

**MTH Mathematics**

**MTH 055 Basic Mathematics (1-0 to 3-0) 1-3 crs.**

Consists of three modules. Module A: The Whole Numbers; Module B: Fractions and Decimals; Module C: Ratios and Change. Module A includes an understanding of whole numbers; addition, subtraction, multiplication, and division of whole numbers; estimation; exponents and square roots; factors and multiples; prime numbers. Module B includes the definition of fractions; equivalent fractions; decimal fractions and decimal notation; mixed numbers; addition, subtraction, multiplication, and division of fractions, mixed numbers, and decimals. Module C includes ratios and rates; proportions; percents; percent change; signed numbers; addition, subtraction, multiplication, and division of signed numbers. Carries no transfer credit.

**Prerequisite:** Placement options. [https://www.harpercollege.edu/registration/testing/pdf/Math\\_Placement\\_Grid.pdf](https://www.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid.pdf)

**MTH 065 Algebraic Modeling (4-0) 4 crs.**

Develops conceptual understanding of number systems, algebraic expressions, equations, inequalities and graphs of equations. Develops algebra skills with an emphasis on data modeling throughout the course. Carries no transfer credit.

**Prerequisite:** MTH 055 (Basic Mathematics) with a grade of C or better or P, or other placement options. [https://www.harpercollege.edu/registration/testing/pdf/Math\\_Placement\\_Grid.pdf](https://www.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid.pdf)

**MTH 070 Plane Geometry (3-0) 3 crs.**

Introduces concepts of Euclidean plane geometry, including lines, angles, polygons and circles. Carries no transfer credit.

**Prerequisite:** MTH 065 (Algebraic Modeling) with a grade of C or better, or other placement options. [https://www.harpercollege.edu/registration/testing/pdf/Math\\_Placement\\_Grid.pdf](https://www.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid.pdf)

**MTH 075 Review of Developmental Algebra and Geometry (0-2) 1 cr.**

Reviews the topics of elementary and intermediate algebra and geometry as needed with the goal of improving the student's mathematics placement scores. Carries no transfer credit.

**Prerequisite:** None.

**MTH 080 Intermediate Algebra (4-0) 4 crs.**

Introduces fundamental concepts of algebra including polynomial and rational expressions; radical expressions; complex numbers; and functions that are linear, quadratic, exponential, and logarithmic. Credits earned in this course cannot be applied toward an Associate in Arts or Associate in Science degree. Carries no transfer credit.

**Prerequisite:** MTH 065 (Algebraic Modeling) with a grade of C or better or other placement options. [https://www.harpercollege.edu/registration/testing/pdf/Math\\_Placement\\_Grid.pdf](https://www.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid.pdf)

**MTH 081 Supplemental Math/Quantitive Literacy (1-0) 1 cr.**

Provides mathematical support for students in MTH 101 who place at the Intermediate Algebra level. Carries no transfer credit.

**Prerequisite:** MTH 065 (Algebraic Modeling) with a grade of C or better, or other placement options. [https://www.harpercollege.edu/registration/testing/pdf/Math\\_Placement\\_Grid.pdf](https://www.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid.pdf)  
**Corequisite:** MTH 101.

**MTH 083 Supplemental Math/College Algebra (2-0) 2 crs.**

Provides mathematical support for students in MTH 103 (College Algebra) who place at the upper MTH 080 (Intermediate Algebra) level. Carries no transfer credit.

**Prerequisite:** See placement options. [https://www.harpercollege.edu/registration/testing/pdf/Math\\_Placement\\_Grid.pdf](https://www.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid.pdf)

**Corequisite:** MTH 103.

**MTH 085 Supplemental Math/Elementary Statistics (1-0) 1 cr.**

Provides mathematical support for students in MTH 165 (Elementary Statistics) who place at the Intermediate Algebra level.

**Prerequisite:** MTH 065 (Algebraic Modeling) with a grade of C or better, or other placement options. [https://www.harpercollege.edu/registration/testing/pdf/Math\\_Placement\\_Grid.pdf](https://www.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid.pdf)

**Corequisite:** MTH 165.

**MTH 097 Basic Technical Mathematics (3-0) 3 crs.**

Reviews arithmetic, introduces basic algebraic and right triangle trigonometric techniques. Includes arithmetic, elementary algebra, geometry, ratio and proportions, measurements, right triangle trigonometry and their application to solve a variety of career and technical problems. Draws practical problems the student's career area, including emergency services, graphic communications, building trades, culinary arts and information technology. Intended for students pursuing Harper degrees and certificates in career program fields. This course: is not transferable, does not satisfy the prerequisite for any other mathematics course, and does not satisfy any general education requirements.

**MTH 101 Quantitative Literacy (4-0) 4 crs.**

Develops conceptual understanding, problem-solving, decision-making and analytic skills dealing with quantities and their magnitudes and interrelationships, using calculators and personal computers as tools. Includes: computing statistical measures such as central tendency and dispersion; computing correlation coefficients and regression equations; using normal distributions to test hypotheses; using logical statements and arguments in a real-world context; solving systems of equations and inequalities and modeling data; solving mathematical finance problems; and selecting and using appropriate approaches and tools in formulating and solving real-world problems. IAI M1 901

**Prerequisite:** MTH 080 (Intermediate Algebra) with a grade of C or better or other placement options. MTH 065 (Algebraic Modeling) with a grade of C or better is an acceptable prerequisite if MTH 081 is taken concurrently with MTH 101. [https://www.harpercollege.edu/registration/testing/pdf/Math\\_Placement\\_Grid.pdf](https://www.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid.pdf)

**MTH 103 College Algebra (3-0) 3 crs.**

Emphasizes algebraic and graphical approaches. Topics include but are not limited to polynomial functions, rational functions, exponential functions, logarithmic functions and systems of equations. NOTE: This course does not fulfill the math requirement for the AA or AS degrees.

**Prerequisite:** MTH 070 (Plane Geometry) AND MTH 080 (Intermediate Algebra) with grades of C or better or other placement options. [https://www.harpercollege.edu/registration/testing/pdf/Math\\_Placement\\_Grid.pdf](https://www.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid.pdf)

**MTH 124 Finite Mathematics (3-0) 3 crs.**

Develops the mathematics of simple models in behavioral, social and management sciences. Studies applications of set theory, vectors and matrices, linear programming, probability rules, and Markov chains with computer assistance. IAI M1 906

**Prerequisite:** MTH 103 (College Algebra) with a grade of C or better or other placement options. [https://www.harpercollege.edu/registration/testing/pdf/Math\\_Placement\\_Grid.pdf](https://www.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid.pdf)

**MTH 130 Mathematics for Elementary Teaching I (3-2) 4 crs.**

Focuses on mathematical reasoning and problem solving and is designed to meet the requirements of the state certification of elementary teachers when taken in conjunction with MTH 131. The course examines the underlying conceptual framework of the topics of sets, functions, whole numbers, number theory, integers, rational numbers, irrational numbers and the real number system. Students are expected to be active participants in the learning process. They will apply mathematical reasoning in a variety of problem-solving situations using estimation, models, tables, graphs and symbolic representations. The use of appropriate techniques and tools, such as calculators and computers, are a focus of investigations and discussion throughout the course. A weekly lab component is required.

**Prerequisite:** MTH 070 (Plane Geometry) and MTH 080 (Intermediate Algebra) with grades of C or better, or other placement options. [https://www.harpercollege.edu/registration/testing/pdf/Math\\_Placement\\_Grid.pdf](https://www.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid.pdf)

**MTH 131 Mathematics for Elementary Teaching II (3-2) 4 crs.**

Completes the two course sequence that begins with MTH 130 and focuses on mathematical reasoning and the solving of real-life problems, rather than on routine skills. The following topics will be studied in depth: geometry, counting techniques and probability, logic and statistics. Students are expected to be active participants in the learning process. Calculators and computers will be used throughout the course. A weekly lab component is required. IAI M1 903

**Prerequisite:** MTH 130 (Mathematics for Elementary Teaching I) with a grade of C or better.

**MTH 134 Calculus for Social Scientists (4-0) 4 crs.**

Develops an intuitive approach to concepts of differential and integral calculus. Applies these concepts to problems in social, behavioral and management sciences. Not for physical science or mathematics majors. IAI M1 900-B

**Prerequisite:** MTH 103 (College Algebra) with a grade of C or better, or other placement options. [https://www.harpercollege.edu/registration/testing/pdf/Math\\_Placement\\_Grid.pdf](https://www.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid.pdf)

**MTH 140 Precalculus (5-0) 5 crs.**

Builds on MTH 103 (College Algebra) to provide the foundation for calculus and analytic geometry. Topics include but are not limited to radical and rational equations; equations quadratic in form; polynomial and rational functions; polynomial and rational inequalities; sequences and series; mathematical induction; the binomial theorem; trigonometric functions; inverse trigonometric functions; applications of trigonometric functions; polar coordinates and vectors; and the complex plane.

**Prerequisite:** MTH 103 (College Algebra) with a grade of C or better, or other placement options. [http://goforward.harpercollege.edu/registration/testing/pdf/Math\\_Placement\\_Grid\\_17\\_18.pdf](http://goforward.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid_17_18.pdf)

**MTH 165 Elementary Statistics (4-0) 4 crs.**

Focuses on mathematical reasoning and the solving of real-life problems in statistics, rather than on routine skills. Includes analysis of data using sample statistics, basic probability theory, probability distributions (normal and binomial), sampling distributions of means and proportions, statistical inference (estimation, hypothesis testing, t-test and chi-square test, and errors), correlation and regression, F-test and analysis of variance. Computer labs using statistical software packages are incorporated throughout course. (Credit will be given for either MTH 162 or MTH 165 or MGT 225, but not all.) IAI M1 902

**Prerequisite:** MTH 080 (Intermediate Algebra) with a grade of C or better, or other placement options. MTH 065 (Algebraic Modeling) with a grade of C or better is an acceptable prerequisite if MTH 085 (Supplemental Math/Elementary Statistics) is taken concurrently with MTH 165. [https://www.harpercollege.edu/registration/testing/pdf/Math\\_Placement\\_Grid.pdf](https://www.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid.pdf)

**MTH 200 Calculus I (5-0) 5 crs.**

Studies limits, continuity, derivatives, antiderivatives, and definite integrals as they relate to algebraic, trigonometric, inverse trigonometric, logarithmic and exponential functions. Includes applications to geometry, science, and engineering. IAI M1 900-1, IAI MTH 901

**Prerequisite:** MTH 140 (Precalculus) with a grade of C or better, or other placement options. [http://goforward.harpercollege.edu/registration/testing/pdf/Math\\_Placement\\_Grid\\_17\\_18.pdf](http://goforward.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid_17_18.pdf)

**MTH 201 Calculus II (5-0) 5 crs.**

Continues MTH 200. Uses integrals to describe area and volume, studies techniques of integration, series, conics, polar coordinates and parametric equations with applications to science and engineering. IAI M1 900-2, IAI MTH 902

**Prerequisite:** MTH 200 (Calculus I) with a grade of C or better, or other placement options. [https://www.harpercollege.edu/registration/testing/pdf/Math\\_Placement\\_Grid.pdf](https://www.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid.pdf)

**MTH 202 Calculus III (5-0) 5 crs.**

Continues MTH 201. Studies three-dimensional vectors, solid analytic geometry, vector-valued functions, partial derivatives, multiple integrals, Green's theorem, surface integrals, divergence theorem and Stoke's theorem. IAI M1 900-3, IAI MTH 903

**Prerequisite:** MTH 201 (Calculus II) with a grade of C or better, or other placement options. [https://www.harpercollege.edu/registration/testing/pdf/Math\\_Placement\\_Grid.pdf](https://www.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid.pdf)

**MTH 203 Linear Algebra (4-0) 4 crs.**

Introduces matrices, vector spaces and linear transformations. Serves as a first exposure to abstract mathematical structures. Include matrices and their operations, determinants, solutions of systems of linear equations, Euclidean and general vector spaces, bases and dimension, linear transformations and their associated subspaces, eigenvalues and eigenvectors. Discusses applications to mathematics, computer graphics, and physical sciences. IAI MTH 911

**Prerequisite:** MTH 201 (Calculus II) with a grade of C or better.

**MTH 212 Differential Equations (3-0) 3 crs.**

Continues MTH 202. Emphasizes solutions of first order differential equations, linear differential equations, special second order equations and series solutions. Studies selections from these topics: LaPlace transforms, Fourier series, numerical methods and applications of matrix algebra. IAI MTH 912

**Prerequisite:** MTH 202 (Calculus III) with a grade of C or better.

**MTH 220 Discrete Mathematics (3-0) 3 crs.**

Introduces analysis of finite collections and mathematical foundations of sequential machines, computer system design, data structures and algorithms. Includes sets and logic, subscripts, arrays, number systems, counting, recursion, graph theory, trees, networks and Boolean algebra. IAI M1 905, IAI CS 915

**Prerequisite:** MTH 103 (College Algebra) with a grade of C or better, or other placement options. [https://www.harpercollege.edu/registration/testing/pdf/Math\\_Placement\\_Grid.pdf](https://www.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid.pdf)

**MTH 225 Business Statistics (4-0) 4 crs.**

Focuses on the use of statistical concepts as decision-making tools with an emphasis on business-related applications. Topics include descriptive statistics, probability theory, and inferential methods including chi-square tests, regression analysis, and ANOVA. This course is strongly recommended for business majors. You may not receive credit for more than one of MTH 225 OR MTH 165 OR MTH 162 OR MGT 225. (IAI M1 902/IAI BUS 901)

**Prerequisite:** MTH 103 (College Algebra) with a grade of C or better, or other placement options (including meeting the Geometry requirement). [https://www.harpercollege.edu/registration/testing/pdf/Math\\_Placement\\_Grid.pdf](https://www.harpercollege.edu/registration/testing/pdf/Math_Placement_Grid.pdf)