Mathematics Course Descriptions

G-MA 105 College Algebra

3 hours
A study of elementary concepts of sets, fundamental properties of the real number system, linear and nonlinear relations, functions and their graphical representations, matrices and determinants, permutations and combinations, and mathematical induction. (Fall, Spring)

G-MA 106 Pre-Calculus

4 hours
A detailed study and analysis of algebraic and transcendental functions. Includes their properties, related analytic geometry, limits and continuity. This course is recommended for student who have taken College Algebra with a grade of C or better, or have successfully completed a high school Trigonometry course. (Fall)

G-MA 111 Calculus I

4 hours
Review of functions, graphs and models; introduction to limits, derivatives and integrals of algebraic and trigonometric functions; applications of differentiation and integration. (Spring)

MA 112 Calculus II

4 hours
Limits, derivatives and integrals of exponential, logarithmic and inverse trigonometric functions; techniques of integration; calculus of parametric and polar-coordinate equations; infinite sequences and series; first-order differential equations. Prerequisite: G-MA 111 Calculus I with a grade of C or better. (Fall)

G-MA 123 Discrete Mathematics

3 hours
A study of some of the basic topics of discrete mathematics, including elementary logic, properties of sets, functions and relations, mathematical induction, counting problems using permutations and combinations, trees, elementary probability, and an introduction to graph theory. (Fall, even years)

G-MA 153 Principles of Geometry

3 hours
A coverage of the basic principles of Euclidean geometry. Topics include points, lines, segments, rays, angles, congruence, parallel lines, polygons (special attention is given to triangles and quadrilaterals), geometric similarity, properties of right triangles, area of various plane regions, solid geometry, and an introduction to trigonometry. (Fall)

G-MA 201 Survey of Mathematics

3 hours
A study of the philosophy, nature, significance and use of mathematics from early times to the present. Topics may include the use of graph theory to solve optimization problems in management science; conflict resolution using fair division; mathematical analysis of voting systems; applications of geometry to the size and shape of objects and to calculating inaccessible distances; geometric growth and decay; non-Euclidean geometry; number systems; logic; and probability and statistics. (Interterm)

MA 211 Linear Algebra

3 hours
An in-depth study of vectors, matrices and vector spaces. Includes systems of equations, eigenvectors and eigenvalues, linear independence, dimension and linear transformations. (Spring)

MA 212 Calculus III

4 hours
Three-dimensional coordinate systems; vectors and vector-valued functions; partial derivatives; multiple integrals; vector calculus; second-order differential equations. Prerequisite: MA 112 Calculus II with a grade of C or better. (Spring)

G-MA 221 Elementary Applied Statistics

4 hours
A study of the principles of descriptive statistics, probability, sample and population relationships, estimation, and hypothesis testing. The computer is used as an aid in problem solving. This course is recommended for students who have completed three years of high school math or Discrete Math with a C or better. (Fall and Spring)

MA 311 Advanced Analysis

4 hours
Fundamental concepts of analysis, functions of bounded variation, integration, sequences of functions. Fourier series, functions of a complex variable. Prerequisite: MA 212. Also recommended: G-MA 123. (Fall)

MA 342 Modern Geometry

4 hours
A survey of selected topics in Euclidean geometry, projective geometry, non- Euclidean geometry, foundations of geometry and convex figures. Required for secondary education mathematics majors. Prerequisite: MA 112 Calculus II with a grade of C or better. (Spring, even years)

MA 366 Differential Equations

4 hours
Introduction to methods and applications of ordinary differential equations. Topics include first order differential equations and applications, higher order linear differential equations with applications, Laplace transforms and an introduction to numerical methods. Prerequisite: MA 112 Calculus II with a grade of C or better. (Fall, odd years)

MA 375 Junior Seminar

1 hour
A colloquium-type seminar. Junior mathematics majors prepare for an independent senior project in mathematics and select a project topic. (Fall)

MA 411 Algebraic Structures

4 hours
A survey of abstract algebra, with an emphasis on linear algebra. Topics include bijections, projections, groups, rings, matrices, modules, vector spaces and eigen values. Prerequisite: MA 112 Calculus II with a grade of C or better (Spring, odd years)

MA 441 Combinatorics and Graph Theory

3 hours
A study of directed graphs, trees, circuits, paths, network flows, basic combinatorics, generating functions, difference equations. Emphasis on applications and on use of computer in problem solutions. Prerequisite: MA 112 Calculus II with a grade of C or better. (on demand)

MA 475 Senior Project

2 hours (Language Intensive)
Students will investigate an advanced topic in a field of mathematics outside their classroom experience. Students will work in continual consultation with their research advisor. Regular informal oral and written updates of the project are required. The project culminates with a formally written project and a formal oral presentation of the project. (Spring)

Special Course Options
295/495 Field Experience (1-4 hours)
297 Study Abroad (12-16 hours)
299/499 Independent Study (1-4 hours)
388 Career Connections (3-10 hours)
445 Readings and Research (1-4 hours)