# Mathematics (MAT)

## Courses

**MAT-006. Elements of Algebra. 0 Credits.**
RECI 15 hrs LECT 30 hrs
Elements of Algebra integrates the fundamental operations of arithmetic and introductory Algebra. It is intended for students whose placement examination indicates a need for a review of arithmetic and basic Algebra skills. Topics include operations on whole numbers, fractions, decimals, percent and signed numbers, linear equations and inequalities in one variable, operations on polynomials, factoring, integer exponents, and graphing. The course incorporates a Support Lab where students will receive personal assistance with problems or questions assigned as homework to supplement the lectures.
**Prerequisites:** Appropriate score on a placement test or High School transcript evaluation (Multiple Measures) for recent graduates - Must be completed prior to taking this course.
**Additional Fees:** Course fee applies.

**MAT-007. Foundations of Algebra. 0 Credits.**
LECT 30 hrs
This course integrates selected topics of arithmetic and introductory algebra, including operations on whole numbers, fractions, decimals, percent and signed numbers, linear equations and inequalities in one variable, operations on polynomials, factoring, integer exponents, and graphing. Students are required to complete a series of laboratory assignments, which are designed to reinforce concepts based on the placement test results.
**Prerequisites:** Appropriate score on a placement test or High School transcript evaluation (Multiple Measures) for recent graduates - Must be completed prior to taking this course.

**MAT-009. Basic Mathematics Ia. 0 Credits.**
LECT 15 hrs
Three (3) hours per day for one week. This is an intensive one-week review of topics typically found on the computation placement test. A passing grade satisfies the Basic Mathematics requirement.
**Prerequisites:** Appropriate score on a placement test.

**MAT-00B. Prereq Albegra 1A. 3 Credits.**
LECT 45 hrs
Awardrd by taking college placement test.

**MAT-00R. Prereq Elem Alg. Recitation. 0 Credits.**
LECT hrs
Awarded by taking the college placement test.

**MAT-010. Basic Algebra 1A. 0 Credits.**
LECT 15 hrs
This is an intensive review of topics typically found on the basic algebra placement test. A passing grade satisfies the Basic Algebra requirement.
**Prerequisites:** Appropriate score on a placement test.

**MAT-016. Intermediate Algebra. 0 Credits.**
LECT 45 hrs
A second-level preparatory algebra course designed to prepare students for credit-level mathematics courses. Covered are selected topics, including systems of linear equations, polynomials, factoring, rational expressions, radicals and solving quadratic equations.
**Prerequisites:** MAT-006, MAT-007 MAT-010 or High School transcript evaluation (Multiple Measures) for recent graduates - Must be completed prior to taking this course.

**MAT-026. Intermediate Algebra Express. 0 Credits.**
RECI 15 hrs LECT 15 hrs
This is an intensive review of Intermediate Algebra in an express format (an alternative to MAT-016) designed for students who require a second-level preparatory Algebra before taking college level Mathematics courses. Covered are selected topics including systems of linear equations, polynomials, factoring, rational expressions, radicals and solving quadratic equations
**Prerequisites:** Appropriate score on a placement test or appropriate multiple measures placement.

**MAT-110. College Algebra. 3 Credits.**
LECT 45 hrs
An intensive course designed to prepare students for mathematics courses such as Calculus with Applications to Business and Economics and Precalculus. It covers selected algebra topics including exponents; rational expressions; polynomials, radicals, relations and functions; exponential and logarithmic functions, systems of equations.
**Prerequisites:** MAT-016, MAT-026 (grade C or better) or equivalent - Must be completed prior to taking this course.
**Additional Fees:** Course fee applies.

**MAT-113. Applied Calculus. 4 Credits.**
LECT 60 hrs
A study of topics which provides a basis for continuing courses in mathematics and the physical sciences. This course includes trigonometric, exponential and logarithmic functions; analytic geometry; differentiation and integration.
**Prerequisites:** MAT-110 or MAT-123 or equivalent
**Additional Fees:** Course fee applies.

**MAT-114. Introduction to Data Science. 3 Credits.**
LECT 45 hrs
Introduction to Data Science will provide students with data literacy skills in order to understand techniques in data manipulation, visualization and interpretation. This project based course will allow students to utilize a toolkit of statistical software to perform data science methods. Ethical issues related to data privacy, authenticity and security will be addressed alongside an introduction to artificial intelligence.
**Prerequisites:** MAT-016 or MAT-120 or equivalent.

**MAT-117. Mathematical Analysis for Business and Economics. 3 Credits.**
LECT 45 hrs
Mathematical topics used in business and economics with emphasis on applications. Covered are polynomials, linear and quadratic models, systems of equations, matrix algebra, and linear programming including the Simplex Method.
**Prerequisites:** MAT-016, MAT-026 (grade of C or better) or equivalent- Must be completed prior to taking this course.
**Additional Fees:** Course fee applies.

**MAT-118. Calculus With Application to Business And Economics. 3 Credits.**
LECT 45 hrs
A course covering functions, derivatives and integration, with special consideration of applications to the business and economics areas. Partial differentiation is introduced.
**Prerequisites:** MAT-110 (grade of C or better) or equivalent
**Additional Fees:** Course fee applies.

**MAT-120. Mathematics for Liberal Arts. 4 Credits.**
LECT 60 hrs
A course addressed to liberal arts students. Topics include the history of mathematics, probability, statistics, geometry, number theory, algebra, graphs and functions, and a choice of selected topics.
**Prerequisites:** MAT-006, MAT-007, MAT-010 or equivalent-Must be completed prior to taking this course.
**Additional Fees:** Course fee applies.

**MAT-123. Precalculus. 4 Credits.**
LECT 60 hrs
An intensive one-semester course to prepare students for Analytic Geometry and Calculus, including absolute values; relations; functions; equations; inequalities; polynomial, rational, trigonometric, inverse trigonometric, exponential and logarithmic functions; trigonometric equations and identities; and graphs.
**Prerequisites:** MAT-110 (grade of C or better) or equivalent
**Additional Fees:** Course fee applies.

**MAT-124. Statistics. 3 Credits.**
LECT 45 hrs
The fundamental principles of statistical methods. Descriptive statistics, correlation, regression, probability, binomial and normal distributions, sampling, elementary hypothesis testing, confidence intervals and ethical issues in statistics are included.STUDENTS WILL ONLY RECEIVE CREDIT FOR EITHER MAT-124 OR MAT-130.
**Prerequisites:** MAT-016, MAT-026, MAT-120 or equivalent-Must be completed prior to taking this course.
**Additional Fees:** Course fee applies.

**MAT-130. Probability and Statistics. 4 Credits.**
LECT 60 hrs
The fundamental principles of statistical methods. Descriptive statistics, correlation, regression, probability, binomial and normal distributions, sampling, hypothesis testing, confidence intervals and ethical issues in statistics are included. An introduction to the use of statistical software to analyze data will be emphasized.
**Prerequisites:** MAT-016, MAT-060 or MAT-120 or equivalent
**Additional Fees:** Course fee applies.

**MAT-131. Analytic Geometry and Calculus I. 4 Credits.**
LECT 60 hrs
The first semester of a three-semester sequence. Analytic geometry in the plane, differentiation and applications, and integration are covered.
**Prerequisites:** MAT-123 (grade of C or better) or equivalent - Must be completed prior to taking this course.

**MAT-132. Analytic Geometry and Calculus II. 4 Credits.**
LECT 60 hrs
A continuation of Analytic Geometry and Calculus I, which covers the calculus of inverse trigonometric functions, methods of integration, analytic geometry in the plane including polar coordinates and conic sections, hyperbolic functions, sequences and series, and parametric equations.
**Prerequisites:** MAT-131 (grade of C or better) or equivalent.

**MAT-140. Math for Radiographers. 1 Credit.**
LECT 15 hrs
This course discusses the math skills that are crucial in the healthcare environment. It teaches the basis measurements, calculations, percents, ratios, and proportions, scientific notation, metric conversions, basis algebraic principles and basic geometric principles used in Radiology. It reviews whole numbers, fractions, decimals and exponents. Radiology units and numeric prefixes are also discussed.
**Prerequisites:** MAT-016 or MAT-026 and admission to the Radiography program - Must be completed prior to taking this course.
**Corequisites:** RAD-100, RAD-104 and RAD-107.

**MAT-183. Probability and Statistics Honors. 4 Credits.**
LECT 60 hrs
An introduction to the principles of statistical methods. The course will integrate spreadsheet software to cover such topics as descriptive statistics, correlation, regression, probability, binomial and normal distributions, sampling, elementary hypothesis testing and confidence intervals. This course will also cover ethical issues in statistics. Comprehensive case studies will be covered throughout the semester. An introduction to the use of statistical software to analyze large data sets will be emphasized. GPA of 3.3 or higher, CCM Honors student or permission of CCM Honors is required to take this course.
**Prerequisites:** Permission of department chair or honors advisor
**Additional Fees:** Course fee applies.

**MAT-221. Internship Experience - Quantitative An alysis (45-100 Hours). 1 Credit.**
COOP 45 hrs
This course provides students with job training and practical experience in a work environment prior to permanent employment, amounting to between 45-100 hours in duration. Students will gain experience working with industry partners and developing both technology and soft skills required to work in a quantitative discipline such as a mathematician, statistician, or data scientist. Students will engage in the data science process that should consist of quantitative or statistical analysis in an industry setting. Students desiring to participate in this experience should make their intention known to the Department Chairperson or the Faculty Coordinator prior to the beginning of semester.
**Prerequisites:** CMP-131 or MAT-114 or MAT-130 or permission from department Chairperson.

**MAT-222. Internship Experience - Quantitative Ana lysis (90-200 Hours). 2 Credits.**
COOP 90 hrs
This course provides students with job training and practical experience in a work environment prior to permanent employment, amounting to between 90-200 hours in duration. Students will gain experience working with industry partners and developing both technology and soft skills required to work in a quantitative discipline such as a mathematician, statistician, or data scientist. Students will engage in the data science process that should consist of quantitative or statistical analysis in an industry setting. Students desiring to participate in this experience should make their intention known to the Department Chairperson or the Faculty Coordinator prior to the beginning of semester.
**Prerequisites:** CMP-131 or MAT-114 or MAT-130 or permission from department Chairperson.

**MAT-223. Internship Experience - Quantitative Ana lysis (135-300 Hours). 3 Credits.**
COOP 135 hrs
This course provides students with job training and practical experience in a work environment prior to permanent employment, amounting to between 135-300 hours in duration. Students will gain experience working with industry partners and developing both technology and soft skills required to work in a quantitative discipline such as a mathematician, statistician, or data scientist. Students will engage in the data science process that should consist of quantitative or statistical analysis in an industry setting. Students desiring to participate in this experience should make their intention known to the Department Chairperson or the Faculty Coordinator prior to the beginning of semester.
**Prerequisites:** CMP-131 or MAT-114 or MAT-130 or permission from department Chairperson.

**MAT-225. Discrete Mathematics. 4 Credits.**
LECT 60 hrs
This is a 4-credit course in discrete mathematics. It is offered to math & computer science majors in their first two years of study. The course outline shows it is an exposition of real-world and modern mathematics. Discrete Mathematics covers a breadth of unique topics in number theory, graph theory, set theory, probability and statistics, and propositional logic.
**Prerequisites:** MAT-131
**Additional Fees:** Course fee applies.

**MAT-228. Linear Algebra. 3 Credits.**
LECT 45 hrs
Selected topics including matrices and determinants, vectors and vector spaces, linear transformations, eigenvalues and eigenvectors, with applications from a variety of disciplines.
**Prerequisites:** MAT-131 (grade of C or better) or equivalent.

**MAT-230. Calculus III. 4 Credits.**
LECT 60 hrs
A continuation of Analytic Geometry and Calculus II which includes analytic geometry in three dimensions, functions of several variables, partial derivatives, multiple integrals, vectors and an introduction to vector analysis.
**Prerequisites:** MAT-132 (grade of C or better) or equivalent.

**MAT-232. Differential Equations. 3 Credits.**
LECT 45 hrs
Ordinary differential equations and methods of solution. Introduction to classical equations and their solutions, with some applications to geometry, physics and engineering.
**Prerequisites:** MAT-132 (grade of C or better) or equivalent.

**MAT-244. Ordinary Differential Equations. 4 Credits.**
LECT 60 hrs
A course in methods for solving ordinary differential equations. Introduction to classical equations and their solutions, physical applications, Laplace Transforms, numerical solutions, and Fourier Series.
**Prerequisites:** MAT-132 (grade of C or better) or equivalent.

**MAT-ELE. Mathematics Elective. 3-4 Credits.**
LECT 45 hrs
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