

MATHEMATICS (MTH)

Degree Requirements

MTH 102 General Education Statistics, MTH 104 General Education Mathematics, MTH 120 Statistics I, MTH 125 Finite Math for Business & Managmt, MTH 126 Calculus for Business/Social Science, MTH 190 Calculus with Analytic Geometry I, MTH 210 Calculus with Analytic Geometry II, and MTH 230 Calculus with Analytic Geometry III fulfill the mathematics requirement for the Associate in Arts, Associate in Science, and Associate in Fine Arts degrees.

MTH 190 Calculus with Analytic Geometry I, MTH 210 Calculus with Analytic Geometry II, MTH 230 Calculus with Analytic Geometry III, and MTH 250 Differential Equations fulfill the mathematics requirement for the Associate in Engineering Science degree.

MTH 113 Math for Elementary Teaching II fulfills the mathematics requirement for elementary education majors only for the AA degree.

All MTH courses numbered 100 and above may be applied to the area of concentration and elective requirement for the AA and AS degrees.

All MTH courses numbered 100 and above may be used to fulfill the math requirement for the Associate in Liberal Studies degree and the math/science requirement for the Associate of Applied Science degree.

Placement for Mathematics

Math requirements vary greatly based on a student's major, degree, or certificate. Choosing the correct math courses should be done with an ECC advisor.

Even though certain college readiness placement measures will exempt you from the ECC math placement test (ALEKS), you may still wish to take it to qualify for higher level math courses.

Refer to our [Testing Services](#) page to see which college readiness placement measure scores allow entrance into various Transfer-Level Mathematics Courses.

Transfer Sequences

Science, engineering, and mathematics majors should try to complete the sequence MTH 112 College Algebra, MTH 114 Trigonometry, MTH 190 Calculus with Analytic Geometry I, MTH 210 Calculus with Analytic Geometry II, MTH 230 Calculus with Analytic Geometry III, MTH 250 Differential Equations, and possibly MTH 240 Introduction to Linear Algebra, depending on their transfer institution's requirements. Entrance into this sequence depends on previous background in high school or college, and it may not be necessary to start at the beginning of the sequence.

Business and social sciences students should complete MTH 120 Statistics I, MTH 125 Finite Math for Business & Managmt, and/ or MTH 126 Calculus for Business/Social Science, depending on their transfer institution's requirements.

Questions on math course sequences may be determined by a conference with a member of the Mathematics Department or the advising staff.

Developmental Studies

MTH 090 Pre-Algebra, MTH 095 Preparatory Math for General Ed, MTH 096 Basic Algebra, MTH 097 Plane Geometry, MTH 098 Intermediate Algebra, and MTH 099 Combined Basic & Intermediate Algebra make it possible for students with skill deficiencies to prepare for regular college-level courses before or in conjunction with enrollment in college courses.

Developmental studies courses are distinguished from other courses by a prefix code numbered below 100. They are not intended for transfer and cannot be used to fulfill the requirements of any associate degree.

MTH 090 Pre-Algebra (3) 3,0

This course is designed as a review of the basic operations of arithmetic and an introduction to algebra. The emphasis is on operations with fractions, decimals, percents, and signed numbers. It is intended for the student who needs a review of arithmetic and prealgebra skills. This course precedes technical math or beginning algebra. (1.4) Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$406 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: None

Semester(s) Offered: Fall, Spring and Summer

MTH 095 Preparatory Math for General Ed (6) 6,0

This is a preparatory course for general education mathematics. Numeracy, algebraic reasoning, and modeling are used in problem solving and mathematical analysis. Concepts, techniques, and manipulations are developed in real-world context. Verbal, numerical, symbolic, and graphical representations are related to establish mathematical literacy. Topics include organizing and analyzing data; dimensional analysis; properties of and operations on polynomials; evaluating, graphing, and modeling with linear, quadratic, and exponential functions; solving equations and systems of equations; and basic geometry. Technology is used to make concepts more accessible. Collaborative learning and group work are used extensively. (1.4) Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$802 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Grade of C or better in MTH 090 or appropriate placement score.

Semester(s) Offered: Fall and Spring

MTH 096 Basic Algebra (4) 4,0

This course is designed to be a first course in algebra. Although emphasis is placed on techniques and manipulations, problem-solving and logical reasoning are main threads throughout the course. Topics include: operations and properties of real numbers; linear equations and inequalities in one and two variables; systems of linear equations in two variables; operations with polynomials including factoring; polynomial equations; and applications. Additionally, the course includes study skills strategies. (1.4) Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$538 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Grade of C or better in MTH 090 or appropriate placement test score

Semester(s) Offered: Fall, Spring and Summer

MTH 097 Plane Geometry (3) 3,0

Plane geometry is a one-semester course which covers the fundamental concepts of geometry for students who lack credit in one year of high school geometry or need a review of the subject matter. This course is designed to prepare students for further work in mathematics and many math-related fields. The subject is developed in the context of a logical system with constructions, numerical problems, symbolic and graphical representations, deductive reasoning, algebraic concepts; geometric theorems, integrating problem-solving and applications throughout the course. (1.4) Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$406 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Math: Grade of C or better in MTH 095 or MTH 096, or satisfaction of other placement criteria.+

Semester(s) Offered: Fall, Spring and Summer

MTH 098 Intermediate Algebra (4) 4,0

This course is designed to be a second course in Algebra. Although emphasis is placed on techniques and manipulations, problem-solving and logical reasoning are main threads throughout the course. Topics include: factoring polynomials; absolute value equations and inequalities; rational and radical expressions and equations; complex numbers; quadratic and polynomial equations; properties of functions and their graphs, including polynomial and exponential functions; and applications. (1.4) Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$538 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Math: Grade of C or better in MTH 095 or MTH 096, or satisfaction of other placement criteria.+

Semester(s) Offered: Fall, Spring and Summer

MTH 099 Combined Basic & Intermediate Algebra (6) 6,0

This course is designed to be a combination of basic and intermediate algebra. Although emphasis is placed on techniques and manipulations, problem-solving and logical reasoning are main threads throughout the course. Topics include: operations and properties of real numbers; linear equations and inequalities in one and two variables; systems of linear equations in two variables; operations of polynomials including factoring; absolute value equations and inequalities; rational and radical expressions and equations; complex numbers; quadratic and polynomial equations; properties of functions and their graphs, including polynomial and exponential functions; and applications. (1.4) Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$802 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Appropriate placement test score

Semester(s) Offered: Fall and Spring

MTH 102 General Education Statistics (3) 3,0

An introductory course in descriptive and inferential statistics for students in liberal arts and health related fields. Applications and concepts are emphasized rather than theoretical formulations. Calculators and computers will be used to help make statistical ideas more accessible to students. (1.1) Fulfills the ECC/IAI General Education/Mathematics requirement. IAI Course Number: M1 902 Proficiency Credit Available (2 C) Pass/No Credit Not Available.

In-District Tuition/Fees: \$406 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Math: Grade of C or better in MTH 095, MTH 098, or MTH 099 or satisfaction of other placement criteria or (2) Placement into MTH 098 and a minimum high school un-weighted GPA of 3.0/4.0 with a grade of C or better in two semesters of second year high school algebra. Reading: Grade of C or better in RDG 091 or LTC 099, or satisfaction of other placement criteria.+

Semester(s) Offered: Fall, Spring and Summer

MTH 104 General Education Mathematics (3) 3,0

This course focuses on mathematical reasoning and the solving of real-life problems, rather than on routine skills and appreciation. Finance, statistics, and mathematical modeling are studied in depth, with voting theory covered as time permits. The use of computers is required. (1.1) Fulfills the ECC/IAI General Education/Mathematics requirement. IAI Course Number: M1 904 Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$406 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Prerequisite: Math: Grade of C or better in MTH 095 or MTH 098 or MTH 99, or satisfaction of other placement criteria. (2) a minimum high school un-weighted GPA of 3.0/4.0 with a grade of C or better in two semesters of second year high school algebra. Reading: Grade of C or better in RDG 091 or LTC 099, or satisfaction of other placement criteria.+

Semester(s) Offered: Fall, Spring and Summer

MTH 107 Technical Math I (4) 4,0

The course emphasizes the mathematical knowledge needed to be successful in the workplace, including number systems, geometry, algebra, and trigonometry. Students will engage in problem-solving activities using real-world career examples that help students learn not only the needed mathematical skills, but also how those skills are used in specific fields of interest. Special Note: This course is offered concurrently as IMT 107. The student must decide whether to earn credits in Mathematics (MTH) or Industrial Manufacturing Technology (IMT) prior to enrolling. (1.2) Proficiency Credit Available Pass/No Credit Not Available NOTE: This course is offered concurrently as MTH 107 and IMT 107. The student must decide whether to earn credits in Mathematics (MTH) or Industrial Manufacturing Technology (IMT) prior to enrolling.

In-District Tuition/Fees: \$533 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Effective Summer 2020 Grade of C or better in MTH 090, consent of instructor, or appropriate score on placement test

Prerequisite: MTH 090, consent of instructor, or appropriate score on placement test

Semester(s) Offered: Fall and Spring

MTH 109 Technical Math II (4) 4,0

Continuation of MTH 107 Technical Mathematics I and an introduction to further methods used in mathematics problem solving needed for technology. (1.2) Proficiency Credit Available Pass/No Credit Not Available NOTE: This course is offered concurrently as MTH 109 and IMT 111. The student must decide whether to earn credits in Mathematics (MTH) or Industrial Manufacturing Technology (IMT) prior to enrolling.

In-District Tuition/Fees: \$528 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Grade of C or better in MTH 107 or IMT 107 or consent of instructor

Semester(s) Offered: Fall and Spring

MTH 110 Math for Elementary Teaching I (3) 3,0

The first course of a two-part sequence that meets the requirements for state certification in elementary teaching. Problem-solving and mathematical reasoning are main threads throughout the course. The course content includes: whole numbers, integers, rational numbers, sets, reasoning, numeration systems, number theory, and real numbers. Course pedagogy involves students as active participants in the learning process. The two-course sequence, MTH 110/113, fulfills the Illinois Transferable General Education Core Curriculum requirement only for students seeking state certification as elementary teachers or special education teachers. (1.1) Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$406 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Math: Grade of C or better in MTH 098 or MTH 099, or satisfaction of other placement criteria.(2) placement into MTH 098 and a minimum high school un-weighted GPA of 3.5/4.0 with a grade of C or better in two semesters of second year high school algebra. Geometry: (1) grade of C or better in MTH 097; or (2) appropriate score on geometry placement test; or (3) grade of C or better in two semesters of high school geometry. Reading: Grade of C or better in RDG 091 or LTC 099, or satisfaction of other placement criteria.

Semester(s) Offered: Fall, Spring and Summer

MTH 112 College Algebra (4) 4,0

Study of more advanced algebraic theory and techniques required for the study of calculus. Topics include: properties of functions and their graphs; classes of functions including polynomial, rational, exponential and logarithmic; systems of equations; theory of equations; conic sections; sequences, series, and binomial expansion. (1.1) Proficiency Credit Available (2 C) Pass/No Credit Not Available.

In-District Tuition/Fees: \$538 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Math: Grade of C or better in MTH 098 or MTH 099, or satisfaction of other placement criteria. (2) placement into MTH 098 and a minimum high school un-weighted GPA of 3.0/4.0 with a grade of C or better in two semesters of second year high school algebra. Geometry: (1) grade of C or better in MTH 097; or (2) appropriate score on geometry placement test; or (3) grade of C or better in two semesters of high school geometry. Reading: Grade of C or better in RDG 091 or LTC 099, or satisfaction of other placement criteria.+

Semester(s) Offered: Fall, Spring and Summer

MTH 113 Math for Elementary Teaching II (3) 3,0

The second course of a two-part sequence that meets the requirements for state certification in elementary teaching. Problem-solving and mathematical-reasoning are main threads throughout the course. The course content includes: functions, statistics, probability, geometric figures, and measurement. Course pedagogy involves students as active participants in the learning process. The two-course sequence, MTH 110/113, fulfills the Illinois Transferable General Education Core Curriculum requirement only for students seeking state certification as elementary teachers or special education teachers. (1.1) Fulfills the ECC/IAI General Education/Mathematics requirement for elementary education majors only. IAI Course Number: M1 903 Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$406 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Reading: Grade of C or better in RDG 091 or LTC 099, or satisfaction of other placement criteria. Math: Grade of C or better in MTH 110.+

Semester(s) Offered: Fall, Spring and Summer

MTH 114 Trigonometry (3) 3,0

The primary objective of this course is to prepare students for calculus and post-calculus courses. Topics include analytical geometry, trigonometric functions, trigonometric identities, inverse trigonometric functions, and solving trigonometric equations. (1.1) Proficiency Credit Available (3 C) Pass/No Credit Not Available.

In-District Tuition/Fees: \$406 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Grade of C or better in MTH 112 or appropriate placement test score Concurrent enrollment in MTH 112 with consent of instructor Reading: Grade of C or better in RDG 091 or LTC 099, or satisfaction of other placement criteria.+

Semester(s) Offered: Fall, Spring and Summer

MTH 120 Statistics I (4) 4,0

An introductory course in probability and statistics. The ability to handle basic algebraic manipulation is a prerequisite skill. The emphasis of the course is on the use rather than the derivation of the formulas and theorems. The aims of the course are to provide the student with a working knowledge of statistics in order to follow the statistics in the literature of his/her particular field and to provide an introduction for more advanced work in statistics. Major topics are: frequency distributions, sampling, testing hypotheses, regression, correlation, analysis of variance, chi-square, and probability. These and other topics are approached from a fundamental viewpoint to make the study both sound and useful. (1.1) Fulfills the ECC/IAI General Education/Mathematics requirement. IAI Course Number: M1 902 IAI Major: BUS 901 Proficiency Credit Available (2 C) Pass/No Credit Not Available.

In-District Tuition/Fees: \$538 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Reading: Grade of C or better in RDG 091 or LTC 099, or satisfaction of other placement criteria. Math: Grade of C or better in MTH 112 or satisfaction of other placement criteria; and grade of C or better in MTH 097 or grade of C or better in two semesters of high school geometry or appropriate score on the geometry placement test.+

Semester(s) Offered: Fall, Spring and Summer

MTH 123 Computer Science for Engineers (4) 4,0

This course is an introduction to computer programming with a strong emphasis on mathematical applications relevant to science and engineering. Students will learn a disciplined approach to problem-solving and algorithm development using selection, repetition, and sequence control structures. Programming topics will include an introduction to basic hardware and operating systems, storage and variables, procedural and data abstraction, parameter passing, arrays, strings, data files, error-handling, program-testing, documentation, and proper programming style. Mathematical topics will include matrices, linear interpolation, convergence, linear regression, roots of functions, solution of simultaneous linear equations, graphing, and numerical integration. This course will be taught using the C++ programming language. (1.1) IAI Major: CS 911 Proficiency Credit Not Available Pass/No Credit Not Available Note: This course is offered concurrently as CIS 123. The student must decide whether to earn credits in Mathematics (MTH) or Computer and Information Sciences (CIS) prior to enrolling.

In-District Tuition/Fees: \$553 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Effective Summer 2021 Grade of C or better in MTH 190 or consent of instructor. Prerequisite: Grade of C or better in MTH 190 or equivalent college credit or consent of instructor

Semester(s) Offered: Fall and Spring

MTH 125 Finite Math for Business & Managmt (3) 3,0

Emphasizes applications of mathematics in business and the social sciences. Topics include functions, graphical and algebraic methods for solving systems of linear equations, matrices and matrix algebra, systems of inequalities and linear programming, the simplex method, spreadsheet solutions to linear programming problems, set theory, logic and Boolean algebra, counting and probability theory, and Markov chain methods. (1.1) Fulfills the ECC/IAI General Education/Mathematics requirement. IAI Course Number: M1 906 Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$406 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Reading: Grade of C or better in RDG 091 or LTC 099, or satisfaction of other placement criteria. Math: Grade of C or better in MTH 112 or satisfaction of other placement criteria.; and grade of C or better in MTH 097 or grade of C or better in two semesters of high school geometry or appropriate score on the geometry placement test.+

Semester(s) Offered: Fall, Spring and Summer

MTH 126 Calculus for Business/Social Science (4) 4,0

An introductory course in differential and integral calculus for students majoring in business, or the social or life sciences. A working, rather than a theoretical knowledge of calculus concepts and applications is emphasized. (1.1) Fulfills the ECC/IAI General Education/Mathematics requirement. IAI Course Number: M1 900-B Proficiency Credit Available (2 C) Pass/No Credit Not Available.

In-District Tuition/Fees: \$538 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Reading: Grade of C or better in RDG 091 or LTC 099, or satisfaction of other placement criteria. Math: Grade of C or better in MTH 112 or satisfaction of other placement criteria; and grade of C or better in MTH 097 or grade of C or better in two semesters of high school geometry or appropriate score on the geometry placement test.+

Semester(s) Offered: Fall, Spring and Summer

MTH 190 Calculus with Analytic Geometry I (5) 5,0

This is the first of three courses in the calculus sequence. Families of functions include polynomial, rational, radical, trigonometric, inverse trigonometric, exponential, and logarithmic. Topics include limits and continuity; the definition of derivative, rate of change, and slope; differentiation including product, quotient, chain rules, higher order derivatives, and implicit differentiation; applications of derivatives including extrema, Mean Value Theorem, first and second derivative tests, related rates, optimization, and differentials; integration including definite and indefinite integration, area, The Fundamental Theorem of Calculus, and differential equations. (1.1) IAI General Education: M1 900-1 IAI Major: MTH 901 Proficiency Credit Available (2 C) Pass/No Credit Not Available.

In-District Tuition/Fees: \$670 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Reading: Grade of C or better in RDG 091 or LTC 099, or satisfaction of other placement criteria. Math: Grade of C or better in MTH 112 and MTH 114 or appropriate placement test score.+

Semester(s) Offered: Fall, Spring and Summer

MTH 210 Calculus with Analytic Geometry II (5) 5,0

This is the second of three courses in the calculus sequence. Topics include applications of integration, analytical integration techniques, and numerical integration techniques; indeterminate forms, L'Hopital's Rule, and improper integrals; sequences and series, convergence tests, power series, Taylor polynomials, and Taylor series; parameterization of curves, and calculus of parametric curves; calculus of polar coordinate system, and conic sections. (1.1) Fulfills the ECC/IAI General Education/Mathematics requirement. IAI Course Number: M1 900-2 IAI Major: MTH 902 Proficiency Credit Available (2 C) Pass/No Credit Not Available.

In-District Tuition/Fees: \$670 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Prerequisite:Reading: Grade of C or better in RDG 091 or LTC 099, or satisfaction of other placement criteria. Math: Grade of C or better in MTH 190 or equivalent college credit.+

Semester(s) Offered: Fall, Spring and Summer

MTH 230 Calculus with Analytic Geometry III (5) 5,0

Third and final course in the calculus sequence. Topics include the following: vectors in 2 an 3 dimensions; planes and lines in space, surfaces and quadric surfaces, space curves; cylindrical and spherical coordinates; vector-valued functions and their graphs; functions of two or more variable; partial derivatives, directional derivatives, gradients; double and triple integrals; applications involving functions of several variables; vector fields, line integrals and Green's Theorem; parametric surfaces, surface integrals, the Divergence Theorem and Stokes' Theorem. (1.1) Fulfills the ECC/IAI General Education/Mathematics requirement. IAI Course Number: M1 900-3 IAI Major: MTH 903 Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$670 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Reading: Grade of C or better in RDG 091 or LTC 099, or satisfaction of other placement criteria. Math: Grade of C or better in MTH 210.+

Semester(s) Offered: Fall, Spring and Summer

MTH 240 Introduction to Linear Algebra (4) 4,0

First course in vectors and matrices, vector spaces, and linear transformations. The ideas discussed not only serve as a good introduction to the more abstract courses a mathematics student meets at the junior-senior level, but they also have many useful applications outside of mathematics. Covers the following topics: vectors, matrices, operations on matrices, inverse of a matrix, solutions of systems of linear equations, rank of a matrix, vector spaces and subspaces, linear dependence and independence, basis and dimension, linear transformations, sums, composites, inverses of linear transformations, range and kernel of a linear transformation, and eigenvalues and eigenvectors, diagonalization, inner products and orthogonality, including the Gram-Schmidt process. Material is presented with an emphasis on student-written proofs. Quadratic forms and other additional topics could be included, as time permits. (1.1) IAI Major: MTH 911 Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$538 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Grade of C or better in MTH 210

Semester(s) Offered: Spring and Summer

MTH 250 Differential Equations (4) 4,0

Topics include linear equations of first order, linear equations with constant coefficients, general linear differential equations, variation of parameters, the method of undetermined coefficients, linear independence and the Wronskian, exact equations, separation of variables, and various applications of these. In addition, the course covers systems of linear differential equations, the Laplace transform, series methods in solving differential equations, and an introduction to boundary value problems. (1.1) IAI Major: MTH 912 Proficiency Credit Not Available Pass/No Credit Not Available.

In-District Tuition/Fees: \$538 (effective 2021/22 academic year)

In-district tuition rates are subject to change based on Board approval.

Prerequisite: Grade of C or better in MTH 230

Semester(s) Offered: Fall, Spring and Summer