COURSE DESCRIPTIONS

MATH 111 COLLEGE ALGEBRA (3 units) - The course covers the real number system, algebraic expressions, the one- and two- dimensional coordinate systems, functions, equations and inequalities, word problems, and variation and progressions.

MATH 112 TRIGONOMETRY (3 units) - This course covers circular functions, circular functions identities, solutions of equations involving circular functions, inverse circular functions, circular functions of angles, and applications of circular functions.

Corequisite: College Algebra

MATH 114 INDUSTRIAL MATH (3 units) - Practical mathematics applied to technical and trade work. The course considers the following topics: practical algebra, rectangles and triangles, regular polygons and circles, geometric solids, metric triangles, regular polygons and circles, geometric solids, metric measure, graphs, measuring instruments, and geometrical construction. It also includes a practical approach to mathematics in everyday problems of operating a small business as computing a profit and loss statement and computing of estimates, bids, and contracts.

MATH 116 FUNDAMENTAL CONCEPTS OF MATHEMATICS (3 units) - This course covers sets, principles of logic, methods of proof, relations, functions, integers, binary operations, complex numbers, matrices and matrix operations, and an introduction to mathematical systems.

Prerequisite: Precalculus Mathematics II

MATH 121 STATISTICS (3 units) - This course is an introduction to statistics and data analysis. It covers the following: reasons for doing Statistics, collection, summarization and presentation of data, basic concepts in probability, point and interval estimation, and hypothesis testing.

MATH 122 ANALYTIC GEOMETRY (3 units) - Analytic Geometry deals with analytic geometry of a line and plane; algebraic functions of one variable and their graphs; composition and inverse of functions; absolute values and inequalities; and an in-depth study of conic section.

Pre-requisite: Trigonometry

MATH 125 FUNDAMENTALS OF COMPUTING I (3 units) - This course introduces fundamental programming constructs: types, control structures, functions, I/O, basic data structures using the C programming language. In-class lectures and discussions are supplemented by computer hands-on sessions.

MATH 126 FUNDAMENTALS OF COMPUTING II (3 units) - This course covers advanced programming concepts and techniques using Java, C++ or other suitable object-oriented programming languages. Topics include recursion, abstract data types, advanced path structures, programming interfaces, object-oriented programming, inheritance, polymorphism, event handling, exception handling, API programming. In-class lectures and discussions are supplemented by computer hands-on sessions.

Pre-requisite: Fundamentals of Computing I

MATH 211 PLANE AND SOLID GEOMETRY (3 units) - This is a comprehensive course in the study of Euclidean Geometry of plane and solid. The course covers theorems and proofs, their application in relation to points, lines, planes, triangles, parallelograms, circles, spheres, prism, pyramids, cones, cylinders, and polyhedron. Considerable attention is given in helping students understand the nature of deductive proof.

MATH 213 CALCULUS I (3 units) - This course is an introduction to calculus. It covers special, functions, limits, continuity, derivatives and their applications and differentials.

Prerequisite: Analytic Geometry

MATH 216 NUMBER THEORY (3 units) - This course covers integers and divisibility, congruences, linear Diophantine equations, residues, number theoretic functions, primitive roots, quadratic residues, quadratic reciprocity law, and the Legendre symbol.

MATH 218 DISCRETE MATHEMATICS (3 units) - This is a course that covers the fundamentals of logic and sets, the fundamental principles of counting, algorithms and some concepts in graph theory.

Prerequisite: Precalculus Mathematics II

MATH 221 LINEAR ALGEBRA (3 units) - This course covers matrices, systems of linear equations, vector spaces, linear independence, linear transformations, determinants, eigenvalues and eigenvectors, diagonalization, and inner product spaces.

Prerequisite: Fundamental Concepts of Mathematics

MATH 224 CALCULUS II (3 units) - This course covers antiderivatives, definite integrals and their applications, the derivatives and integrals of transcendental functions, and techniques of integration.

Prerequisite: Calculus I

MATH 226 NUMERICAL ANALYSIS (3 units) - This is an introductory course that covers error analysis, solutions of linear and nonlinear equations, numerical integration and differentiation, and numerical solutions of ordinary differential equations. In-class lectures and discussions are supplemented by computer hands-on sessions.

Prerequisites: Differential Equations I, and Linear Algebra

MATH 236 GRAPH THEORY AND ITS APPLICATIONS (3 units) - This course is an introduction to concept in graph theory, networks, graph algorithms and their applications.

Prerequisite: Discrete Mathematics

MATH 311 DIFFERENTIAL EQUATIONS I (3 units) - This is an introductory course in ordinary differential equations (ODEs). It focuses primarily on techniques for finding explicit solutions to linear ODEs. Topics include first order ordinary differential equations, linear differential equations, linear equations with constant coefficients, nonhomogeneous equations, undetermined coefficients and variation of parameters, linear systems of equations; the existence and uniqueness of solutions.

Prerequisite: Calculus III

MATH 313 CALCULUS III (3 units) - This course covers approximations of definite integrals, polar coordinate system, vectors and curves, surfaces in 3-dimensional space, calculus of functions of several variables, sequences, infinite series and power series.

Prerequisite: Calculus I and II

MATH 316 STATISTICAL THEORY (3 units) - This course focuses on the basic theory of statistical inference. It covers basic random sampling, sampling distributions, point and interval estimation, and hypothesis testing.

Prerequisites: Statistics, and Probability

MATH 317 PROBABILITY (3 units) - This is an introductory course in probability covering axiomatic probability space, discrete and continuous random variables, special distributions, mathematical expectation, conditional probability and independence, multivariate distributions, Laws of Large Numbers, and the Central Limit Theorem.

Corequisite: Calculus III

MATH 319 PROBABILITY AND STATISTICS (3 units) - This course is intended to provide an introduction to probability and statistics with application. Gaussian function serves as the main focus the study of distribution topics include are basic probability models, random variables, discrete and continuous probability distribution statistical estimation, confidence internal simple linear regression.

MATH 321 ABSTRACT ALGEBRA I (units) - This course covers groups, subgroups, cyclic groups, permutation groups, abelian groups, normal subgroups, quotient groups and homomorphisms and isomorphism theorems, rings, integral domains, fields, ring homomorphisms, ideals, and field of quotients.

Prerequisite: Fundamental Concepts of Mathematics

MATH 322 ABSTRACT ALGEBRA II (3 units) - This course covers rings of polynomials, fundamental theorem of field theory, extension fields, algebraic extensions, finite fields, geometric constructions, fundamental theorem of Galois Theory, illustrations of Galois Theory.

Prerequisite: Abstract Algebra I

MATH 326 TIME SERIES ANALYSIS (3 units) - This course deals with different methods of forecasting stationary and non-stationary time series data. The theoretical and model building issues of classical smoothing techniques, seasonal decomposition, and the use of Univariate Box-Jenkins statistical models are discussed. Other modern statistical models, such as ARCH, GARCH, transfer function, vector auto regression are also illustrated. In-class lectures and discussions are supplemented by computer hands-on sessions with statistical software.

Prerequisites: Statistics, Probability, and Statistical Theory

MATH 327 DIFFERENTIAL EQUATIONS II (3 units) - This course covers irst-order linear partial differential equations, initial and boundary conditions, the wave equation, the diffusion (heat) equation, boundary problems, Fourier series solutions, and Laplace's equation.

Prerequisites: Differential Equations I, and Advanced Calculus I

MATH 328 MODERN GEOMETRY (3 units) - The first part of the course focuses on Euclidean and affine geometry on the plane. The second half may continue with Euclidean geometry on the sphere; alternatively, an introduction to finite geometries and to the non-Euclidean hyperbolic and elliptic geometries may be given. This course interrelates and makes use of tools from Geometry, Linear Algebra and Abstract Algebra.

Prerequisites: Linear Algebra, and Abstract Algebra I

MATH 361 ENGINEERING MATHEMATICS I (3 units) - Integral Calculus applications such as plane areas, volume of solids of revolution, centroids of plane areas, centroids of solids of revolution, moment of inertia, work, force, improper integrals, multiples integral series.

Prerequisites: Calculus I and Calculus II

MATH 362 ENGINEERING MATHEMATICS II (3 units) - This course aims to equip students with knowledge in differential equations as applied to engineering problems. Topics are ordinary differential equations, Laplace Transforms, non-linear equation, series solutions near ordinary point, introduction to partial differential equations and Fourier series.

Prerequisites: Calculus I and Calculus II

MATH 363 ENGINEERING MATHEMATICS III (3 units) - This course covers complex numbers, power series expansion, Fourier series, Fourier transform, Laplace transform, Hilbert transform, z-transform, complex variables, random variables, stochastic processes.

Prerequisites: Engineering Mathematics II

MATH 398 TEACHING STRATEGIES IN MATHEMATICS (3 units) - This course deals with the basic strategies in the teaching of secondary school mathematics. The emphasis is given on the study and application of various teaching models that will develop among students the necessary competencies fundamental to information processing, concept formation, inquiry and problem-solving skills in mathematics.

MATH 415 ADVANCED CALCULUS I (3 units) - Advanced Calculus I is the first of two courses that provides an introduction to mathematical analysis beyond the calculus series. Topics include the real number system, point set topology, limits and continuity, the derivatives, multivariable differential calculus, implicit functions and extremum problems.

Pre-requisite: Calculus III

MATH 416 MATHEMATICAL MODELING (3 units) - The course introduces students to the process of modeling real world phenomena using the tools of mathematics. In-class lectures and discussions are supplemented by computer hands-on sessions.

Prerequisites: Differential Equations I, Statistics, and Linear Algebra

MATH 421 COMPLEX ANALYSIS (3 units) - This course involves a study of the algebra of complex numbers, analytic functions, elementary complex functions, complex integration, and the residue theorem and its applications.

Prerequisite: Advanced Calculus 1

MATH 426 ADVANCED CALCULUS II (3 units) - This course is a continuation of Advanced Calculus I. Topics include the convergence of sequences and series of real numbers, sequences and series of functions, uniform convergence, power series, functions of bounded variation and rectiiable curves, Riemann-Stieltjes integrals, interchanging of limit operations, multiple integration, improper integrals, transformations.

Pre-requisite: Advanced Calculus I

MATH 427 REAL ANALYSIS (3 units) - This course provides an introduction to measure and integration theory. It develops the theory of Lebesgue measure and integration over the real numbers. The course covers topics like the real number system, measurable functions, measurable sets, convergence theorems, integrals of simple and nonnegative measurable functions, and Lebesgue integral.

Prerequisite: Advanced Calculus I

MATH 428 THEORY OF INTEREST (3 units) - This course covers measures of interest, present and future values, equations of value, annuity-certains, general annuity certains, yield rates, extinction of debts, and bonds and securities.

Prerequisite: Calculus I

MATH 436 OPERATIONS RESEARCH I (3 units) - This course is an introduction to linear programming. It covers basic concepts, problem formulation, graphical solution for two-variable problems, simplex algorithm and other algorithms for special LP problems, duality and sensitivity analysis. In-class lectures and discussions are supplemented by computer hands-on sessions.

Prerequisite: Linear Algebra

MATH 411 RESEARCH IN MATHEMATICS (3 units) - This course aims to equip students with skills in conducting pure and applied mathematical research. It is expected that at the end of the course, students will be able to produce an expository paper.

PHYS 111 EARTH SCIENCE (3 units) - This is the study of the earth and its resources, including astronomy, geology, physiology, meteorology, and oceanography.

PHYS 125 PHYSICS FOR NURSES (3 units) - This course studies mechanics and properties of matter, heat, optics and sound, lenses, and optical instruments physical laws, forces, and Newton's Laws of Motion, work and energy, pressure, and principles applied to the life sciences and physics background needed by the students nurses for their professional work.

PHYS 211 GENERAL PHYSICS I (5 units, 3-unit lecture and 2-unit laboratory) - This course deals with solid matter and its properties. It covers scalar and vectors, kinematics in one dimension, kinematics in two dimensions, forces, and Newton's Laws of Motion, Dynamics of uniform circular motion, work and energy and impulse and momentum.

PHYS 222 GENERAL PHYSICS II (5 units, 3-unit lecture and 2-unit laboratory) - This course studies fluids, temperature and heat, transfer of heat, Gas Laws and kinetic theory, thermodynamics, waves and sound, electric forces and electric fields, electric circuits, magnetic forces and magnetic fields, and reflection of light.