

MATH (MATH)

MATH 001 DEVELOPMENTAL MATHEMATICS (3 Hours)

This course is designed to improve the students' mastery of the fundamental operations of arithmetic, including whole numbers, fractions, decimals, mixed numbers and percentages. Emphasis is placed on number manipulation and applications relating to process.

MATH 002 BASIC CONCEPTS/N MATH II (3 Hours)

MATH 003 INTEGRATED INTERMEDIATE ALGEBRA (3 Hours)

MATH 103 College Algebra with Corequisite Support (3 Hours)

This course is a corequisite Math course in which the Intermediate Math course is coupled with the credit-bearing College Algebra course (IHL Policy 608E). Students will engage in extra time for mandatory labs and tutoring to help them master the content necessary to successfully complete MATH 103. Upon successfully completing this course, students will receive credit for the Intermediate Math and the College Algebra course. The course will consist of an accelerated refresher on linear equations and inequalities and their graphs, absolute value equations and inequalities, exponents, and polynomials, factoring, rational expressions, radicals, and quadratic equations; followed by an analysis of graphs and functions; polynomial functions; rational, power, and root functions; inverse, exponential, and logarithmic functions with integrated refresher content as necessary.

MATH 111 COLLEGE ALGEBRA (3 Hours)

Prerequisite: MATH 004 with a grade of $\geq C$ or better or the equivalent and Test Standing.

The function concepts, solving quadratic equations, graphing the quadratic function, inequalities, absolute value, absolute inequalities, Fundamentals theorem of Algebra, roots, factors, systems of equations and matrices, math induction and Binomial Theorem, arithmetic and geometric progressions, logarithms, complex numbers, partial fractions, and applications of all topics.

MATH 112 PLANE TRIGONOMETRY (3 Hours)

Prerequisite: MATH 111 with a grade of $\geq C$ or better.

Right and oblique triangular solutions, identities, trigonometric equations, systems of angular measurements, and applications.

MATH 114 Quantitative Reasoning (3 Hours)

Prerequisite: Test Standing

MATH 113 (3) Quantitative Reasoning. Quantitative Reasoning is a general education course designed for students in non-STEM degree pathways. The course empowers students' reasoning with data in relation to real-life situations, arts, health, science, and social issues. It enhances critical thinking and quantitative literacy while developing awareness about rules or principles guiding the understanding and evaluation of real-life problems. It is designed to teach students a wide range of general mathematics. Problem-solving and critical thinking skills, along with the use of technology, will be emphasized and reinforced throughout the course in solving applied problems. Topics include: algebra, concepts of set theory, modeling, geometry, measurement, probability, statistics, simple regression analysis, and making predictions with data.

MATH 118 ALGEBRA II & TRIGONOMETRY (5 Hours)

Prerequisite: Test Standing, MATH 004 or equivalent.

Polynomial equations, exponents and radicals, logarithms, quadratic equations, inequalities, complex numbers, permutations and combinations, probability, determinants, simultaneous linear equations, induction, binomial theorem, progressions and series, triangular solutions, identities, trigonometric equations, systems of angular measurement applications.

MATH 217 INTRODUCTORY FINITE MATH (3 Hours)

Prerequisite: MATH 111.

Introductory ideas for students of education, compound statements, sets and subsets, partitions and counting, elementary probability theory.

MATH 221 CALCULUS I INDUST OR BUS (3 Hours)

Prerequisite: MATH 111.

Functions, limits, continuity, differentiation, applications, basic analytic geometry, algebraic, exponential and logarithmic functions, integration, applications, series and sequences, improper integral. Specific applications.

MATH 226 CONCEPTS & STRUCS OF MATH I (3 Hours)

Prerequisite: MATH 111 with a grade of $\geq C$ or better.

Study of various numeration systems, rational and real numbers, fraction and decimal algorithms, ratios, percentages, consumer mathematics, introduction to problem-solving and logic, use of patterns and Venn diagrams.

MATH 241 CALCULUS I WITH LABORATORY (3 Hours)

Functions, limits, continuity, differentiation, limiting forms, applications, properties of continuous functions, analytical geometry and integration. The laboratory component is designed to reinforce the lecture component with activities requiring the use of technology in the form of computers with selected software and graphing utilities.

MATH 242 CALCULUS II WITH LABORATORY (3 Hours)

MATH 243 CALCULUS III WITH LABORATORY (3 Hours)

Infinite Sequences and Series, Tests of Convergence or Divergency, Power Series, Vectors and the Geometry of Space, Vector Valued- Functions, Partial Derivatives: Chain rule, Directional Derivatives, Gradient, Tangent Planes and Differentials. The laboratory component is designed to reinforce the lecture component with activities requiring the use of technology in the form of computers with selected software and graphing utilities.

MATH 244 CALCULUS IV WITH LABORATORY (3 Hours)

Continuation of Functions of several variables and partial differentiation; multiple integrals, vector calculus and integration in vector fields. The laboratory component is designed to reinforce the lecture component with activities requiring the use of technology in the form of computers with selective software and graphing utilities.

MATH 271 ELEMENTARY STATISTICS I (3 Hours)

Prerequisite: MATH 112.

Introduction, frequency distributions, location measures, variation, symmetry, skewness, peakedness, index numbers, probability, theoretical distributions, sampling, estimation, tests of hypotheses, non-parametric tests, linear regression, coefficient of correlation, time series analysts.

MATH 303 INT TO SET THEO & LOGC I (3 Hours)

Prerequisite: MATH 231, with a grade of $\geq C$ or better.

Sets and relations, natural number sequence, extension of natural number to reals, logic, informal axiomatics, Boolean algebra, interval and set theory, algebraic theories, first order theories.

MATH 306 ELEMENTARY CONCEPTS OF GEOMETR (3 Hours)

Prerequisite: Department approval.

Basic notions of lines, angles, triangles, circles and proofs. Stress is placed on synthetic methodology and reasoning.

MATH 307 PROBLTY & STATISTICS/ENGINEERG (3 Hours)

Prerequisite: MATH 232.

Introduction to concepts of probability and statistics required to solve problems in various disciplines; mathematical basis for probability and statistics includes axioms of probability, continuous sampling distributions, and discrete probability, hypothesis testing, confidence intervals, probability estimations for risk assessment, data processing and statistical inference, statistical techniques of data analysis, simple and multiple regression model development; stochastic processes, emphasis is on the application of probability, statistics and reliability to rational decision making, data analysis and model estimation in engineering context.

MATH 311 ABSTRACT ALGEBRA I (3 Hours)

Prerequisite: MATH 303.

Basic concepts of modern algebra, preliminaries, elementary ideas of groups, rings, integral domains and fields.

MATH 321 MODERN GEOMETRY I (3 Hours)

Prerequisite: MATH 232.

Euclidean, non-Euclidean, projective and affine geometrics with emphasis on the appropriate postulates and the postulational method. Transformation theory.

MATH 331 LINEAR ALGEBRA & MATRIX THEORY (3 Hours)

Prerequisite: MATH 303.

A theoretical study of equations, matrices, vector spaces, inner product spaces linear transformations bilinear and quadratic forms, and eigenvalues.

MATH 351 ADVANCED CALCULUS I (3 Hours)

Prerequisite: MATH 233.

Sets and functions, continuity, integration, convergence, differentiation, and applications to geometry and analysis, differential geometry, and vector calculus.

MATH 355 PROBABILITY&STATISTICS I (3 Hours)

Prerequisite: MATH 233.

Random variables, conditional probability and stochastic independence, special distributions.

MATH 356 PROBABILITY & STATS II (3 Hours)

Prerequisite: MATH 355.

Estimations, order statistics, limiting distributions, statistical hypotheses, variance, normal distribution theory, point and interval estimation, sampling, regression and correlation.

MATH 368 DIFFERENTIAL EQUATIONS (3 Hours)

Prerequisite: MATH 233.

Introduction to differential equations, first-order differential equations, higher-order differential equations, series solutions of linear equations, the Laplace transform and systems of linear first-order differential equations.

MATH 399 PROBLM SLVG FOR PRE S MATH TEA (0 Hours)

This course includes topics pertinent to success in problem solving for Secondary Mathematics Education majors: arithmetic and basic algebra, geometry, trigonometry, analytic geometry, functions and their graphs, calculus, probability and statistics, discrete mathematics, linear algebra, computer science, and mathematical reasoning and modeling. In addition to review of content that pertains to the aforementioned topics, students will investigate test taking skills and methods of problem solving. Underlying focus will be to develop students' mathematical communication skills through regular class participation and peer evaluation activities.

MATH 402 MTHDS OF TCHNG MATH IN SECD SC (3 Hours)

Prerequisite: Department approval.

Materials and sources of value to prospective teachers of high school, middle school and junior high school mathematics, reports, current articles, state-adopted textbooks, yearbooks and histories, special problems in teaching geometry and algebra.

MATH 403 SEMINAR IN MATHEMATICS (3 Hours)

Prerequisite: Department approval.

The provisions to the student of an opportunity to discuss pertinent trends and ideas in mathematics, and to evaluate the experience he has had through study and practice during his previous years of training in mathematics.

MATH 404 NMBR THEORY&CRYPTOGRAPHY (3 Hours)

Prerequisite: MATH 331 or department approval.

Topics in elementary number theory, finite fields, and quadratic residues. Cryptography public key, primality and factoring, elliptic curves.

MATH 411 ABSTRACT ALGEBRA II (3 Hours)

Prerequisite: MATH 311.

Groups rings, integral domains, modules, vector spaces, fields, linear transformations, special topics in group, ring, and field theory.

MATH 415 PARTIAL DIFF EQUATIONS I (3 Hours)

Prerequisite: MATH 368.

Heat equations, Laplace's equation, Fourier series, wave equation, Sturm-Liouville eigenvalue problems, nonhomogeneous problems, method of Green's functions, infinite domain problems and the methods of characteristics for wave equations.

MATH 431 REAL ANALYSIS I (3 Hours)

Prerequisite: MATH 233.

Real number system, basics, numerical sequences and series, continuity, differentiation, Reimann-Stieltjes integral, sequences and series of functions, special series, functions of several variables, the Lebesgue theory.

MATH 435 THE TEACHING OF MATHEMATICS (3 Hours)

Prerequisite: Department approval.

Theory of arithmetical meanings, learning and rational, applied meanings, current trends.

MATH 436 TEACHNG OF ARITHMETIC II (3 Hours)**MATH 441 COMPLEX ANALYSIS I (3 Hours)**

Prerequisite: MATH 233.

Complex numbers and representations, point sets, sequences, functions, analytic functions of one complex variable, elementary functions, integration, power series, calculus of residues, conformal representation, applications.

MATH 451 GENERAL TOPOLOGY I (3 Hours)

Prerequisite: MATH 303.

Elementary set theory, ordinals and cardinals, topological spaces, cartesian products, connectedness, special topologies, separation and covering axioms, metric spaces, convergence, compactness, function spaces, compete spaces, elementary homotopy and homology theory.

MATH 466 OPERATIONS RESEARCH (3 Hours)

Prerequisite: MATH 355.

Learning programming, network analysis, PERT-CPM, dynamic programming, queuing theory and decision analysis.

MATH 493 HIST IN MATH CLASSROOM I (3 Hours)

Prerequisite: Department approval.

Historical development of numbers and numerals, computation, geometry, algebra, trigonometry, calculus, modern mathematics.