hours.

Linear equations and applications, linear forms and system of equations, matrix algebra and applications, linear programming (linear and simplex method), probability and applications, statistics.

Prerequisites: (MATH 1314 or MATH 1113) or (MATH 1332 or MATH 1103) or (MATH 1511 or MATH 1115).

MATH 1325 Calculus-Business, Life and Social Sciences: 3 semester hours.

Derivatives, curves, sketching, and optimization techniques for differentiation. Logarithms and exponential functions with applications, integral techniques and application of integrals, and multivariate calculus.

Prerequisites: MATH 1324 or MATH 1153.

MATH 1332 Contemporary College Algebra: 3 semester hours.

Intended for Non STEM (Science, Technology, Engineering, and Mathematics) majors. Topics include introductory treatments of sets and logic, financial mathematics, probability and statistics with appropriate applications. Number sense, proportional reasoning, estimation, technology, and communication should be embedded throughout the course. Additional topics may be covered. Cannot receive credit for both MATH 1332/1103 and MATH 1314/1113.

MATH 1342 Elementary Statistics: 3 semester hours.

An introduction to the concepts and methods of statistics, topics including probability, random variables, binomial and normal distributions, random sampling, statistical inference, estimation, testing hypothesis, linear regressions and correlation, problem solving, chi-square test and categorical data, and analysis of variance.

Prerequisites: (MATH 1314 or MATH 1113) or (MATH 1332 or MATH 1103) or (MATH 1511 or MATH 1115).

MATH 1511 College Algebra and Trigonometry: 5 semester hours.

A basic course in mathematics for students needing additional pre-calculus skills, including college algebra and trigonometry. Topics included are linear, quadratic, and higher degree polynomial functions and identities, determinants and systems of linear equations, inverse trigonometric functions, and trigonometric equations.

MATH 2305 Discrete Mathematics: 3 semester hours.

Designed to provide a bridge between computational mathematics and theoretical mathematics. Topics include induction and recursion, combinatorics, graph theory functions, proofs and logic.

Prerequisites: MATH 2413 or MATH 1124.

MATH 2316 Structure of Number System: 3 semester hours.

A logical approach to elementary mathematics, with emphasis on the powers and techniques of the axiomatic approach in mathematics. Topics include sets, logic, number theory, equivalence relations and mathematical proofs in developing the characteristics of number systems.

Prerequisites: (MATH 1314 or MATH 1113) or (MATH 1332 or MATH 1103).

MATH 2318 Informal Geometry: 3 semester hours.

A brief development of finite geometric systems from an advanced standpoint, with attention given to intuition and didactics. Topics include deductive reasoning, metric and non-metric geometry, transformational geometry, topological notions, graphs, and networks.

Prerequisites: (MATH 1314 or MATH 1113) or (MATH 1332 or MATH 1103).

MATH 2320 Differential Equations: 3 semester hours.

Ordinary differential equations with emphasis on first-order linear and higher order ordinary differential equations with constant coefficients and some non-constant coefficients. Applications.

Prerequisites: MATH 2414 or MATH 2024.

MATH 2413 Calculus with Analytic Geometry I: 4 semester hours.

Functions and graphs, limits and continuity, derivatives of functions, Mean Value Theorem, applications of derivatives. Fundamental Theorem of Calculus and applications of integrals.

Prerequisites: ((MATH 1113 or MATH 1314) and (MATH 1123 or MATH 1316)) or MATH 1115 or MATH 1511.

MATH 2414 Calculus with Analytic Geometry II: 4 semester hours.

Applications of integrals, integration techniques, inverse functions, indeterminate forms, improper integrals, parametric equations, polar coordinates, infinite series, power series, Taylor series.

Prerequisites: MATH 2413 or MATH 1124.

MATH 3300 Mathematics in Elementary Schools: 3 semester hours.

A conceptual approach to introducing mathematics concepts and the integrating of content, pedagogy and assessment which include treatments of the nature of selective pre-algebra and discrete topics and the use of EC-4/4-8 TEKS Standards V-VI.

Prerequisites: MATH 2316 or MATH 2163.

MATH 3301 Modern Algebra: 3 semester hours.

Number theory, groups, rings, integral domains, and fields.

Prerequisites: MATH 2305 or MATH 2053.

MATH 3302 Probability and Statistics: 3 semester hours.

Counting problems, probability theory infinite sample spaces, random numbers and their usage, random variables, expectations, means, variances, binomial and normal distributions, random walk problems, point estimation, confidence limits, hypothesis testing, applications of Bayes' Theorem, sums of independent random variables, law of large numbers, and central limit theorem.

Prerequisites: MATH 2414 or MATH 2024.

MATH 3307 Linear Algebra: 3 semester hours.

Systems of linear equations, matrices, real vector spaces, linear transformations, change of bases, determinants, eigenvalues and eigenvectors, diagonalization and inner product spaces.

Prerequisites: MATH 2414 or MATH 2024.

MATH 3310 History of Mathematics: 3 semester hours.

The development of mathematical thought from ancient time to the present. Contributions by the great Greek, Roman, and German mathematicians, as well as by others.

Prerequisites: (MATH 2413 or MATH 1124) or (MATH 1325 or MATH 2153).

MATH 3316 Mathematics Understanding: 3 semester hours.

Basic concepts underlying algebra, geometry, trigonometry and calculus, mathematics problem solving and critical thinking assessments, mathematical concepts leading to vertically connected tasks that demonstrate how to build and connect mathematics tasks across teacher certification EC-6 and 4-8.

Prerequisites: MATH 2316 or MATH 2163.

MATH 3319 Introduction to MATLAB and PHYTHON: 3 semester hours.

Introduces the basic concepts of programming and problem-solving using MATLAB and Python. Topics include data types, data input/output, control structures, functions, scripts, debugging, data visualization techniques, and symbolic computation, data simulation, and basic algorithms. Programming projects related to mathematical and statistical applications and elementary numerical methods.

Prerequisites: MATH 2413 or MATH 1124.

MATH 3361 Intro Biostatistics: 3 semester hours.

Descriptive statistics, data presentation, counting techniques, probability theory concepts, application of Bayes' theorem, random numbers, random variables, discrete and continuous random variables, binomial distribution, Poisson distribution, multinomial distribution, normal distribution, exponential distribution, lognormal distribution, the central limit theorem, covariance, correlation, point and interval estimation, hypothesis testing, p-values, simple linear regression, analysis of categorical data, applications in biology and biomedicine.

Prerequisites: MATH 2413 or MATH 1124.

MATH 3401 Calculus III: 4 semester hours.

Calculus of functions of several variables, calculus of vector valued functions, partial differentiation, multiple integrals.

Prerequisites: MATH 2414 or MATH 2024.

MATH 3568 Math for Engineers: 5 semester hours.

Matrices are determinants, Vector Spaces, Eigenvalues and Eigenvectors, Power Series, Laplace Transform, Fourier Series and Orthogonal Functions; Multivariate Functions: Sample Space, Random Variables, Probability Distributions, Moments of a Random Variable, Sum of Independent Variables, Conditional Probability, Law of Large Numbers, Central limit Theorem, Inference Concerning Means, Variances and proportions, Analysis of Variance, Statistical Content of Quality Improvement Programs, Reliability, Probabilistic Description of Stochastic Processes, Poisson Process, Simple Queuing Models in Engineering.

Prerequisites: MATH 2320 or MATH 2043.

MATH 3599 Independent Study: 1-5 semester hour.

Reading, research, and or field work on selected topics.

MATH 4100 Mathematics Colloquium: 1 semester hour.

Detailed reports on selected topics in both theoretical and applied mathematics. Mathematics majors are required to report individually on at least one topic of a moderate degree of difficulty as a demonstration of their resourcefulness, ability, and achievement in the field of mathematics.

MATH 4190 LaTeX for Mathematics and Science: 1 semester hour.

1 semester hour. This course is an introduction to the LaTeX software system, which is used for document preparation in mathematics, science, and engineering. Students will learn how to use LaTeX to typeset documents such as homework, articles, presentation slides, and an academic poster. Students will develop enough familiarity with LaTeX so that they are able to prepare many technical documents.

Prerequisites: MATH 2413 or MATH 1124.

MATH 4300 Mathematics Modeling and Applications: 3 semester hours.

Models for teaching and learning mathematics, which includes an integration of content, problem solving strategies, real world applications and use of technology.

Prerequisites: MATH 1316 or MATH 1123.

MATH 4305 Mathematics Teaching Capstone Course: 3 semester hours.

The course summarizes, evaluates and integrates college mathematics experiences and provides reviews of mathematical skills. Students must demonstrate that they have mastered their academic program goals.

MATH 4306 Numerical Analysis: 3 semester hours.

Linear and nonlinear systems, matrix inversions and eigenvalues, polynomial approximations, quadrature interpolation, least square, finite differences, including analyses of algorithms and solutions utilizing numerical methods.

Prerequisites: (MATH 3307 or MATH 3073) and (COMP 1315 or COMP 1013).

MATH 4308 Advanced Calculus I: 3 semester hours.

Number sequences, limits, sequential functions, properties of continuous functions, and mean value theorem and Riemann Integral.

Prerequisites: MATH 2320 or MATH 2043 and (MATH 3401 or MATH 3014).

MATH 4317 Advanced Math for Engineers: 3 semester hours.

Matrices and determinants, vector spaces, systems of linear equations, eigenvalues and eigenvectors, power series, Laplace transforms, Fourier series and orthogonal functions, numerical solutions to ordinary differential equations.

Prerequisites: MATH 2320 or MATH 2043.

MATH 4389 Mathematics Capstone Course: 3 semester hours.

This course is designed to ascertain that the mathematics major is proficient in the majority of the major requirements such as the Calculus sequence, Differential Equations, Linear Algebra, Abstract/Modern Algebra, Advanced Calculus, Probability, Statistics, and Numerical Analysis. Students will participate in class discussion, write summaries of readings, do group solving, give oral presentations, submit mini projects and complete a major project. This course will provide an integrated experience of the student's program. Its intensity will enhance the student's chances of success in the required major field test.

MATH 4599 Independent Study: 1-5 semester hour.

Reading, research, and/or field work on selected topics.

MATH 5399 Independent Study: 3 semester hours.

Course description will vary according to course chosen for independent study.