MATHEMATICS (MATH)

MATH 5011. Foundations of Arithmetic for Teachers I*. (3 Credits)**
Sets, whole numbers, fractions, elementary number theory, algorithms, elementary geometry and a study of the metric system. Designed for teachers of grades K-4.

MATH 5012. Foundations of Arithmetic for Teachers II*. (3 Credits)**
Numeration systems, elementary number theory, rational numbers, real numbers, basic algorithms, graphs and measurements. For teachers of grades 4-8.

MATH 5110. Algebraic Structures for Teachers*. (3 Credits)**
Elementary study of the properties of groups, integral domains and fields. Prerequisite: 5011 or consent of instructor .

MATH 5111. Theory of Numbers. (3 Credits)
Properties of integers, divisibility, congruence of numbers. LaGrange's theorem, residues and Diophantine equations. Prerequisite: Graduate standing .

MATH 5112. Linear Algebra. (3 Credits)
Vector spaces and linear transformations. Other topics include equations, matrices, determinants, characteristic values, the special theorem, linear functions and dual space. Prerequisite: Graduate standing.

MATH 5113. Modern Algebra I & II. (3 Credits)
Groups, permutation groups, finite groups, group mappings, rings, ideals, quotient rings, fields, finite fields, polynomial rings, field extensions, vector spaces, algebra of linear transformations. Prerequisite: Graduate standing.

MATH 5201. Programming in BASIC. (3 Credits)

MATH 5202. Technology -Oriented Mathematics. (3 Credits)
Applications of mathematical software and graphic calculators in doing and teaching mathematics. Problem-solving and simulations using software such as Mathematics, Maple, Math Lab and statistical packages.

MATH 5211. Fundamental Concept of Analysis I. (3 Credits)
Sets and functions, real number system, topological concepts in real Cartesian spaces, sequences, limits, continuity, uniform continuity, differentiation and integration, convergence, uniform convergence. Prerequisite: Graduate standing .

MATH 5213. Complex Analysis. (3 Credits)
Complex numbers, analytic functions, complex series, Cauchy's theory, residue calculus and conformal mappings. Prerequisite: MATH 5211 .

MATH 5214. Differential Equations. (3 Credits)
Ordinary differential equations of first and higher order, solutions in series, Laplace transforms numerical solutions. Prerequisite: MATH 5211 or consent of instructor .

MATH 5215. Numerical Analysis. (3 Credits)
Nature of error, Gaussian elimination for linear systems, iteration, Newton's method, steepest descent for nonlinear systems, zeros of polynomials and interpolation. Prerequisite: MATH 5211or consent of instructor .

MATH 5311. Geometry of Teachers*. (3 Credits)**
Points, lines, planes, parallel and perpendicular lines, congruence, similarity, measurement, constructions, space figures, analytical geometry and non-Euclidean Geometry. Prerequisite: Graduate standing. The candidate must earn a minimum grade of 'B' to receive credit on the program of study for this course.

MATH 5312. Foundations of Geometry. (3 Credits)
Euclidean and non-Euclidean geometry, including incidence, order and the parallel postulate. Prerequisite: Graduate standing .

MATH 5313. Modern Geometry. (3 Credits)
An algebraic approach to geometry using vectors and transformations. For secondary teachers. Prerequisite: MATH 5112 or consent of the instructor .

MATH 5314. Introduction to Point Set Topology. (3 Credits)
Set theory, general topological spaces, product spaces, sequences, compactness, connectedness, metric spaces and Tcychonoff theorem. Prerequisite: Graduate standing .

MATH 5410. Probability and Statistics for Teachers*. (3 Credits)**
Probability, gathering and recording data, construction and use of tables, tabulating and graphing percentiles, mean and standard deviation, frequency distributions, normal distribution and statistical interference correlation. Prerequisite: Consent of instructor .

MATH 5411. Probability/Statistics for Tch. (3 Credits)

MATH 5412. Methods of Statistical Analysis. (3 Credits)
Estimation and inference using basic probability distributions, analysis of variance, analysis of covariance, regression, correlation and basic experimental design. Prerequisite: A previous course in statistics.

MATH 5414. Introduction to Operations Research. (3 Credits)
Linear programming, the simplex method, network theory, games theory, Markov analysis, other topics including inventory analysis and queuing theory. Prerequisite: Graduate standing.

MATH 5509. Programming in BASIC for Teach. (3 Credits)

MATH 5511. History of Mathematics. (3 Credits)
Growth and development of the discipline of Mathematics from antiquity to modern times. Special emphasis given to the evolutionary character of the principal ideas of modern Mathematics.

MATH 5514. Biostatistics I. (3 Credits)
This course offers an introduction to variety statistical tools with applications in public health, biomedicine, biological science and related fields. Topics include descriptive statistics, probablilty distributions, inferential statistics (estimation and hypothesis testing), nonparametric methods, linear regression, categorical data analysis, analysis of variance, and survival ananlysis.

MATH 5670. Special Topics in Mathematical Sciences. (3 Credits)
An exploration of special topics of current interest in the Mathematical sciences. Prerequisite: Consent of instructor.