

2012-2013 WRHS Mathematics Program Math Prerequisites

Course	Level	Prerequisites		
		Course, Grade	MCAS	Teacher Recommendation
Algebra 1	CPA	Pre-Algebra, C or higher	226 or higher	
	CP	Pre-Algebra, C- or below		
Math Connections I	CP	Pre-Algebra, D- or below		
Course	Level	Prerequisites		
		Course, Grade	MCAS	
Geometry	Honors	Algebra I, A-	250 or higher	Yes
	CPA	Algebra I, B- for incoming 9th graders CPA Algebra I for 10 th graders	240 or higher	Yes
	CP	CP Algebra I		Yes
Math Connections 2	CP	Math Connections I		Yes
Course	Level	Prerequisites		
		Course, Grade		
Algebra 2	Honors	H Geometry, B- & Algebra I, A		Yes
	CPA	Successful completion CPA Geo & CPA Algebra		Yes
	CP	Successful completion CP Geo & CP Algebra		Yes
Fundamentals of Algebra 2-Part 1	CP	Math Connections 2		Yes
Fundamentals of Algebra 2-Part 2	CP	Fundamentals of Algebra 2-Part 1		Yes
Course	Level	Prerequisites		
		Course, Grade		
Pre-Calculus	Honors	H Algebra 2, B-		Yes
	CPA	CPA Algebra 2		Yes
Advanced Algebra with Trigonometry	CP	CP Algebra 2		Yes
Course	Level	Prerequisites		
		Course, Grade		
Applied Calculus and Finite Mathematics	Honors	H Pre-Calculus; CPA Pre-Calculus, A- or higher		Yes
	CPA	CPA Pre-Calculus		Yes
Probability and Statistics	CP	H Pre-Calculus; CPA Pre-Calculus, C-		Yes
Course	Level	Prerequisites		
		Course, Grade		
Math Modeling Independent Study	Honors	AP Calculus, B- or H Topics in Math, B+		Yes
Course	Level	Prerequisites		
		Course, Grade		
AP Calculus	AP	Successful completion of Pre-Calculus		Recommended
AP Statistics	AP	Successful completion Pre-Calculus or H Algebra 2 students with a B- or higher may take AP Statistics concurrently with Pre-Calculus.		Recommended
Course	Level	Prerequisites		
		Course, Grade		
Introduction to Computer Programming	CPA	CPA Algebra 1, C		Yes
AP/H Java	AP or Honors	Successful completion of Intro to Computer Prog. Enrolled in H or CPA Algebra 2		Yes
Advanced Programming Independent Study	Honors or CPA	AP Java or teacher recommendation		Yes

*Unless otherwise noted, upward level changes will go through the mathematics department head and guidance.

In today's technological world, mathematical literacy is as essential as verbal literacy.

The goal of the WRHS Mathematics Program is to continue to provide learning opportunities, support, and encouragement for all students in a mathematics program that includes a strong emphasis on fundamental understanding of the basic concepts and skills of algebra and geometry, and to improve their understanding of statistics and probability in preparation for their individual future mathematics courses of study, and for standardized testing. Additionally it will continue to provide a variety of advanced mathematics courses that will extend, advance, and broaden the mathematics understanding and knowledge base of all students during their four-year high school experience. This is done through aligning our programs with the standards established by the NTCM and Massachusetts State Frameworks.

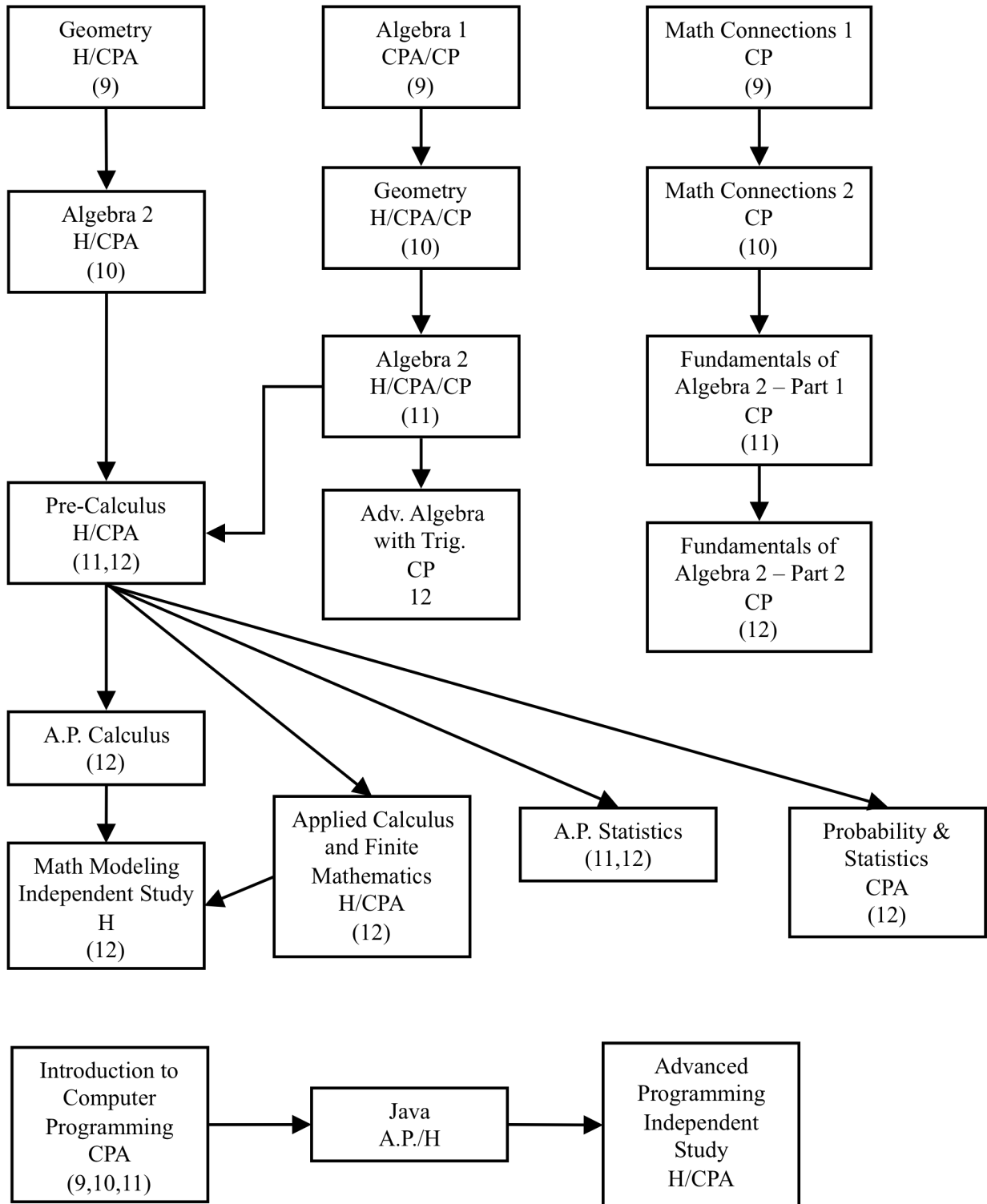
Wachusett's graduation requirement in Mathematics is 15 credits for all classes. However, it is recommended that all students complete a full mathematics sequence designed to meet their needs and post-secondary goals.

The use of calculators is an integral part of the mathematics courses offered at Wachusett. Although the type of required calculator depends on the individual course, it is recommended that all students have access to a scientific calculator for their use on homework, projects, etc. The advent of the graphing calculator has brought about many changes in the curriculum, reflected in textbooks, courseware, and the classroom. Some courses offered in the Mathematics Program will require the use of a calculator with the ability to graph and are specifically identified in the course description.

Mathematics is a course that requires the student to continually apply and increase the level of learning, day to day. It is therefore expected that each student will be prepared for class and will participate in his or her class. This requires that all homework and additional studying be completed in preparation for each day's class.

When a course is offered at multiple levels, students should take the level recommended by their present math teacher.

MATHEMATICS SEQUENCE 2011-2012



Lower School Options

Algebra 1 (CPA, CP; Grade 9)

5 credits

This course is the foundation for all future math courses at the high school and college level. This course reinforces and continues to develop fundamental math skills that are needed at all level of mathematics. This course explores the many uses of Algebra in the real world. Some of the concepts studied are solving linear equations and inequalities, solving systems of equations, and solving quadratic equations.

Math Connections 1 (CP, Grade 9)

5 credits

Math Connections 1 is the first year of a four-year math program designed to provide an introduction to the basic concepts of both algebra and geometry. This course will prepare students for entrance into Math Connections 2. Note to students who plan to play sports in college: The NCAA may not accept this class as a core course requirement.

Geometry (H, CPA, CP; Grades 9, 10)

5 credits

The goals of this course are to have students investigate and master the concepts and relationships of geometry before they are introduced to formal proofs. The subjects are brought to life with investigations, constructions, activities, and projects. Students apply inductive reasoning as they perform investigations, look for patterns, and make conjectures. They follow algebraic, paragraph, and flow-chart proofs building their reasoning and logic skills prior to getting to formal proofs where they can better understand the relevance of the proof. Students in Geometry CP will develop all the standard geometry skills but the course will have less emphasis on formal deductive proof.

Math Connections 2 (CP, Grade 10)

5 credits

Math Connections 2 is the second year of a four-year math program that is designed to provide an introduction to the basic concepts of both algebra and geometry. In addition, it will provide background information in support of preparation for the MCAS test at the end of the sophomore year. This course will prepare students for entrance into Fundamentals of Algebra 2 - Part 1. Note to students who plan to play sports in college: The NCAA may not accept this class as a core course requirement.

Math (Grades 9-12)

5 credits

This course provides extensive review of the basic fundamentals of arithmetic. Instruction is individualized and, depending upon each student's skills, may include all or some of the following: basic operations, fractions, decimals, percentages, measurement and consumer math. Students also learn critical thinking skills to solve problems similar to those faced in everyday living situations and on the MCAS.

Basic Math Connections I (Grades 9-10)

5 credits

This course is the first year of a two-year math program that is designed to provide an introduction to the basic concepts of both algebra and geometry utilizing an integrated approach. This course will prepare students for entrance into Basic Math Connections II. Topics covered will include: problem solving, variables, exponents, solving equations, finding area, rounding decimals, estimating, working with decimals, metric system, scientific notation, mean, median, mode, factoring, ratios, fractions, decimals, percents, adding, subtracting, multiplying and dividing integers, number patterns, and graphing. This course will offer exposure to the above topics with multiple opportunities for drill and practice. Concepts will be covered at a slow pace with multiple opportunities for drill and practice in preparation for the MCAS test.

Lower School / Upper School Options

Algebra 2 (H, CPA, CP; Grades 10, 11)

5 credits

This class prepares students to take Pre-Calculus and Statistics. A major goal of this course is for students to develop skills in manipulating and solving linear, quadratic, exponential, polynomial, radical, rational, and logarithmic equations. Topics include linear functions, systems, matrices, polynomial functions, rational expressions, powers, roots, radicals, quadratics, exponential and logarithmic functions, and inverse functions. It is recommended that students taking Algebra 2 at the Honors level have a graphing calculator (TI-83, TI-84, or TI-84 Plus).

Basic Math Connections II (Grades 10-12)

5 credits

This is the second course in the sequence of the two-year math program that is designed to provide an introduction to the basic concepts of both algebra and geometry utilizing an integrated approach. This course will extend student knowledge in algebra, geometry, and introduce statistics and probability and prepare students for a transition to regular education courses, Math Connections I and II. Concepts will be covered at a slow pace with multiple opportunities for drill and practice in preparation for the MCAS test. This course is not available to students who have already passed the MCAS math exam.

Math (CP, Grades 9-12)

5 credits

This course is formatted for the Learning Disabled student with application of appropriate modifications and learning strategies that address the specific learning styles of each individual student. Classes are conducted in a small, structured setting where the curriculum parallels that of the mainstream classroom. Emphasis is on verbal/oral presentation of lessons and materials paired with individualized instruction. Topics presented include basic computation of negative/positive integers, algebraic equations, graphing, word problems, logic, and basic geometry.

Upper School Options

Fundamentals of Algebra 2 - Part 1 (CP, Grade 11)

5 credits

This course is the third year of a four-year math program designed to provide a continuation of basic mathematics concepts and algebraic skills. Topics include properties of exponents, solving multi-step equations and inequalities, linear and quadratic functions and their graphs, factoring, solving and graphing systems of equations and inequalities, operations with matrices, determinants and Cramer's Rule, and operations with polynomials.

Fundamentals of Algebra 2 - Part 2 (CP, Grade 12)

5 credits

This course is the fourth year of a four-year math program and a continuation of Fundamentals of Algebra 2 - Part 1. Topics include radicals and complex numbers, solving systems with the use of technology, linear programming, exponential functions, logarithmic functions, polynomial functions, and right triangle trigonometry.

Pre-Calculus (H, CPA; Grades 11, 12)

5 credits

This course is very rigorous and prepares students to take Calculus in the future. It expands upon some concepts studied in Algebra 2 such as polynomial functions, matrices, and complex numbers. It includes an in depth study of many other types of functions including linear, composite, inverse, exponential, rational, and trigonometric. It also introduces advanced mathematical concepts such as conics, polar coordinates and sequences and series. Some mathematical modeling is done to relate these pre-calculus concepts to the real world. A graphing calculator is required for this course (TI-83, TI-84, or TI-84 Plus).

Advanced Algebra with Trigonometry (CP, Grade 12)

5 credits

This course expands upon algebraic concepts introduced in Algebra 2 (CP). Topics studied during the first semester include algebraic fractions, quadratic functions, exponential and logarithmic functions, conic sections, and sequences and series. Trigonometry will be the focus of the second semester. A graphing calculator is recommended for this course (TI-83, TI-84, or TI-84 Plus).

Applied Calculus and Finite Mathematics (H/CPA, Grade 12)

5 credits

This course will meet as a combined H/CPA class. This course is designed to expose college-bound students to mathematical topics universal to all majors. It includes such advanced topics as calculus, the theory of games, systems of linear equations, linear programming, the simplex method, and general problem solving techniques. A graphing calculator is required for this course (TI-83, TI-84, or TI-84 Plus).

Probability and Statistics (CPA, Grade 12)

5 credits

This course will use an activity-based approach to probability and statistics. The course will cover such topics as collecting and displaying data, measures of central tendency and variation, basic probability, confidence intervals, hypothesis testing, and chi-square analysis. A graphing calculator is required for this course (TI-83, TI-84, or TI-84 Plus).

Mathematical Modeling in Industry, Science, and Government (Ind. Study) (H, Grade 12)

5 credits

This course applies mathematical theory, learned from Algebra to Calculus, to problems that arise in the real world and require the utilization of mathematics to solve. Typical projects include an analysis of a company's yearly manufacturing capacity, the stress and potential for breaks due to a manufacturing process, and using available data to determine when an electronic sensor is working or sending back false readings. Students will be required to prepare formal papers and presentations that analyze the information available and make recommendations. Topics included are statistics, calculus, game theory, and probability, many times using a combination of these and other various mathematical skills. Some standard computer software packages such as Excel, Word, and PowerPoint will be utilized in the course.

Advanced Placement Statistics (AP, Grades 11, 12)

5 credits

This course introduces students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Students who successfully complete the course and AP Examination may receive credit and/or advanced placement for up to two semesters of college coursework in Statistics. A graphing calculator is required for this course (TI-83, TI-84, or TI-84 Plus). Algebra 2 Honors students with a B- or higher may take AP Statistics and Pre-Calculus concurrently.

Advanced Placement Calculus (AP, Grade 12)

5 Credits

This is a college-level mathematics course that follows the guidelines from the AP College Board to prepare students for the AP Exam and the second year of calculus at the college level. Students will study the four major topics of calculus: limits, derivatives, definite integrals, and differential equations. The course emphasizes multiple approaches to calculus, with concepts, results and problems being expressed graphically, numerically, and analytically. A graphing calculator is required for the AP Exam, and it is required that all students enrolling in this course have one of their own to use in class and at home.

Introduction to Computer Programming (CP, Grades 9, 10, 11)

5 credits

The course is divided between classroom and computer lab time where the student completes his or her assigned work using Dell PC computers. Students are taught programming techniques and fundamental problem-solving strategies. During semester 1, the student will learn simple to advanced coding techniques using the True BASIC language. Semester 2 is devoted to coding using the C++ language. This course mirrors an entry-level college course and will form the basis for the AP/Honors Java programming course. The student should have a solid background in Algebra and keyboarding techniques.

Advanced Placement JAVA Programming (AP/H, Grades 10, 11, 12)

5 credits

JAVA is a high-level programming language and this should not be taken as an entry level-programming course. This course is taught using a combination of lecture with the instructor, defining relevant terms and providing detailed solutions to sample examples, and a significant amount of hands-on lab activities. Students who successfully complete this course and do well on the AP examination may receive credit and/or advanced placement for up to two semesters of college coursework in computer science. Enrollment is limited.

Advanced Programming, (Ind Study) (H, CPA; Grades 11, 12)

5 credits

This course uses Microsoft Visual Studio BASIC in addition to C#. The course is divided between classroom and computer lab time. More emphasis will be placed on individual learning and experimentation with programming techniques than in other programming courses. Students are expected to have learned basic and intermediate programming methods in previous courses. In this course the student will learn a higher level of coding using forms and design. It will allow the student to become more creative in his or her approach to the design, development, and coding of his or her projects. This course is comparable to a first-year college comp