

# MA: Mathematics

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**Arithmetic proficiency** is a requirement for the AAS degree. Based on the arithmetic placement test, a student who shows need for improvement in arithmetic may be required to enroll in either MA 001 or MA 002 or in a math independent learning program (MD 008) before registering for classes that have arithmetic proficiency as a prerequisite. Arithmetic proficiency may also be demonstrated by a qualifying score on the mathematics portion of the SAT or ACT, or by transfer credit in college algebra, quantitative methods, precalculus, or calculus, or by a passing grade in an equivalent developmental mathematics course offered at another accredited college or university.

**Algebra proficiency** is a prerequisite for MA 213, MA 311, MA 321, and MA 331 courses, a number of which are required for the BS degree in the following majors: Advertising and Marketing Communications, Cosmetics and Fragrance Marketing, Direct and Interactive Marketing, Fashion Business Management, International Trade and Marketing for the Fashion Industries, Production Management: Fashion and Related Industries, and Technical Design. Based on the algebra placement test, a student who shows need for improvement in algebra will be required to enroll in MA 003 Algebra Review before registering for classes that have algebra proficiency as a prerequisite. A student may also choose to register for MA 003 without taking the placement test. Algebra proficiency may also be satisfied by a qualifying score on the mathematics portion of the SAT or ACT, or by transfer credit in college algebra, quantitative methods, precalculus, or calculus, or by a passing grade in an equivalent developmental mathematics course offered at another accredited college or university.

## **MA 001 — Developmental Mathematics I**

4 credits; 4 lecture hours

Concentrates on fundamental arithmetic skills and applications. Topics include operations on real numbers, exponentiation and order of operations, ratio and proportion, systems of measurement, fractions, decimals, and percents. Fundamentals of algebra and geometry are introduced.

Prerequisite(s): SAT math score 440 and below, or ACT math score 18 and below, or appropriate score on arithmetic placement test.

## **MA 002 — Developmental Mathematics II**

2 credits; 2 lab hours

An accelerated arithmetic course emphasizing applications, and including such topics as percents, operations on fractions, ratios and proportions, and conversion between the metric and English measurement systems. Fundamentals of algebra and geometry are introduced. Prerequisite(s): SAT math score 450 - 490, or ACT math score 19 - 20, or appropriate score on arithmetic placement test.

## **MA 003 — Algebra Review**

2 credits; 2 lecture hours

For those students who need improvement in algebra. Reviews basic algebra topics such as signed numbers, solving linear and simultaneous equations, factoring, exponents, and graphing linear equations, with emphasis on verbal problems. Prerequisite(s): SAT math score 550 and below, or ACT math score 23 and below, or appropriate score on algebra placement test.

## **MA 005 — Developmental Math for Fashion Merchandising Management**

4 credits; 4 lecture hours

A developmental math course specifically designed for FMM students. In addition to the fundamentals of arithmetic, emphasis is placed on the skills needed for the quantitative study of merchandising in the FMM curriculum.

Prerequisite(s): SAT math score 510 or below, or ACT math score 21 or below, or appropriate score on Fashion Merchandising Management math placement test.

### **MA 009 — Developmental Mathematics for Fashion Design**

3 credits; 3 lecture hours

A developmental math course specifically designed for Fashion Design AAS students. The fundamentals of arithmetic and geometry are taught in the context of the design, production, and costing skills covered in the Fashion Design curriculum.

Prerequisite(s): SAT math score 510 and below, or ACT math score 21 and below, or appropriate score on arithmetic placement test.

### **MA 041 — Geometry and Probability Skills**

1 credit; 1 lab hour

For Toy Design students. This course helps students develop the fundamental computational skills required for MA 241.

Corequisite(s): MA 241.

### **MA 142 — Geometry and the Art of Design (formerly MA 242)**

3 credits; 3 lecture hours

A contemporary primer of geometric topics that expand the concepts of shape and space, this course presents some of the established and emerging ways geometry can provide tools and insights for artists and designers. Included are a variety of visual phenomena such as fractals, knots, mazes, symmetry, and the golden ratio. (G2: Mathematics)

Prerequisite(s): arithmetic proficiency (see beginning of Mathematics section).

### **MA 153 — Programming and Mobile Apps**

3 credits; 3 lecture hours

This course is an introduction to programming for mobile apps. Through visual programming tools, students learn to build mobile apps and control all aspects of the application. Computer science concepts are introduced to provide a complete understanding of the programming process. No previous programming experience is required.

Prerequisite(s): Arithmetic Proficiency.

### **MA 161 — Mathematical Ideas**

3 credits; 3 lecture hours

Provides an overview of the historic, heuristic, and visual dimensions of mathematics. Includes the golden ratio, fractal geometry, sets and groups, logic and circuits, Euler diagrams, number theory, and discrete math. (G2: Mathematics)

Prerequisite(s): arithmetic proficiency (see beginning of Mathematics section).

### **MA 213 — Quantitative Methods**

3 credits; 3 lecture hours

Explores the mathematical model-building process in the settings provided by linear programming and probability. Includes simplex methods for solving linear programs; duality; matrix algebra; probability models based on equally likely outcomes, independent events, and conditional probability; applications, particularly to business and economics; and elementary math of finance. (G2: Mathematics)

Prerequisite(s): algebra proficiency (see beginning of Mathematics section).

### **MA 222 — Statistical Analysis**

3 credits; 2 lecture and 2 lab hours

Studies the principles and methods of statistical analysis including probability distributions, sampling distributions, error of estimate, significance tests, correlation and regression, chi-square, and ANOVA. Introduces the use of the computer to store, manipulate, and analyze data. (G2: Mathematics)

Prerequisite(s): arithmetic proficiency (see beginning of Mathematics section).

### **MA 231 — Precalculus**

3 credits; 3 lecture hours

This traditional precalculus course introduces students to math concepts for a wide variety of applications. Topics include polynomial, rational, exponential, and logarithmic functions; sequences and series; analytic geometry; and trigonometry. (G2: Mathematics)

Prerequisite(s): algebra proficiency (see beginning of Mathematics section).

### **MA 241 — Topics in Probability and Geometry**

3 credits; 3 lecture hours

For Toy Design students. The understanding of geometry and probability in everyday natural and social environments and their use as tools for analysis and creativity in toy design. Shapes and figures are examined through geometrical study. Problems in probability are translated from mathematical concepts to real situations. (G2: Mathematics)

Co-requisite(s): MA 041.

### **MA 272 — Islamic Art & Mathematics**

3 credits; 3 lecture hours

This is an interdisciplinary course cross-listed with HA 272. Students are introduced to the art and architecture of the Islamic world from the 7th century CE to the present. They are given a glimpse into the intertwined nature of mathematical, structural and decorative languages used by artisans and designers in this period.

### **MA 299 — Independent Study in Mathematics**

1-3 credit

Prerequisite(s): a minimum 3.5 GPA and approval of instructor, chairperson, and dean for Liberal Arts.

### **MA 311 — Mathematical Modeling for Business Applications**

3 credits; 2 lecture and 2 lab hours

To instill the value of mathematics as a tool for modeling real-life situations, this course focuses on an analytical approach to business decision-making. Topics covered include finance, cash flow, probability, linear programming, and the business applications of basic equations. Microsoft Excel is used. (G2: Mathematics)

Prerequisite(s): algebra proficiency (see beginning of Mathematics section).

### **MA 321 — Data Analysis for Business Applications**

3 credits; 3 lecture hours

This course covers intermediate statistics topics with applications to business. Students graph, manipulate, and interpret data using statistical methods and Excel. Topics include data transformations, single and multiple regression, time series, analysis of variance, and chi-square tests. Applications are from the areas of retail, finance, management, and marketing. (G2: Mathematics)

Prerequisite(s): MA 222 and algebra proficiency\*\*.

### **MA 322 — Statistics, Machine Learning & Data Mining**

3 credits; 3 lecture hours

This is an introduction to statistical techniques for machine learning and data mining. It emphasizes mathematical methods and computer applications related to automated learning for prediction, classification, knowledge discovery and forecasting in modern data science. Special emphasis will be given to the collection, mining, and analysis of massive data sets.

Prerequisite(s): Algebra Proficiency and MA 222. (G3: Mathematics).

### **MA 331 — Calculus**

3 credits; 3 lecture hours

Develops basic principles of differential calculus and introduces integral calculus. Functions, graphing, and maxima-minima problems are studied in the context of business and other applications. (G2: Mathematics)

Prerequisite(s): algebra proficiency (see beginning of Mathematics section) and MA 231 or permission of chairperson.

### **MA 332 — Calculus II**

3 credits; 3 lecture hours

This course continues the development of the differential and integral calculus topics covered in Calculus I. Students interpret the integral both as an antiderivative and as a sum of products. Students employ the standard techniques of integration to solve problems involving business applications. Topics to be covered include L'Hopital's rule, integration by parts, power series, and the integration of standard mathematical functions.

Prerequisite(s): MA 331.

### **MA 361 — Number Theory**

3 credits; 3 lecture hours

Students are introduced to modular arithmetic and basic cryptography algorithms through a systematic treatment of topics such as divisibility, remainders, fractions and functions, mod  $b$ , and Fermat's little theorem. The course culminates in applications of the RSA encryption algorithm.

(G2: Mathematics)

Prerequisite(s): algebra proficiency (see beginning of Mathematics section).

### **MA 391 — Mathematics of the Ancient World in Its Cultural and Historic Context (Honors)**

3 credits; 3 lecture hours

This interdisciplinary survey of mathematics from prehistory to Archimedes covers topics from the basic (different ways of conceiving numbers) to the complex (a proof of the Pythagorean theorem). The cultural and historical context of the mathematical achievements of ancient Egypt, Mesopotamia, and Greece are emphasized in a way that shows these achievements as a natural and integral part of the civilizations that created them. Comparisons to modern methods in mathematics are stressed. (G2: Mathematics)

Prerequisite(s): qualification for Presidential Scholars or a min. 3.5 GPA with approval of dean for Liberal Arts, arithmetic and algebra proficiencies, and a min. grade of 85 on Regents Math III, min. SAT math score of 530, or G2: Math requirements.

### **MA 392 — The Mathematics of Personal Finance (Honors)**

3 credits; 2 lecture and 2 lab hours

Students interpret and draw inferences from mathematical models that underlie essential notions of financial planning. Students represent mathematical information symbolically, verbally, and in writing within a financial context, exploring interest types, retirement, taxation, credit cards, mortgages, and investing. (G2: Mathematics)

Prerequisite(s): algebra proficiency (see beginning of Mathematics section) and qualification for Presidential Scholars Program, or 3.5 GPA with approval of dean for Liberal Arts.