

# Mathematics Course Descriptions

## **ID 110 Beginning Algebra Laboratory**

*1 hour*

This college-preparatory course is designed to supplement the algebraic background of students prior to taking Intermediate Algebra. Topics include sets, fundamental operations, polynomials, linear equations and inequalities, factoring, graphing of linear equations, radical expressions, and use of calculators. Prerequisites: One year or less of high school mathematics. (Spring)

## **ID 119 Intermediate Algebra**

*3 hours*

This course presents algebraic skills needed prior to taking college level mathematics coursework. Topics include linear equations and inequalities in two variables and their graphs, systems of linear equations and inequalities, introduction to functions, factoring, algebraic fractions, rational equations, radicals and rational exponents, complex numbers, and quadratic equations. Prerequisites: ID 110 Beginning Algebra Laboratory with a grade of C or better, or two years of high school mathematics and an ACT mathematics score of at least 15 or an appropriate score on the departmental placement test. (Fall & Spring)

## **G-MA 105 College Algebra**

*4 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. Prerequisite: ID 119 Intermediate Algebra with a grade of C or better, or three years of high school mathematics and an ACT mathematics score of at least 22 or an appropriate score on the departmental placement test. (Spring)

## **MA 106 Precalculus**

*4 hours*

A detailed study and analysis of algebraic and transcendental functions. Includes their properties, related analytic geometry, limits and continuity. Prerequisite: G-MA 105 College Algebra with a grade of C or better, or three years of high school mathematics and an appropriate score on the departmental placement test. (on demand)

## **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. Prerequisite: MA 106 Precalculus with a grade of C or better, or four years of high school mathematics and an ACT mathematics score of at least 25 or an appropriate score on the departmental placement test. (Fall)

## **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. (Spring)

## **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. Prerequisite: ID 119 Intermediate Algebra with a grade of C or better, or an ACT mathematics score of at least 24 or four years of high school mathematics and an appropriate score on the departmental placement test. (Fall, even years)

## **G-MA153 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. Prerequisite: ID 119 Intermediate Algebra, or a mathematics ACT score of 17 or greater. (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. Prerequisite: ID 110 Beginning Algebra Laboratory with a grade of C or better, or two years of high school mathematics and an ACT mathematics score of at least 15 or appropriate score on the departmental placement test. (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. (Fall)

### **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. Prerequisite: ID119 Intermediate Algebra with a grade of C or better, or three years of high school mathematics and an ACT mathematics score of 22, or an appropriate score on the departmental placement test. (Fall and Spring)

### **G-MA 290 History of Mathematics**

*3 hours (Language Intensive)*

Study of some of the most influential mathematicians from antiquity to the modern era, and their impact on the development of mathematical thought. Particular emphasis is given to the contributions of different ethnic groups and cultures. Prerequisite: G-MA 105 (or higher level course) with a grade of C or better. (Interterm, odd years)

### **MA 411 Introduction to 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 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. (Spring, even 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 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. (Fall)

### **Individualized Courses Available**

**295/495** Field Experience (1-4 hours)

**299/499** Independent Study (1-4 hours)

**388** Career Connections (1-12 hours)