MATHEMATICS (MATU)

MATU 085 Basic Math - Pre Algebra
This course was designed for students who need to build skills in Basic Math and Prealgebra. The course covers all the essential topics needed to be successful in Algebra. Topics include basic operations with integers and real numbers, fractions, decimals, exponents, order of operation, conversion of units, percents, radicals, linear equations, radicals, mathematical modeling, data interpretation and statistics, area, perimeter and volume of geometric figures, and the coordinate plane. This course is only offered through the School of Extended Education. 3 credits.

MATU 090 Elementary Algebra
This course was designed for students without any algebraic background. The course covers all the essential topics needed to be successful in Intermediate Algebra. Topics include algebraic techniques on real numbers, order of operation, exponents, absolute value, factoring, inequalities, polynomials, rational expressions and equations, radical expressions and equations, linear and quadratic equations, graphs of linear equations, graphs of inequalities, linear systems, systems of inequalities, and mathematical modeling. Upon completion, students will be able to solve real world applications and use appropriate models for analysis. This course is only offered through the School of Extended Education. 3 credits.

MATU 098 Plane Geometry
Prerequisite: MATU 090.

This course was designed to prepare students in the understanding of properties and applications in Euclidean geometry. Extensive use of definitions, postulates and theorems are used throughout this course to write proofs using deductive reasoning. Critical thinking skills are used in solving real world applications. Topics include angles, parallel and perpendicular lines, congruence, similar triangles, properties and applications of right triangles, introduction to trigonometry, constructions, transformations, polygons, circles, area, perimeter, surface area, volume, and three dimensional space. This course is only offered through the School of Extended Education. 3 credits.

MATU 099 Intermediate Algebra
Prerequisite: successful completion of basic algebra or equivalent.

This course focuses on topics such as linear, quadratic, exponential, and logarithmic functions and equations; rational expressions and equations, solving systems of equations in two to three unknowns, matrices and determinants, and conic sections. This course is only offered through the School of Extended Education. 3 credits.

MATU 101 College Algebra
Prerequisite: MATU 099.

Presents a study of College Algebra and Analytic Geometry with an emphasis on mathematical modeling. The student will analyze functions in depth including transformations, inverses and compositions, while paying particular attention to quadratic, polynomial, rational, exponential and logarithmic functions and their graphs. Other topics include complex numbers, the binomial theorem, arithmetic and geometric sequences, series, systems of equations and inequalities, matrices and determinants, partial fractions, algebraic equations and inequalities, conic sections and probability. The student will solve applications and modeling problems related to the above topics. Upon completion, students should be able to solve practical problems and use appropriate models for analysis. This course is designed to prepare students for Calculus. This course is only offered through the School of Extended Education. 3 credits.

MATU 102 Trigonometry
Prerequisite: MATU 101.

This course provides a study of the relationships between angles and sides of triangles, relationships between central angles and coordinate points on a circle, right triangles, circular functions, degree/radian measures of angles, trigonometric functions of angles, inverse functions, identities, graphic representations of trigonometric functions, law of sines and cosines, trigonometric equations, solutions of right and oblique triangles, vectors, complex numbers, and polar coordinates. Upon completion, students will be able to solve practical problems and use appropriate models for analysis. This course is only offered through the School of Extended Education. 4 credits.

MATU 103 Applied Mathematics
This course presents contemporary and historical topics in mathematics and discusses their use in modern business, science, social science, and other applications. Students will explore mathematical concepts in a real-world context. These concepts include problem-solving methods, set theory, graph theory, number theory, algebraic modeling, probability, statistics, voting methods, fair division, economics, and finance topics. 3 credits.

MATU 104 Pre-Calculus Mathematics I
Prerequisite: MATU 099.

Presents topics such as functions and transformations, linear and quadratic functions and inequalities, matrices and determinants, exponential and logarithmic functions. This course is only offered through the School of Extended Education. 3 credits.

MATU 112 Business Calculus
Prerequisite: MATU 101 and MATU 102 or MATU 104.

A study of calculus with emphasis placed on the applications and concepts relating to business and management problems. The course explores mathematical concepts, methods and applications from life issues, science, business, finance and environmental issues. Derivatives and integrals of functions including polynomials, rational, exponential and logarithmic functions are covered. This course is only offered through the School of Extended Education. 4 credits.

MATU 115 Calculus I
Prerequisite: MATU 104.

This Calculus I course is designed for science and math majors, premed students, and MBA students and covers the following topic areas: limits, continuity, derivatives from definition, derivatives from graphs, rules of differentiation, Mean Value Theorem, applications of differentiation, basic differential equations, optimization, L"Hopital"s Rule, curve sketching, Riemann integration, both parts of the Fundamental Theorem of Calculus and basic applications of integration. This course is only offered through the School of Extended Education. 4 credits.

MATU 116 Calculus II
Prerequisite: MATU 115.

Presents a continuing study of integration techniques, applications to physics and engineering, improper integrals, transcendental functions, first order differential equations, series and sequences, parametric equations and polar coordinates. Each topic is taught geometrically, numerically, and algebraically. This course is only offered through the School of Extended Education. 4 credits.

MATU 117 Calculus III
Prerequisite: MATU 115 and MATU 116.

Presents a study of differentiation and integration of functions of several variables, parametric curves and surfaces, and the calculus of vector fields. Topics are inclusive of, but not limited to, multivariable vector functions, partial derivatives, directional derivatives, surfaces and hyper surfaces, parametric equations, multiple integrals using several different coordinate systems, line integrals, Green's Theorem, the Divergence Theorem and Stokes Theorem. This course is only offered through the School of Extended Education. 4 credits.

MATU 203 Introduction to Statistics
Prerequisite: MATU 099 or higher.

This course presents an introduction to statistics and its practical applications. Topics include methods of sampling, graphical representation of data, descriptive statistics, elementary probability principles, discrete and continuous random variables, probability distributions, Central Limit Theorem, confidence intervals, hypothesis testing, correlation and regression, goodness-of-fit, and contingency tables. Students will explore the use of data analysis and statistical methods in the disciplines of business, health sciences, education, and social sciences. Computer software for statistical analysis of application problems is required. 3 credits.

MATU 204 Introduction to Statistics & Probability
Prerequisite: MATU 099.

A study of descriptive and inferential statistics and its applications to the fields of economics, business, ecology, psychology, education, mathematics and applied science. Topics are inclusive of, but not limited to, the analysis and classification of data, numerical summary measures, probability, discrete and continuous probability distributions, statistics and their sampling distribution, the Central Limit Theorem, point estimation, confidence intervals, hypothesis testing with one and two samples, correlation and regression, Chi-Test and the F-Distribution, Analysis of Variance, and Nonparametric Tests. Upon completion, students will be able to solve real world problems and use appropriate models for analysis. This course is only offered through the School of Extended Education. 3 credits.

MATU 206 Mathematics for Elementary School Teachers I
MATU 206 helps students develop an understanding of math concepts and techniques to teach them to elementary level students. This is the first course in a two-course series. Specific attention is placed on the Elementary Subject Matter Program Standards for the area of mathematics (first two domains of the California teacher preparation standards for mathematics): Domain 1-Number Sense and Domain 2-Algebra and Functions. This course also helps build a connection between the learning process, teaching/learning math, and the Common Core. 3 credits.

MATU 207 Mathematics for Elementary School Teachers II
MATU 207 helps students develop an understanding of math concepts and techniques to teach them to elementary level students. This is the second course in a two-course series. Specific attention is placed on the Elementary Subject Matter Program Standards for the area of mathematics (final two domains of the California teacher preparation standards for mathematics): Domain 3-Measurement and Geometry and Domain 4-Statistics, Data Analysis, and Probability. This course also helps build a connection between the learning process, teaching/learning math, and the Common Core. 3 credits.

MATU 211 Linear Algebra
Prerequisite: MATU 117.

This course includes the study of vectors in the plane and space, systems of linear equations, matrices, determinants, vector spaces, linear transformations, inner products, eigenvalues, eigenvectors, diagonalization, matrix decomposition, and the Spectral Decomposition theorem. This course is only offered through the School of Extended Education. 4 credits.

MATU 220 Methods of Proof in Mathematics
Prerequisite: MATU 117.

This course is an introduction to abstract mathematics, with an emphasis on the techniques of mathematical proof (direct, contradiction, conditional, contraposition). Topics to be covered include logic, set theory, relations, functions and cardinality. This course is only offered through the School of Extended Education. 4 credits.

MATU 251 Discrete Mathematics
Prerequisite: MATU 101 or MATU 104.

This course was designed for students in math and computer science. Logic is emphasized in this course, and topics include proof and theory (including inductive and deductive proofs), propositional and predicate logic, set theory, algorithms (including recursion), trees, relations and functions, counting and probability, and elements of the theory of directed and undirected graphs (including Dijkstra's shortest path algorithm). Additionally, an introduction to complexity of algorithms and recurrence relations are included. Upon completion, students will be able to solve real world problems and use appropriate models for analysis. This course is only offered through the School of Extended Education. 4 credits.

MATU 310 Abstract Algebra
Prerequisite: MATU 220 and MATU 211.

An introduction to the principles and concepts of modern Abstract Algebra. Topics include groups, rings, and fields, isomorphisms, and homomorphisms with applications to number theory, the theory of equations, and geometry. This course is only offered through the School of Extended Education. 4 credits.

MATU 320 Number Theory
Prerequisite: MATU 211 and MATU 220.

An introduction to the principles and concepts of Number Theory. Topics include distribution of primes, representations of integers, Fibonacci numbers, divisibility, Euclidean algorithm, fundamental theorem of arithmetic, number-theoretic functions, Diophantine equations, congruence, primitive roots, the Chinese remainder theorem, quadratic residues, and elementary partition theory. This course is only offered through the School of Extended Education. 4 credits.

MATU 329 Experimental Topics in Mathematics
An examination of selected topics in Mathematics relevant to evolving areas in the field. Syllabi must be approved by the Dean and announced to the Curriculum and Academic Committee prior to being offered. May be repeated for credit provided that the course content is different each time. 3 credits.

MATU 499 Independent Study
Prerequisites: Instructor's approval and approval of petition.

Directed reading and/or research designed to meet specific needs of superior upper division students. 1-3 credits.