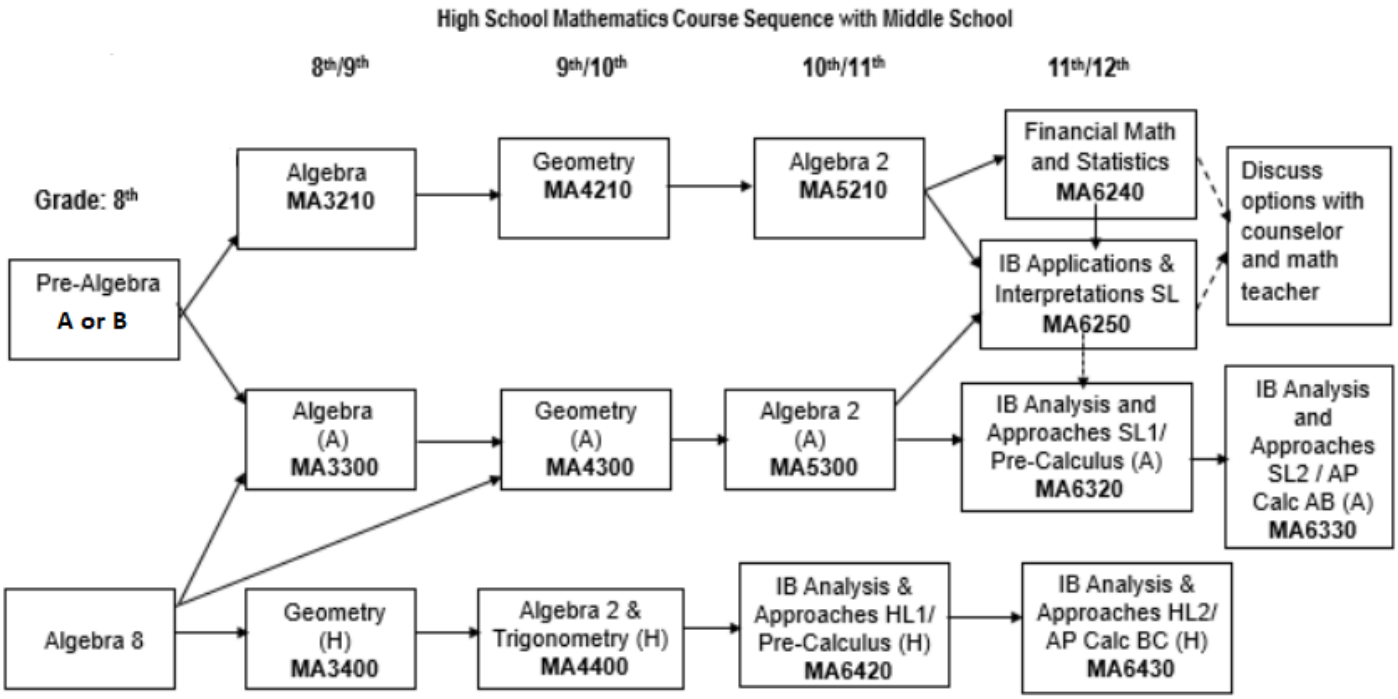
MATHEMATICS

To meet the Michigan high school graduation requirements, students must complete 4 credits of mathematics.

Course Sequencing - Mathematics



Typical course sequences are shown. Students should discuss options with their math teachers and counselor if they feel that the content of the class in which they are enrolled is not at the appropriate level.

MATHEMATICS COURSES

Mathematic courses required for graduation: Algebra I; Geometry; Algebra 2; including one class in senior year.

COURSE TITLE	PREREQUISITE	GRADE LEVEL	SEMESTER OR FULL YEAR	CONTENT
Algebra MA3210/V	Successful completion of Math 8 or Pre-Algebra 8	9-12	Full Year	This is a standard algebra course in which the fundamental laws and operations on real numbers are addressed. Other algebraic topics include recognition and evaluation of algebraic expressions, operations with polynomials, equations and inequalities, special products and factoring, algebraic fractions and fractional equations, functions-relations and graphs, linear equations and inequalities, systems of linear equations, roots and radicals, and quadratic equations.
Algebra 1 Seminar MA3230		9	Full Year	This is a course taken in addition to the student's regular mathematics class to support students needing additional support with mathematical concepts and skills as they enter standard level Algebra 1 (by teacher/parent recommendation and assessment). Seminar courses are not for math credit, only for general/elective credit.
Algebra A MA3300 *Accelerated*	Successful completion of Pre-Algebra 8	9-12	Full Year	This course encompasses all the topics of the standard course listed above but each topic is dealt with in more depth and breadth, as well as an introduction to algebraic proof. This course is taught at a faster pace and with a higher degree of rigor than the standard course. It is intended for students seeking a science and mathematics emphasis to support their future plans.

COURSE TITLE	PREREQUISITE	GRADE LEVEL	SEMESTER OR FULL YEAR	CONTENT
Geometry H MA3400 *Honors*	Successful completion of Algebra .3 A or Algebra 8	9-12	Full Year	The honors geometry course contains all the content of the accelerated course with the addition of vectors and solid geometry topics. Students study each topic in more depth and with more rigor than the other courses. This course is designed for students who have exhibited outstanding performance in mathematics and who wish to pursue the subject in great depth.
Geometry MA4210	Successful completion of Algebra	10-12	Full Year	Logic, set theory and number theory are used to analyze and discuss reasoning and formal proof. Proof is studied using a variety of formats. Topics include relationships of lines, planes, and angles; ratio and proportion; congruence and similarity; constructions; the study of polygons and circles, spheres, cones, cylinders, and polyhedra; coordinate geometry; and transformations. While the topics of a standard course are addressed, there is an emphasis on the relationship of algebra and geometry, on the understanding of the content, and upon more student examination of the topics via hands-on activities, group discussions, and applications of geometry.
Geometry Seminar MA4220		10, 11	Full Year	This is a course taken in addition to the student's regular mathematics class to support students needing additional support with mathematical concepts and skills as they enter standard level Geometry (by teacher/parent recommendation and assessment). Seminar courses are not for math credit, only for general/elective credit.
Geometry A MA4300 *Accelerated*	Successful completion of Algebra .3 A, or Algebra 8	9-12	Full Year	This course contains all the content of the standard course with added breadth and depth of problems considered, with special emphasis on approaches to proof. As with all accelerated courses, this one proceeds at a greater pace as well. This is intended for students seeking greater science and mathematics emphasis related to their future plans.
Algebra 2 - Trigonometry H MA4400 *Honors*	Successful completion of Algebra and Geometry .4 H	9, 10	Full Year	This course is designed for students who have exhibited outstanding performance in mathematics and who wish to pursue the subject in great depth. The course includes all topics of the IB Math Studies 1/ Algebra 2 A course, the essential concepts of trigonometry, and additional topics provided by the instructor. Students study each topic in more depth and with more rigor than the other Algebra 2 courses. A graphing calculator is essential in this course.
Algebra 2 MA5210	Successful completion of Algebra and Geometry	11, 12	Full Year	Topics in this course include the study of real numbers, equations and inequalities, polynomials, linear equations in two and three variables including systems of equations, the study of rational numbers, irrational numbers and complex numbers, quadratic equations, matrices, and logarithms. Optional topics include permutations, combinations, and probability. Students use graphing calculators in their study of algebra.
Algebra 2 Seminar MA5220		10-12	Full Year	This is a course taken in addition to the student's regular mathematics class to support students needing additional support with mathematical concepts and skills as they enter standard level Algebra 2 (by teacher/parent recommendation and assessment). Seminar courses are not for math credit, only for general/elective credit.
Algebra 2 MA5300 *Accelerated*	Successful completion of Algebra and Geometry .3 A or .4 H	10-12	Full Year	Algebra 2 A encompasses all the topics of the standard course but each topic is dealt with in more depth and breadth, at a faster pace, and with a higher degree of rigor intended for students seeking a science and mathematics emphasis to support their future plans. Included are a study of systems of equations in two and three variables; quadratic equations; quadratic relations and systems with graphing of parabolas, ellipses, hyperbolas; exponential and logarithmic functions; progressions; binomial functions with graphing; matrices and determinants; permutations, combinations, and probability; and additional topics provided by the instructor. A graphing calculator is essential in this course.
Financial Math & Statistics MA6240	Successful completion of Algebra, Geometry, and Algebra 2	11, 12	Full Year	Students will apply basic math principles in calculating income, benefits and payroll, banking applications, consumer purchasing, and making business management decisions. Probability and statistics topics include the fundamentals of permutations and combinations; methods of gathering, organizing, analyzing, and presenting data; interpretation of common statistical information such as mean, median, mode, standard deviation, and variance; and random numbers and sampling. Graphing calculators and computers are used extensively in the course.
IB Applications and Interpretations SL MA6250	Successful completion of Algebra 2 .2 or .3 Advanced Algebra A	11, 12	Full Year	This course is appropriate for students who are interested in developing their mathematics for describing our world and solving practical problems. Graphing calculators and explorations of mathematical model will be integrated throughout the class. Students who take Mathematics: Applications and Interpretation will be those who enjoy mathematics best when seen in a practical context. This subject is aimed at students who will go on to study subjects such as social sciences, natural sciences, statistics, business, some economics, psychology, and design, for example. Topics covered include numbers and algebra (sequences and series, logarithmic and exponential equations, and simple proof), functions (models with

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				linear, exponential, natural logarithm, cubic, and simple trigonometric functions), geometry and trigonometry (right-angled and non-right-angled trigonometry including bearings, surface area and volume of composite 3D solids), probability and statistics (collecting data and using sampling techniques, measures of central tendency and spread, correlation, regression, calculating probabilities, the normal distribution, Chi-squared test for independence and goodness of fit), and a brief introduction to calculus.
IB Analysis and Approaches SL 1/Pre-Calc A MA6320 *Accelerated*	Successful completion of Algebra 2 A .3	11, 12	Full Year	After this course, students should be able to enroll in a first-year college calculus course. Topics covered include numbers and algebra (examples: sequences and series, logarithmic and exponential equations, and simple proof), functions (examples: properties of functions and their inverses, solving equations both analytically and graphically, and transformation of graphs), geometry and trigonometry (examples: right-angled and non-right-angled trigonometry, radian measure, circular functions, trigonometric identities, vectors, complex numbers, polar and parametric graphing), probability and statistics (collecting data and using sampling techniques, measures of central tendency and spread, correlation, regression, and normal and binomial distributions), and an introduction to calculus (informal ideas of limits and convergence). This course is the first year of a two-year IB Math SL course. The student may take this course as part of an IB diploma or certificate program if desired or as a stand-alone course.
IB Analysis and Approaches SL2 / AP Calc AB A MA6330 *Accelerated*	Successful completion IB Analysis and Approaches SL 1/Pre-Calc A or IB Math HL 1 / Pre-Calculus H	11, 12	Full Year	IB Analysis & Approaches SL 2 / AP Calculus AB is a college-level course that includes the topics and applications of calculus traditionally taught in Calculus I and students who successfully complete the course should be able to take the AP Calculus AB Exam and/or the IB Analysis & Approaches SL exam if so desired. The objectives for this course include, but are not limited to, the objectives for the AP Calculus AB course and selected Analysis & Approaches SL topics not covered in Analysis & Approaches SL 1. This course requires extensive work by the student. A graphing calculator is essential in this course. This course is the second year of a two-year International Baccalaureate Math SL course. It may be taken as part of an IB diploma or certificate program if selected in year 1 of the two-course sequence or as a stand-alone AP Calculus AB course.
IB Analysis and Approaches HL 1/Pre-Calc H MA6420 *Honors*	Successful completion of Geometry H and Algebra 2 - Trigonometry H	11, 12	Full Year	This is a rigorous course for outstanding students preparing to take calculus. The course includes all topics of the IB Mathematics Analysis and Approaches SL1/Pre-Calculus A course. It includes: functions and their graphical representations; circular functions; polynomial functions; inverse functions; exponential and logarithmic functions; trigonometry; complex numbers; polar coordinates; vectors (both 2D and 3D); applications of algebra; applications of the circular functions to angles; matrices; permutations, combinations, and the binomial theorem; mathematical induction; discrete math topics and an introduction to calculus. A graphing calculator is essential in this course. This course is the first year of a two-year International Baccalaureate Math HL course. The student may take this course as part of an IB diploma or certificate program if desired or as a stand-alone Pre-Calculus (H) course.
IB Analysis & Approaches HL2/ AP Calc BC H MA6430 *Honors*	Successful completion IB Analysis and Approaches HL 1/Pre-Calc H	11, 12	Full Year	IB Analysis & Approaches HL 2 / AP Calculus BC is a college-level course that includes the topics and applications of calculus traditionally taught in Calculus I and II and students who successfully complete the course should be able to take the AP Calculus BC Exam and/or the IB Analysis & Approaches HL exam if so desired. The objectives for this course include, but are not limited to, the objectives for the AP Calculus BC course and selected Analysis & Approaches HL topics not covered in Analysis & AHL 1. This course requires extensive work by the student. A graphing calculator is essential in this course. This course is the second year of a two-year International Baccalaureate Math HL course. It may be taken as part of an IB diploma or certificate program if selected in year 1 of the two-course sequence or as a stand-alone AP Calculus BC course.
Computer Science Essentials MA3220	None	9-12	Full Year	This course provides students with a broad overview of computer science skills. Students will use a variety of programming styles to create apps using MIT App Inventor. Students will program Self-Driving Vehicle robots to follow defined paths and to study various computer science topics. Students will finish the course learning to code in Python. This course uses the Project Lead the Way curriculum and students often work with partners or in collaborative groups. No programming experience is necessary. Successful completion of this course will prepare students for the Computer Science 1 course. This is an elective course and is not intended to replace the regular mathematics sequence.
Computer Science 1 A MA4310	Successful completion or currently	9-12	Semester	This course provides students with a strong introduction to software development. No prior programming experience is necessary. In this course students learn to develop programs in a logical manner using structured programming methods. A problem-solving approach is emphasized including a final team project of creating a computer game. Topics include decision-making, loops, arrays, graphics, strings,

COURSE TITLE	PREREQUISITE	GRADE LEVEL	SEMESTER OR FULL YEAR	CONTENT
Accelerated	enrolled in Geometry A or H OR Successful completion of Computer Science Essentials			designing user interfaces, subprograms, debugging programs, and other special topics. Currently the Visual BASIC.net language is taught. This course is the recommended starting point in the computer science sequence for students enrolled in accelerated or honors math. This is an elective course and is not intended to replace the regular mathematics sequence.
Computer Science 2 A MA4320 Accelerated	Successful completion of Computer Science 1	9-12	Semester	Further develops programming topics covered in Computer Science 1. Currently the C++ language is taught. Topics new in this course include the fundamentals of object-oriented programming, data structures, searching and sorting functions, classes, major hardware components, system software, and other special topics. The final project in this course will involve programming and robotics. This is an elective course and is not intended to replace the regular mathematic sequence.
AP Computer Science A H MA5420 *Honors*	Successful completion of Computer Science 2	10-12	Full Year	Includes advanced topics in object-oriented programming, data structures, and algorithms. It is taught in the AP specific language, which is currently Java. Students learn the syntax of the language including the various library classes. The case study for the AP examination will be examined in depth. Students who successfully complete the course should be able to take the AP Computer Science A Advanced Placement Exam. This is an elective course and is not intended to replace the regular mathematics sequence.