MATHEMATICS (MATH)

MATH 5000. History of Mathematics (3)
This course is an exploration of the historical development of mathematics in various civilizations, ranging from the antiquity of Babylonia and Egypt through classical Greece, the Middle and Far East, and on to modern Europe. Topics may include the development of areas such as arithmetic, geometry (practical, deductive, and axiomatic), number theory, trigonometry, syncopated and symbolic algebra, probability, statistics, and calculus.

MATH 5010. Mod. Meth. of Teaching Math (3)
This course will explore theory and pedagogy of mathematics instruction with a focus on teaching methods across a variety of topics. Appropriate integration of technology into mathematics teaching and learning will be emphasized.

MATH 5130. Applied Algebra (3)
This course is an investigation of the use of theoretical concepts of abstract algebra in order to solve non-theoretical problems, with an emphasis on applications. Topics are selected from symmetry groups, exact computing, linear codes, Boolean algebras, cryptography, and geometric constructions. Other topics may be covered according to time and student interest.

MATH 5220. Applied Statistics (3)
This course extends the concepts of introductory statistics through the study and exploration of advanced inferential methods. Analysis of variance using simple experimental design, and multiple regression analysis (including model building, checking, and analysis of residuals) are introduced. Additional topics covered in the course are multifactor analysis of variance, chi- square testing, and non-parametric statistical methods. Throughout the course real data are utilized. Applications include the use of a statistical software package.

MATH 5221. Fnd.s of Business Analytics (3)
This course covers intermediate principles of the statistics, probability, and analytics required for applications to supply chain analytics. Case studies and real-life applications in supply chain analytics will utilize industry standard computer applications. Students completing this course will understand the broad directions of statistical approaches to analytics and the practical use and interpretation of data.
Prerequisites: BUSA 5200

MATH 5231. Modern Geometry (3)
This course is a study of Euclidean and non-Euclidean geometries. Topics will be explored through historical perspectives, formal geometric proofs, technology-based investigations, and modern applications.

MATH 5250. Elementary Number Theory (3)
An introduction to the mathematical treatment of concepts related to the integers. Topics include divisibility, prime numbers, numerical functions, congruence classes and Diophantine equations. Other topics, such as rational and irrational numbers may be addressed.

MATH 5255. Factoring & Primality Testing (3)
This course is a study of deterministic and probabilistic methods for factoring large integers and testing whether an integer is prime or composite. Topics to include Pollard's algorithms, Pseudoprime tests, the Rabin-Miller test, the Quadratic Sieve, Lucas Sequences, Pratt Certificates, and other methods according to time and student interest. Computer technology will be used heavily in this course.

MATH 5261. Introductory Probability (3)
This is an introductory course in Mathematical Probability. It explores the topics of probability, random variables and their distributions, mathematical expectation, moment generating functions and sampling distributions.

MATH 5350. Graph Theory (3)
This course is a study of graph theory and graph theoretical problem solving techniques. Topics are selected from connectivity, Eulerian graphs, Hamiltonian graphs, algorithms, properties of trees, counting trees, planar graphs, Euler's formula, graphs on other surfaces, dual graphs, infinite graphs, coloring vertices, Brook's Theorem, coloring maps, coloring edges, chromatic polynomials, Eulerian digraphs and tournaments, Markov chains, Hall 'marriage' theorem, transversal theory, Application of Hall's theorem, Menger's theorem, and network flows.

MATH 5360. Combinatorics (3)
This course is a study of combinatorial problems and solving techniques. Topics are selected from counting principles, enumeration, generating functions, recurrence relations, Polya's theory of counting, Ramsey Theory, extremal graph theory, probabilistic methods, and the Szemeredi Regularity Lemma.

MATH 5365. Applied Combinatorics (3)
This course is a study of some applications of combinatorics. Some of the topics that are explored in this course are: Pólya theory of counting, combinatorial design, coding theory, existence problems in graph theory, matching and covering, optimization problems for graphs and networks.

MATH 5520. Introduction to Analysis (3)
This is a rigorous introduction to analysis of functions on Euclidean space. Topics include limits, continuity, sequences, series, differentiation, integration, and sequences and series of functions.

MATH 5525. Topology (3)
This course is an introduction to topology via a variety of different techniques and applications involving point set, geometric, and algebraic topology. Topics include, but are not limited to: continuity, open and closed sets, compactness and connectedness, identification spaces, the fundamental group, triangulations, and surfaces. Further topics may include: simplicial homology, degree and Lefshetz number, knots, and covering spaces.

MATH 5800. Selected Topics in Mathematics (3)
Topics of interest in mathematics not covered in courses in current graduate catalog.

MATH 5801. Selected Topics in Mathematics (3)
Topics of interest in mathematics not covered in courses in current graduate catalog.

MATH 5803. Selected Topics in Mathematics (3)
Topics of interest in mathematics not covered in courses in current graduate catalog.

MATH 5804. Selected Topics in Mathematics (3)
Topics of interest in mathematics not covered in courses in current graduate catalog.