Mathematics

General Information

In a sophisticated, technological society, all students need problem-solving skills as consumers of goods and services, taxpayers, and money managers. The scope and sequence of the math curriculum each student takes is determined by ability, interest, career choice, and post-secondary educational plans. The state of Missouri requires that all students take **three** years of mathematics. Achievement in all math courses requires attending class regularly, completing homework, taking notes, asking questions, and studying daily. If a student needs placement in a different course in the math sequence, this may occur prior to the second semester, but the student will continue in the math program if it is a required course (Algebra I, Geometry, or Algebra II).

Computer Science Essentials (1016) may count as a math credit.

Courses at a Glance

Course Number	Course Title	Grade Level	Credits Earned	School	Prerequisites Needed
1104	Algebra Lab	All	1.0 Elective	MC, N, S	None
1101	Algebra I	All	1.0 Math	All	None
1110	Geometry	All	1.0 Math	MC, N, I	1101 Algebra I
1112	(H) Geometry	All	1.0 Math	All	B or higher in 1101 Algebra I
1120	Algebra II	All	1.0 Math	MC, N, I	1110 Geometry or 1112 (H) Geometry
1122	(H) Algebra II	All	1.0 Math	All	B or higher in 1110 Geometry or 1112 (H) Geometry
1130	Algebra III	11 12	1.0 Math	All	1110 Geometry or 1112 (H) Geometry AND 1120 Algebra II or 1122 (H) Algebra II
1131	College Algebra	10 11 12	1.0 Math	All	1110 Geometry or 1112 (H) Geometry AND 1120 Algebra II or 1122 (H) Algebra II
1175	Probability & Statistics	10 11 12	1.0 Math	MC, N, I	1110 Geometry or 1112 (H) Geometry AND 1120 Algebra II or 1122 (H) Algebra II
1170	(H) Pre-Calculus	11 12	1.0 Math	All	1110 Geometry or 1112 (H) Geometry AND 1120 Algebra II or 1122(H) Algebra II (B or higher)
1121	(H) AP Calculus AB	11 12	1.0 Math	All	B or higher in 1170 Pre-Calculus
1125	(H) AP Calculus BC	11 12	1.0 Math	All	B or higher in 1170 Pre-Calculus
1127	(H) Calculus 3	11 12	1.0 Math	All	1125 (H) AP Calculus BC
1126	(H) Linear Algebra	11 12	1.0 Math	All	1125 (H) AP Calculus BC
1128	(H) Differential Equations	12	1.0 Math	All	1127 (H) Calculus 3
1176	(H) AP Statistics	11 12	1.0 Math	All	1110 Geometry or 1112 (H) Geometry AND 1120 Algebra II or 1122 (H) Algebra II
1164	IB Math Analysis and Approaches (HL) year 1	11	1.0 Math	N, S	Algebra I 1101 Geometry I 1110 or Honors Geometry 1112 Algebra II 1120 or 1122 (H) Algebra II
1165	IB Math Analysis and Approaches (HL) year 2	12	1.0 Math	N, S	IB Math Analysis and Approaches (HL) year 1
1161	IB Math Applications and	11	1.0 Math	N	Algebra I 1101

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	Interpretations (SL) year 1				Geometry I 1110 or Honors Geometry 1112 Algebra II 1120 or 1122 (H) Algebra II
1162	IB Math Applications and Interpretations (SL) year 2	12	1.0 Math	N	IB Math Applications and Interpretations (SL) year 1
1016	Computer Science Essentials	All	1.0 CTE or 1.0 Math	MC, N, S, I	None

Course Descriptions

Course No: 1101 Algebra I
Grade Level: All
Length: Year
Credit: 1.0 Math
Prerequisite: None
Description: This is the foundation course for all other studies of mathematics. The students will work with algebraic expressions and word problems, solve linear equations and inequalities; make graphs on a number line and in the Cartesian plane; work with square roots, and solve quadratic equations using the quadratic formula. This is a state assessment (EOC Course). A scientific calculator is needed for this course.

Course No: 1104 Algebra I Lab
Grade Level: All
Length: Year
Credit: 1.0 Elective
Prerequisite: None
Description: The curriculum provides interventions for skill deficiencies, reinforces Algebra 1 concepts, and incorporates test-taking strategies to improve achievement on the End of Course Exam. Topics include: solution strategies involving linear and nonlinear equations on the coordinate system; exponents; signed numbers; facility with problems that refer to fractions, decimals and percents; data tables or graphs; and a wide range of word problems that involve rate, proportion, probability, and algebraic solutions.

Course No: 1110 Geometry
Grade Level: All
Length: Year
Credit: 1.0 Math
Prerequisite: 1101 Algebra I
Description: This course consists of the fundamental vocabulary, postulates, properties, and theorems of two-dimensional figures and some three dimensional figures. Individual topics covered are points, lines, planes, angles, triangles, quadrilaterals, inequalities, coordinate geometry, area, volume, construction, similarity and parallel lines. Part of this course is the use of problem solving skills and critical thinking to perform deductive two column proofs. A scientific calculator, a compass, protractor, and ruler is needed for this course.

Course No: 1112 (H) Geometry
Grade Level: All
Length: Year
Credit: 1.0 Math (Honors)
Prerequisite: B or higher in 1101 Algebra I
Description: Honors Geometry provides a more in-depth study of Geometry for the highly motivated student. This accelerated course includes all the content of Geometry, with an additional emphasis placed on the use of logic and writing of formal proofs. All topics are covered in more depth; the more

difficult applications are routinely assigned. A scientific calculator, a compass, protractor, and ruler is needed for this course.

Course No: 1120 Algebra II
Grade Level: All
Length: Year
Credit: 1.0 Math
Prerequisite: 1110 Geometry or 1112 (H) Geometry
Description: This course consists of more advanced topics than those in Algebra I. Topics include real number axioms, absolute value, equations and inequalities, linear equations and inequalities, relations and function, conic sections, rational exponents, radicals, system of equations and related application problems. This is a state assessment (EOC) course if a student has not taken the Algebra I EOC in high school. A TI-83/84 graphing calculator is needed for this course.

Course No: 1121 Advanced Placement (AP) Calculus AB
Grade Level: 11, 12
Length: Year
Credit: 1.0 Math (Honors)
Prerequisite: B or higher in 1170 Pre-Calculus
Description: This is a first course in differential and integral calculus. Topics include derivatives and their application to maximum/minimum and related rate problems, integrals and their application to areas under a curve and volumes of solids of revolution. The content follows the syllabus for the Advanced Placement Exam for Calculus AB. A passing grade on this exam provides students with college credit for Calculus at most schools. A TI-83/84 graphing calculator is needed for this course.

Course No: 1122 (H) Algebra II
Grade Level: All
Length: Year
Credit: 1.0 Math (Honors)
Prerequisite: B or higher in 1110 Geometry or 1112 (H) Geometry
Description: This course is a study in intermediate algebra, trigonometry, and elementary analytical geometry at an accelerated rate and more in-depth than Algebra II/Trigonometry. Topics covered include: extensive study of Polynomial equations, factoring rules, rational expressions and equations, quadratic, linear, logarithmic and trigonometric functions; applying number systems; conic sections and systems of equations.This is a state assessment (EOC) course if a student has not taken the Algebra I EOC in high school. A TI-83/84 graphing calculator is needed for this course.

Course No: 1125 Advanced Placement (AP) Calculus BC
Grade Level: 11, 12
Length: Year
Credit: 1.0 Math (Honors)
Prerequisite: B or higher in 1170 Pre-Calculus
Description: This course is designed to cover two semesters of college calculus material. This course includes an extensive study of functions, graphs, limits, derivatives, integrals, parametric equations, polar coordinates, polynomial approximations and series, and applications of all the above. The content follows the syllabus for the Advanced Placement Exam for Calculus BC and prepares students for the Advanced Placement exam. A passing grade on this exam provides students with college credit for Calculus at most schools. A Ti-83/84 is needed for this course.

Course No: 1126 Linear Algebra
Grade Level: 11 12
Length: Year
Credit: 1.0 Math

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Prerequisite: 1125 (H) AP Calculus BC
Description: An introduction to linear algebra. Topics will include complex numbers, geometric vectors in two and three dimensions and their linear transformations, the algebra of matrices, determinants, solutions of systems of equations, eigenvalues and eigenvectors. A Ti-83/84 is needed for this course.

Course No: 1127 Calculus 3
Grade Level: 11 12
Length: Year
Credit: 1.0 Math
Prerequisite: 1125 (H) AP Calculus BC
Description: Topics include vectors, cylindrical and spherical coordinates, vector-valued functions, arc length and curvature, functions of several variables, partial and directional derivatives, gradients, extrema, Lagrange multipliers, multiple integrals, change of variables, surface area, vector fields, Stokes' Theorem. A Ti-83/84 is needed for this course.

Course No: 1128 Differential Equations
Grade Level: 12
Length: Year
Credit: 1.0 Math
Prerequisite: 1127 (H) Calculus 3
Description: Topics will be chosen from: linear differential equations, equations with constant coefficients, laplace transforms, power series solutions, systems of ordinary differential equations. A Ti-83/84 is needed for this course.

Course No: 1130 Algebra III---Intermediate College Algebra (STLCC, MTH 140)
Grade Level: 11, 12
Length: Year
Credit: 1.0 Math
Prerequisite: 1110 Geometry or 1112 (H) Geometry AND 1120 Algebra II or 1122 (H) Algebra II
Description: This course will combine algebra, geometry, number theory, probability, rational numbers, irrational numbers, real numbers and conic sections and apply these skills to the real world. It will prepare students for college placement tests that are used to determine where students are placed in math courses. There will be an emphasis on doing algebra without a calculator, since most placement tests do not allow them. This course can be taken for college credit through STLCC.

Course No: 1131 College Algebra---(STLCC, MTH160)
Grade Level: 10, 11, 12
Length: Year
Credit: 1.0 Math
Prerequisite: 1110 Geometry or 1112 (H) Geometry AND 1120 Algebra II or 1122 (H) Algebra II
Description: College Algebra topics include nonlinear functions and relations, logarithms, systems of equations, zeros of polynomials, complex numbers, sequences, and mathematical inductions. It is designed for the college- bound student who wishes to continue studying mathematics beyond high school. This course can be taken for college credit through STLCC.
A Ti-83/84 graphing calculator is needed for this course.

Course No: 1170 (H) Pre-Calculus
Grade Level: 11 12
Length: Year
Credit: 1.0 Math (Honors)
Prerequisite: 1110 Geometry or 1112 (H) Geometry AND 1120 Algebra II or 1122 (H) Algebra II

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Description: Pre-Calculus is the study of the interrelationship between algebra and geometry. Topics covered include algebraic equations for figures intake, Cartesian and Polar planes, extended study of trigonometry, sequences and series, and limits. A TI-83/84 graphing calculator is needed for this course.

Course No: 1175 Probability & Statistics
Grade Level: 10 11 12
Length: Year
Credit: 1.0 Math
Prerequisite: 1110 Geometry or 1112 (H) Geometry AND 1120 Algebra II or 1122 (H) Algebra II
Description: This course is designed as a general-purpose introduction to the field of statistics and probability. The primary objective of this course is to enable students to be wiser users and more critical consumers of statistical material. Topics include organizing and displaying data, analyzing data using measures of central tendency, measures of variation, and measures of relative standing. Probability concepts will also be studied and students will solve problems involving permutations and combinations, probability distributions, the central limit theorem, confidence intervals, and hypothesis testing. A Ti-83/84 is needed for this course.

Course No: 1176 Advanced Placement (AP) Statistics
Grade Level: 11 12
Length: Year
Credit: 1.0 Math (Honors)
Prerequisite: 1110 Geometry or 1112 (H) Geometry AND 1120 Algebra II or 1122 (H) Algebra II
Description: This course is an excellent option for any secondary school student who has successfully completed a second-year course in Algebra and who possesses sufficient mathematical maturity and quantitative reasoning ability. Students may wish to take AP Statistics concurrently with Pre-Calculus or Calculus. This course exposes students to four broad conceptual themes: exploring data, observing patterns and departures from patterns; planning a study, deciding what to measure and how to measure it; anticipating patterns in advance, introducing probability and simulation; and statistical inference, confirming models for explanations of patterns. A TI- 83/84 graphing calculator is needed for this course.

Course No: 1016 Computer Science Essentials
Grade Level: All
Length: Year
Credit: 2.0 CTE or 1.0 Math
Prerequisite: None
Description: This course is an excellent entry point for new high school computer science learners. And, students who have prior computer science experiences will have the opportunity to expand upon those experiences in this course. All students who take this course will have many opportunities for creative expression and exploration in topics of personal interest, whether it be through app development, web design, or connecting computing with the real world. If a student wishes to take this course for high school math credit, the student and parent/guardian will be asked to sign a form acknowledging that the credit may not satisfy college/university admission standards.

Course No: IB Math Analysis and Approaches (HL)
Grade Level: 11 12
Length: 2 Years
Credit: 2.0 MA/IB course certificate, or towards the completion of the IB Diploma/Career Program
Prerequisite: Algebra I 1101,Geometry I 1110 or Honors Geometry 1112, Algebra II 1120 1122 (H) Algebra II
Description: In this course, students will study mathematics using an inquiry based approach. Topics students will study include functions, trigonometry, calculus, sequences and series, univariate data, bivariate data, probability, and probability distributions. Emphasis will be placed on having a thorough conceptual understanding of mathematical topics required in the modern world. (IBO: Math Analysis and Approaches Subject Brief, 2019)

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Course No:	**Math Applications and Interpretations (SL)**
Grade Level:	11-12
Length:	2 Years
Credit:	2.0 MA/IB course certificate, or towards the completion of the IB Diploma Program
Prerequisite:	Algebra I 1101,Geometry I 1110 or Honors Geometry 1112, Algebra II 1120 1122 (H) Algebra II
Description:	The Mathematics applications and interpretation course recognizes the increasing role that mathematics and technology play in a diverse range of fields in a data-rich world. As such, it emphasizes the meaning of mathematics in context by focusing on topics that are often used as applications or in mathematical modelling. To give this understanding a firm base, this course includes topics that are traditionally part of a pre-university mathematics course such as calculus and statistics. Students are encouraged to solve real-world problems, construct and communicate this mathematically and interpret the conclusions or generalizations. Students should expect to develop strong technology skills, and will be intellectually equipped to appreciate the links between the theoretical and the practical concepts in mathematics. (IBO: Math Applications and Interpretations Subject Brief, 2019)