MATHEMATICS (MTH)

MTH 08 - Pre-Algebra
Credit Hours: 4, **Contact Hours: 4**
Division: Science Math
This course provides a review of basic arithmetic skills. It begins by reviewing traditional by-hand calculations, including multiplication and long division. Integers are introduced (signed numbers) and then all operations are combined, including exponents and grouping symbols, using the correct order of operations. The concepts of prime factorization, LCM and GCD are introduced to lead in to fraction arithmetic. Fraction arithmetic includes addition, subtraction, multiplication, and division of fractions and mixed numbers as well as combined operations using the order of operations. Basic proportions and unit prices are used to solve problems. Decimals, and their relation to fractions, with both negative and positive signs are studied. All basic operations are applied to decimals. Then percentages and ratios and proportions are studied. We finish the course by learning about measurement systems and unit analysis, along with basic geometry including the Pythagorean Theorem. Every unit of study features applications as well as pure theory. By-hand calculations are taught and used at all levels.
Required Prerequisites: Placement into MTH 08
Recommended Prerequisites: Basic arithmetic skills

MTH 23 - Beginning Algebra
Credit Hours: 4, **Contact Hours: 4**
Division: Science Math
This is a basic course in algebra covering the following topics: operations on integers, rational numbers, numbers in scientific notation, and polynomials; exponent rules; dimensional analysis; solving linear equations; applications of linear equations in geometry, mixture, percents, and motion; graphing and analysis of graphs, particularly lines, in the coordinate plane; factoring; solving quadratic equations by factoring, applications of quadratic equations in geometry, mixture, percents and motion. The course concludes with an introduction to simplifying multiplying and dividing rational expressions and solving proportions. Good math writing form is stressed.
Required Prerequisites: A grade of 2.0 or better in MTH 08 or appropriate placement.

MTH 111 - Intermediate Algebra
Credit Hours: 4, **Contact Hours: 4**
Division: Science Math
Intermediate Algebra covers elementary set notation, a description of the Real number system, its major subsets, and an introduction to the Complex number system. Simplifying exponents, and algebraic expressions. Solving linear, quadratic, rational, and radical equations. Linear inequalities and systems of equations are also solved. The function concept is referenced throughout including the graphical, symbolic and numerical representations. Group 2 course.
Required Prerequisites: A grade of 2.0 or better in MTH 23 or appropriate placement.
Recommended Prerequisites: Placement into ENG 111

MTH 120 - Mathematical Explorations
Credit Hours: 3, **Contact Hours: 3**
Division: Science Math
This course is designed to meet the MTA graduation requirements in math for students whose programs of study have no further math requirements. This course is designed to develop quantitative reasoning skills as applied to personal and social issues. Topics will convey to the student the beauty and utility of mathematics, and its applications to modern society. Core topics include logic, models of growth (linear & exponential), personal finance, basic statistics and probability. Group 1 course. Quantitative Reasoning.
Required Prerequisites: A grade of 2.0 or better in MTH 23 or appropriate placement.
Recommended Prerequisites: High school algebra and geometry; Placement into ENG 111

MTH 121 - College Algebra
Credit Hours: 4, **Contact Hours: 4**
Division: Science Math
This course covers algebra topics including functions, mathematical models, solving equations algebraically and graphically, polynomial functions, logarithmic functions, exponential functions, inverse functions, and linear and non-linear systems of equations. Applications are integrated throughout. Group 1 course. Quantitative Reasoning.
Required Prerequisites: A grade of 2.0 or better in MTH 111 or higher (excluding MTH 120 and MTH 131) or appropriate placement.
Recommended Prerequisites: Placement into ENG 111

MTH 122 - Trigonometry
Credit Hours: 3, **Contact Hours: 3**
Division: Science Math
This course covers the definitions and graphic representations of the trigonometric functions. Triangles, angle measure, equations, identities, and inverse functions are discussed in detail. Law of Sines, Law of Cosines, and equations of the conic sections will also be covered. Group 1 course. Quantitative Reasoning.
Required Prerequisites: A grade of 2.0 or better in MTH 121 or higher (excluding MTH 131) or appropriate placement.
Recommended Prerequisites: Placement into ENG 111

MTH 131 - Intro to Prob & Stats
Credit Hours: 3, **Contact Hours: 3**
Division: Science Math
Descriptive statistics, experimental design, an introduction to probability concepts and inferential statistics are included in the course. Descriptive statistics includes graphs of both numerical and categorical data, measures of central tendency, and measures of variation. The normal density function, linear regression, and the binomial model are included. One and two sample problems involving confidence intervals and significance tests are studied for the sample mean and the sample proportion. Group 1 course. Quantitative Reasoning.
Required Prerequisites: A grade of 2.0 or better in MTH 111 or MTH 120 or higher or appropriate placement.
Recommended Prerequisites: Placement into ENG 111

MTH 141 - Calculus I
Credit Hours: 5, **Contact Hours: 5**
Division: Science Math
This is the first course in a traditional calculus sequence, emphasizing the development of the mathematical thought process. The topics covered include limits (definitions and limit proofs), continuity, derivatives of algebraic and trigonometric functions, applications of the derivative, the indefinite and definite integral, the fundamental theorem of calculus, and applications of integration. Group 1 course. Quantitative Reasoning.
Required Prerequisites: A grade of 2.0 or better in MTH 122 or higher (excluding MTH 131) or appropriate placement.
Recommended Prerequisites: Placement into ENG 111

MTH 142 - Calculus II
Credit Hours: 5, **Contact Hours: 5**
Division: Science Math
This course is a continuation of Calculus I. The topics include differentiation and integration involving exponential, logarithmic, and inverse trigonometric functions. There is an introduction of various integration methods. L'Hospital's Rule, improper integrals, parametric equations, polar coordinates, and infinite sequences and series are also investigated. Group 1 course. Quantitative Reasoning.
Required Prerequisites: A grade of 2.0 or better in MTH 141 or equivalent
Recommended Prerequisites: Placement into ENG 111

MTH 241 - Calculus III
Credit Hours: 5, **Contact Hours: 5**
Division: Science Math
The course covers multivariable calculus including three-dimensional analytical geometry, vector valued functions, partial differentiation, and multiple integration (with applications of each), and vector calculus. Group 1 course. Quantitative Reasoning.
Required Prerequisites: A grade of 2.0 or better in MTH 142 or equivalent
Recommended Prerequisites: Placement into ENG 111

MTH 251 - Differential Equations
Credit Hours: 4, **Contact Hours: 4**
Division: Science Math
This course introduces the concepts of differential equations. Topics include: solving first and second order differential equations, and systems of linear differential equations. Solutions are found using analytical, numerical, or graphical techniques relating to quantitative modeling. Laplace transforms and solving non-linear differential equations are introduced. Complex numbers and their usefulness in solving differential equations is identified. Linear algebra is introduced including the topics of; vector spaces, subspaces, spanning sets, linear dependence and independence, basis and dimensions, eigenvalues, eigenvectors, and linear transformations. Group 1 course. Quantitative Reasoning.
Required Prerequisites: A grade of 2.0 or better in MTH 142 or equivalent
Recommended Prerequisites: Placement into ENG 111