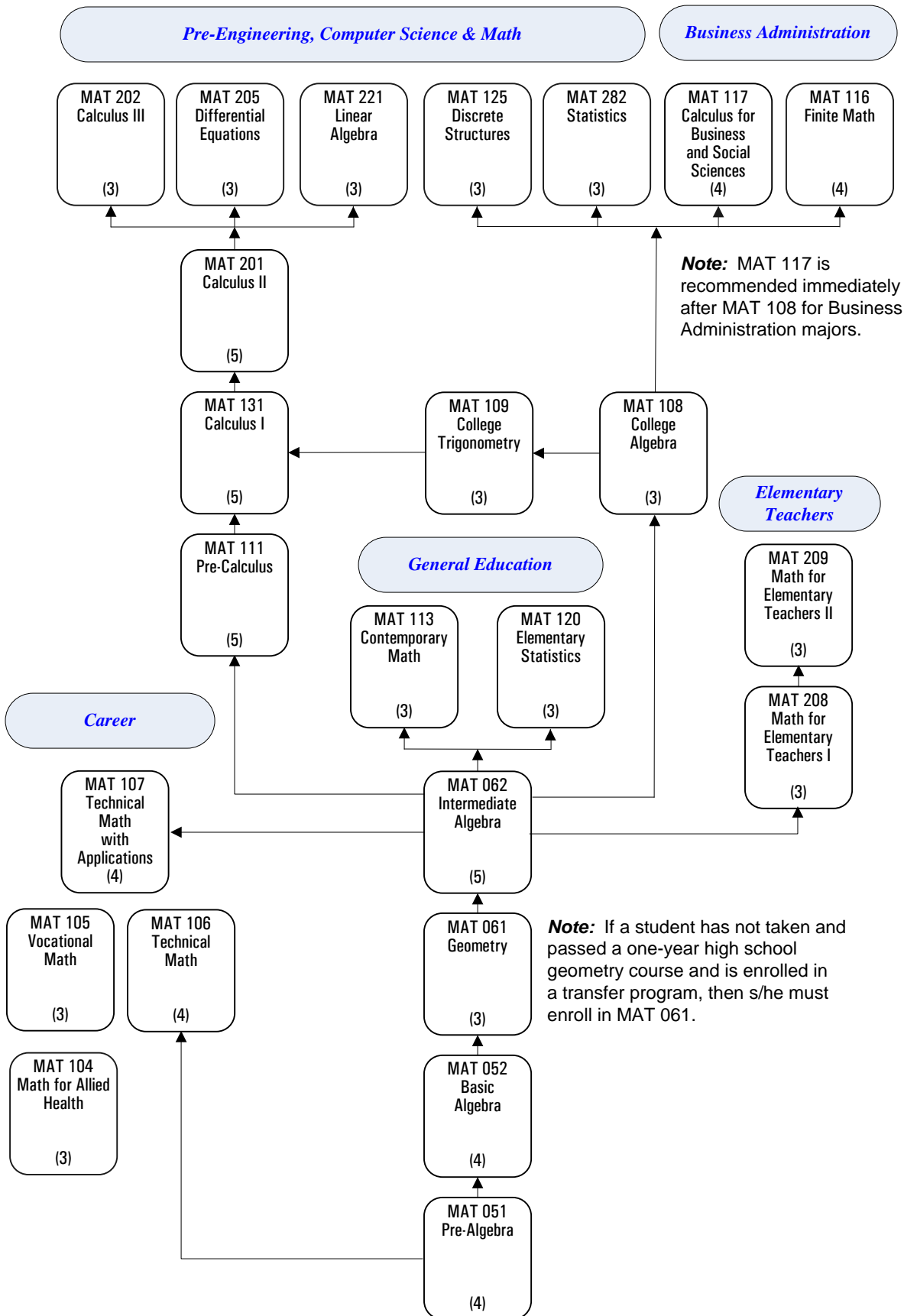




John A. Logan College
Mathematics Sequences

Student is counseled to enter at the highest level appropriate to both ability and choice of program.
Number of semester hours of credit is shown in parenthesis.



Mathematics (MAT)

MAT 051 Pre-Algebra

4 Hours

Prerequisites: None
4 hours weekly (4-0)

MAT 051 is designed as a review of the basic operations of arithmetic and an introduction to algebra. The student must earn a grade of "C" or higher in order to enroll in MAT 052. In addition, the student will need to enroll in MAT 052, MAT 061, and MAT 062 before progressing to transfer-level mathematics courses. This course will cover the integers, fractions and decimals; ratio, proportion and percent; prime numbers, factoring; exponents; and solving equations.

This is a developmental course which is used to calculate GPA at John A. Logan College, but does not transfer.

MAT 052 Basic Algebra

4 Hours

Prerequisites: MAT 051 or equivalent with a grade of "C" or higher or assessment
4 hours weekly (4-0)

MAT 052 is designed for students with less than one year of high school algebra. The student must earn a "C" or higher in order to enroll in MAT 062. In addition, the student will need to successfully complete MAT 061 (or equivalent) and MAT 062 before progressing to transfer-level mathematics courses. This course covers the properties of real numbers; solving equations and inequalities in one variable; operations with polynomials in one variable as well as an introduction to polynomials in several variables; factoring polynomials leading to solving quadratic equations by factoring; operations with rational expressions and solving rational equations; graphing linear equations in two variables, slope, and writing equations of lines; solving systems of linear equations; and radical notation, including solving radical equations.

This is a developmental course which is used to calculate GPA at John A. Logan College, but does not transfer.

MAT 052H Supplemental Study-Basic Algebra

1 Hour

Prerequisites: Currently enrolled in MAT 052 or consent of instructor.
1 hour weekly (1-0)

Students currently enrolled in developmental math course MAT 052 are targeted for this course, although other students may benefit from this supplemental study course. The class time will revolve around intensified tutor sessions to meet individual student need.

This is a developmental course which is used to calculate GPA at John A. Logan College, but does not transfer.

MAT 061 Basic Euclidean Geometry

3 Hours

Prerequisites: MAT 052 with a grade of "C" or higher or assessment
3 hours weekly (3-0)

MAT 061 is designed for students who did not successfully complete at least one year of Euclidean geometry at the secondary level and therefore must fill this deficiency prior to completing the mathematics requirement for their degree from John A. Logan College. In order to help students think deductively, this course will emphasize logical reasoning, using geometric concepts and relationships as the vehicle to meet this goal. Topics include reasoning, basic logic theory, definitions, axioms, proofs, constructions, line and angle relationships, parallel lines, triangle congruency, and similarity theorems, quadrilaterals, circles, and area of polygons and circles. The ultimate purpose of this course is to help students learn to apply the principles of geometry, as well as enable them to develop logical and deductive thinking.

This is a developmental course which is used to calculate GPA at John A. Logan College, but does not transfer.

MAT 062 Intermediate Algebra

5 Hours

Prerequisites: MAT 052 and MAT 061 both with a grade of "C" or higher or assessment
5 hours weekly (5-0)

MAT 062 is designed for students with less than two years of high school algebra. Students must earn a grade of "C" or higher in order to progress to transfer-level mathematics courses. This course will cover linear equations and inequalities; graphs of equations—both linear and nonlinear equations; functions and graphs; slope and equation of lines; systems of equations; operations with and factoring of polynomials; operations with rational expressions and solving rational equations; operations with radical expressions and solving radical equations; rational exponents; complex numbers; quadratic equations and graphs; exponential and logarithmic functions. The Texas Instrument TI-83 or TI-84 graphing calculator or a graphing calculator approved by the instructor is recommended for this course.

This is a developmental course which is used to calculate GPA at John A. Logan College, but does not transfer.

MAT 062H Supplemental Study

1 Hour

Prerequisites: Concurrently enrolled in MAT 062
1 hour weekly (1-0)

Students currently enrolled in developmental math course MAT 062 are targeted for this course, although other students may benefit from this supplemental study course. The class time will revolve around intensified tutor sessions to meet individual student need.

This is a developmental course which is used to calculate GPA at John A. Logan College, but does not transfer.

MAT 099 Math Skills—Education

1 Hour

Prerequisites: None
1 hour weekly (1-0)

MAT 099 prepares students for the math component of the enhanced Basic Skills Test of the Illinois Certification Testing System (ICTS). Candidates seeking an education major for entry into the program are required to take and pass a basic skills test. The skills addressed in this course will prepare students to demonstrate quantitative literacy at the college level through the application of mathematical methods and reasoning to solutions of real-world problems.

This is a developmental course which is used to calculate GPA at John A. Logan College, but does not transfer.

MAT 104 Mathematics for Allied Health

3 Hours

Prerequisites: None
3 hours weekly (3-0)

This course is designed to prepare prospective Allied Health students in the areas of mathematics in which they must be proficient in order to accurately perform their duties as licensed Health Care professionals. Topics covered include the four basic arithmetic operations as applied to positive integers, fractions, mixed numbers, and decimals as well as metric measurements. Conversions among fractions, decimals, percents, ratios, and mixed numbers are also included. The majority of the course is devoted to real problems from pharmacology. The students are not allowed to use calculators in this course.

MAT 105 Vocational Mathematics

3 Hours

Prerequisites: None
3 hours weekly (3-0)

This is a basic mathematics course for the vocational-technical student. It is not designed for college transfer. This course is designed to review and improve mathematical skills necessary for everyday calculations in the two-year technical programs. Starting from very basic mathematics, the course progresses through a minimal introduction to geometry while stressing the metric system and measurements.

MAT 106 Technical Mathematics

4 Hours

Prerequisites: MAT 051 or assessment
4 hours weekly (4-0)

MAT 106 is designed for students in technical programs who have minimal mathematics backgrounds (pre-algebra arithmetic skills). The course is designed to give the student an understanding of introductory algebra covering topics such as polynomials, linear equations and their solutions, solving systems of linear equations, factoring, and quadratic equations. Also, the metric system, ratio and proportions, geometry, and trigonometry will be emphasized. A large number of applications will be integrated throughout the course.

MAT 107 Technical Math with Applications

IAI – MTM 901

4 Hours

Prerequisites: MAT 062 or assessment
4 hours weekly (4-0)

MAT 107 emphasizes applications of algebra and trigonometry in technical fields. Topics include functions and graphs, systems of linear equations, quadratic equations, higher degree equations and variation, trigonometric functions, laws of sines and cosines, complex numbers, and exponential and logarithmic functions.

MAT 108 College Algebra

3 Hours

Prerequisites: MAT 061 and MAT 062 both with a grade of "C" or higher or assessment
3 hours weekly (3-0)

MAT 108 is a general education mathematics course; however, it cannot be taken as the only mathematics course for the A. A. degree. College Algebra gives in-depth study of graphs of equations, functions, transformations, polynomial, rational and functions and partial fraction decomposition. Exponential and logarithmic functions, systems of equations and inequalities, matrices, and determinants are also covered. College Algebra requires a thorough understanding of Intermediate Algebra. The Texas Instruments TI-83 or TI-84 graphing calculator or a graphing calculator approved by the instructor is required.

MAT 109 College Trigonometry

IAI – MTM 901

3 Hours

Prerequisites: MAT 108 with a grade of "C" or higher or assessment
3 hours weekly (3-0)

MAT 109 in conjunction with MAT 108 will fulfill the prerequisites for MAT 131, Calculus I. This course covers trigonometric functions and inverse trigonometric functions; solutions of right triangles and oblique triangles; trigonometric identities; trigonometric equations; vectors; conic sections; sequences, series and the binomial theorem. The Texas Instruments TI-83 or TI-84 graphing calculator or a graphing calculator approved by the instructor is required for this course.

MAT 111 Pre-Calculus

5 Hours

Prerequisites: MAT 061 and MAT 062 both with a grade of "C" or higher or assessment
5 hours weekly (5-0)

Students who successfully complete MAT 111 may use it to fulfill part of the 6 hours general education requirement in mathematics for the A. S. degree at John A. Logan College. However, MAT 111 cannot be taken as the only mathematics course for the A. A. degree. Tentatively, topics included in this course are functions, graphs, and transformations; polynomial and rational functions; exponential and logarithmic functions; angles, triangles, and trigonometric functions and their inverses; trigonometric identities, functions, and equations; triangles, vectors, and applications; systems of equations; matrices and determinants; conic sections; sequences, series, mathematical induction, and the binomial theorem. The Texas Instruments TI-83 or TI-84 graphing calculator or a graphing calculator approved by the instructor is required for this course.

MAT 113 Introduction to Contemporary Mathematics

IAI – M1 904
3 Hours

Prerequisites: MAT 061 and MAT 062 both with a grade of “C” or higher or assessment
3 hours weekly (3-0)

MAT 113 is a general education mathematics course which fulfills 3 hours of the core curriculum’s mathematics requirement. Designed particularly for the non-science major, the course focuses on mathematical reasoning and solving of real-life problems, rather than on routine skills. Four of the following topics will be studied in depth: linear programming (including functions and graphs), sets and logic, game theory, counting techniques and probability, geometry (additional topics beyond the prerequisite), or statistics.

MAT 116 Finite Mathematics for Business and Management

IAI – M1 906
3 Hours

Prerequisites: MAT 108 with a grade of “C” or higher or assessment
3 hours weekly (3-0)

While MAT 116 may be used to fulfill part of the 6 hours general education mathematics requirement for the A. S. degree at John A. Logan College, it is designed primarily for economics, business administration and accounting majors. Those students will be required to take a calculus course to complete their mathematics sequence. MAT 116 will fulfill the mathematics requirement for the A. A. degree. Topics covered include functions and lines, linear systems, linear programming, the Simplex Method, mathematics of finance, set theory, and probability. MAT 116 is not designed for mathematics or science majors. The Texas Instruments TI-83 or TI-84 graphing calculator or a graphing calculator approved by the instructor is required for this course.

MAT 117 Calculus for Business and Social Sciences

IAI – M1 900-B
4 Hours

Prerequisites: MAT 108 with a grade of “C” or higher or assessment
4 hours weekly (4-0)

MAT 117 is designed especially for business administration and accounting majors. MAT 117 does not count toward a major or minor in science-

related areas. Students who successfully complete this course fulfill the general education mathematics requirement at John A. Logan College. MAT 117 may be taken before or after MAT 116; however, it is recommended that it be taken immediately after College Algebra (MAT 108). Topics covered include graph sketching and recognition, and differentiation and integration of polynomial, rational, exponential, and logarithmic functions. Applications from the worlds of business and social science are emphasized. The Texas Instruments TI-83 or TI-84 graphing calculator or a graphing calculator approved by the instructor is required for this course.

MAT 120 Elementary Statistics

IAI – M1 902
3 Hours

Prerequisites: MAT 061 and MAT 062 both with a grade of “C” or higher or assessment
3 hours weekly (3-0)

MAT 120 is a general education mathematics course which fulfills 3 hours of the core curriculum mathematics requirement. The course introduces the basic properties of descriptive and inferential statistics, basic probability theory, probability distributions, graphing, measures of location and variation, linear regression and correlation. Emphasis is placed on the application of statistics, distributions, and regression analysis. The Texas Instruments TI-83 or TI-84 graphing calculator is required for this course.

MAT 125 Discrete Structures (Also CPS 202)

IAI – M1 905, CS 915
3 Hours

Prerequisites: MAT 108 or MAT 111 either with a grade of “C” or higher or assessment
3 hours weekly (3-0)

MAT 125 is a general education mathematics course which fulfills 3 hours of the core curriculum mathematics requirement. It will lay the groundwork for students interested in computer arithmetic, sets, relations and functions, logic, Boolean algebra, elementary matrix operations, combinations, permutations, counting techniques, and basic concepts of probability. **MAT 125 is ordinarily offered in the fall semester in odd numbered years.**

MAT 131 Calculus I

IAI – M1 900-1, EGR 901, MTH 901
5 Hours

Prerequisites: MAT 109 or MAT 111 either with a grade of “C” or higher or assessment
5 hours weekly (5-0)

MAT 131 will cover the basic concepts and techniques of single variable calculus. Although careful definitions and statements will be given, emphasis on formal proof will be minimal. Topics will include limits and their properties, differentiation of single variable functions, integration of elementary functions, and several applications of differentiation and integration associated with analytic geometry and physics. Students who successfully complete this course fulfill the general education mathematics requirement of John A. Logan College. The Texas Instruments TI-83 or TI-84 graphing calculator or a graphing calculator approved by the instructor is required for this course.

MAT 201 Calculus II

IAI – M1 900-2, EGR 902, MTH 902
5 Hours

Prerequisites: MAT 131 with a grade of “C” or higher.
5 hours weekly (5-0)

MAT 201 is a continuation of MAT 131. Students who successfully complete this course fulfill the general education mathematics requirement of John A. Logan College. Topics include integration, methods of integration, applications of integration, infinite series, power series, polar coordinates, parametric equations, and introduction to three-dimensional and integral calculus. The Texas Instruments TI-83 or TI-84 graphing calculator or a graphing calculator approved by the instructor is required for this course.

MAT 202 Calculus III

IAI – M1 900-3, EGR 903, MTH 903
3 Hours

Prerequisites: MAT 201 with a grade of “C” or higher
3 hours weekly (3-0)

MAT 202 is an introduction to multivariable calculus. Topics include vectors in two and three dimensions; vector operations; planes and lines in space; cylinders, quadric surfaces, and surfaces of revolution; cylindrical and spherical coordinates; vector-valued functions (space curves); limits, continuity, differentiation, differentials, iterated integrals, double integrals, triple integrals and

applications of functions of two or three variables; optimization using Lagrange multipliers; directional derivatives, gradients, and the Jacobian. The Texas Instruments TI-83 or TI-84 graphing calculator or a graphing calculator approved by the instructor is required for this course.

MAT 202H Supplemental Study: Calculus III

1 Hour

Prerequisites: Concurrent enrollment in MAT 202
1 hour weekly (1-0)

MAT 202H is a supplemental study course designed to be taken concurrently with MAT 202. This course is designed for students who are having or have had difficulties with Calculus III. The focus will be on supplementing the existing MAT 202 class with in-class exercises, demonstrations, and small group activities. The student will receive a pass/fail grade based upon attendance and participation.

MAT 205 Differential Equations

IAI – EGR 904, MTH 912
3 Hours

Prerequisites: MAT 201 with a grade of “C” or higher
3 hours weekly (3-0)

MAT 205 is an introduction to differential equations. Topics include standard solution techniques for first order linear, separable, exact, and/or homogeneous equations; standard solution techniques for homogeneous second and higher order equations with constant coefficients; linear independence of solutions; the Wronskian; the methods of reduction of order, undetermined coefficients and variation of parameters; Cauchy-Euler equations; the existence and uniqueness of solutions; the Laplace transform, transfer and impulse response functions. Further topics may be chosen from system and plane analysis, Newtonian mechanics, RLC circuit analysis, power series methods, numerical methods, stability of solutions, the heat equation and Fourier Series, or Bessel functions. The Texas Instruments TI-83 or TI-84 graphing calculator or a calculator approved by the instructor is required for this course.
MAT 205 is offered in the spring semester only.

MAT 205H Supplemental Study: Differential Equations

1 Hour

Prerequisites: Concurrent enrollment in MAT 205
1 hour weekly (1-0)

MAT 205H is a supplemental study course designed to be taken concurrently with MAT 205. This course is designed to help students use the computer to aid in the study of differential equations. The focus will be on supplementing the existing MAT 205 class with in-class exercises, demonstrations, and small group activities. The student will receive a pass/fail grade based upon attendance and participation.

MAT 208 Mathematics for Elementary Teachers I

3 Hours

Prerequisites: MAT 061 and MAT 062 both with a grade of "C" or higher or assessment
3 hours weekly (3-0)

MAT 208 is the first of two courses in the mathematics sequence required for elementary and/or special education majors. It covers sequences, problem solving, set theory, logic, numeration systems and whole numbers, integers, introductory geometry, number theory, and rational numbers. In order to receive credit, the student must earn a grade of "C" or higher.

MAT 209 Mathematics for Elementary Teachers II

IAI – M1 903

3 Hours

Prerequisites: MAT 208 with a grade of "C" or higher
3 hours weekly (3-0)

MAT 209 is the second of two courses in the mathematics sequence required for elementary and/or special education majors. The completion of the two course sequence (MAT 208 and MAT 209) will meet the general education mathematics core requirement. It includes decimals, percent, real numbers, probability, statistics, geometric figures, congruencies, similarities, concepts of measurement (including the metric system), and coordinate geometry. In order to receive credit, the student must earn a grade of "C" or higher.

MAT 221 Introduction to Linear Algebra

IAI – MTH 911

3 Hours

Prerequisites: MAT 201 with a grade of "C" or higher
3 hours weekly (3-0)

MAT 221 is an introduction to the theory and application of linear algebra. Topics include systems of linear equations, matrices, determinants, vector spaces, inner product spaces, linear transformations, and the eigenvalue problem. Emphasis is placed on the application of linear algebra and formal verification of theoretical properties. Applications include polynomial curve fitting, network analysis, stochastic matrices, Leontief Input-Output models, least squares regression analysis, eigenvalue problems, applications in analytic geometry, and least squares approximations. The Texas Instruments TI-83 or TI-84 graphing calculator or a calculator approved by the instructor is required for this course. **MAT 221 is ordinarily offered in the spring semester in even numbered years.**

MAT 282 Statistics

IAI – M1 902

3 Hours

Prerequisites: MAT 108 with a grade of "C" or higher or assessment
3 hours weekly (3-0)

MAT 282 is designed to meet the needs of students requiring a statistics course with a college algebra prerequisite in their programs. Topics include descriptive statistics, including graphical and numerical, basic probability theory, probability distributions, inferences involving estimation, and hypothesis testing, correlation and regression, and analysis of variance. The Texas Instruments TI-83 or TI-84 graphing calculator or a calculator approved by the instructor is required for this course. **MAT 282 is ordinarily offered in the summer semester only.**