

M.Ed. in Secondary Education (Certification 6-12)
Mathematics Content Course Requirements

Math 161: Calculus I	This course is a traditional introduction to differential and integral calculus. Functions, limits, continuity, differentiation, intermediate and mean-value theorems, curve sketching, optimization problems, related rates, definite and indefinite integrals, fundamental theorem of calculus, log and exponential functions.
MATH 162 Calculus II	Calculus of logarithmic, exponential, inverse trigonometric, and hyperbolic functions. Techniques of integration. Applications of integration to volume, surface area, arc length, center of mass, and work. Numerical sequences and series. Study of power series and the theory of convergence. Taylor's theorem with remainder.
Math 201: Number Theory	This course contains deep knowledge of numbers and operations that includes: prime numbers, Mersenne primes, and quadratic reciprocity, applications to cryptography, primality testing, Carmichael numbers, Gaussian integers, continued fractions, algebraic numbers, and transcendental numbers.
Math 212: Linear Algebra	This course is an introduction to linear algebra in abstract vector spaces with particular emphasis on \mathbb{R}^n . Topics include: Gaussian elimination, matrix algebra, linear independence, span, basis, linear transformations, determinants, eigenvalues, eigenvectors, and diagonalization.
Math 215: Object oriented Programming	This is an introductory programming course for students interested in mathematics and scientific computing. Students will program primarily in a general object-oriented language such as Python, with supplementary exercises in a computer algebra system. Examples will be drawn primarily from applications of calculus, elementary number theory, and cryptography.
MATH 263: Multivariable Calculus	Vectors and vector algebra, vector-valued functions, functions of several variables, differential and integral calculus of functions of several variables, and advanced topics including change of variables in multiple integration, Green's Theorem, the Divergence Theorem, and Stokes' Theorem. Software such as MAPLE may be utilized.
Math 301: History of Mathematics	This course explores selected topics in the history of mathematics that include the origins and uses of measurement systems. They include: Babylonian and Egyptian mathematics to Pythagoras and Euclid to the Hindu-Arabic numeration system to the mathematical art of Escher.
MATH 313: Abstract Algebra	A rigorous introduction to the study of abstract algebraic systems with emphasis on the theory of groups. Equivalence relations, subgroups, homomorphisms, quotients, products, linear groups, permutation groups, and selected advanced topics.
Math 318: Combinatorics	Many Discrete Mathematics topics are contained in this course including: Induction, pigeon-hole principle, permutations, combinations, recurrence relations, graph theory, graph coloring, and combinatorial design.
MATH 320: Mathematics Logic	This course in modern mathematical logic begins with a study of propositional logic and leads to an examination of first-order predicate logic including quantifiers, models, syntax, semantics, and the completeness and compactness theorems. Additional topics include Goedel's incompleteness theorems. Connections with abstract algebra and other areas of mathematics are explored.

Stat 203: Statistics or Stat 335: Biostatistics	This course is an introduction to statistical methodology and theory using the techniques of one-variable calculus. Topics include: experimental design, descriptive statistics, probability theory, sampling theory, inferential statistics, estimation theory, testing hypotheses, correlation theory, and regression.
MATH 344: Projective Geometry	Axiomatic systems which define geometries. Topics in Euclidean and non-Euclidean geometry.