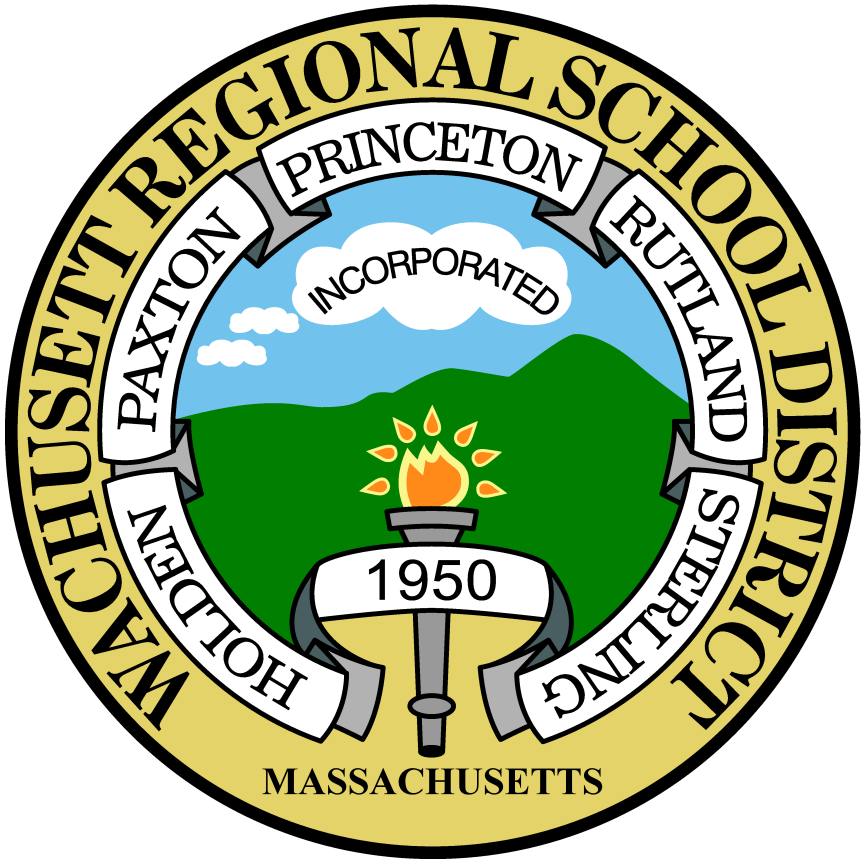
Wachusett Regional High School



2019-2020 Educational Guide

Mathematics Program of Studies

Course	Level	Prerequisites		
		Prerequisite Course, Grade	**MCAS**	**Teacher Recommendation**
Algebra 1	Honors	B+ or better in Math 8	≥ 494	Yes & department head
	CPA	C or better in Math 8	≥ 484	Yes & department head
	CP	C- or below in Math 8		Yes & department head
Fundamentals of Algebra 1	CP	D- or below in Math 8		Yes & department head
Course	**Level**	**Prerequisites**		
		Prerequisite Course, Grade	**MCAS**	
Geometry	Honors	A- in Algebra 1	≥ 507	Yes
	CPA	B- in Algebra 1 for incoming 9th graders CPA Algebra 1 for 10th graders	≥ 500	Yes
	CP	CP Algebra 1		Yes
Fundamentals of Geometry	CP	Fundamentals of Algebra 1		Yes
Course	**Level**	**Prerequisites**		
		Prerequisite Course, Grade		
Algebra 2	Honors	B- in H Geometry and A in Algebra 1		Yes
	CPA	Successful completion CPA Geo & CPA Algebra		Yes
	CP	Successful completion CP Geo & CP Algebra		Yes
Fundamentals of Algebra 2	CP	Fundamentals of Geometry		Yes
Course	**Level**	**Prerequisites**		
		Prerequisite Course, Grade		
Pre-Calculus	Honors	B- in H Algebra 2		Yes
	CPA	C- in CPA Algebra 2		Yes
	CP	CP Algebra 2		Yes
Advanced Mathematical Concepts	CP	Fundamentals of Algebra 2		Yes
Course	**Level**	**Prerequisites**		
		Course, Grade		
Applied Calculus and Finite Mathematics	Honors	C or better in H Pre-Calculus A- or better in CPA Pre-Calculus		Yes
	CPA	Successful completion of H Pre-Calculus C or better in CPA Pre-Calculus, C		Yes
Probability and Statistics	CPA	Successful completion of Pre-Calculus		Yes
Course	**Level**	**Prerequisites**		
		Prerequisite Course, Grade		
AP Calculus AB	AP	Successful completion of Pre-Calculus		Yes
AP Calculus BC	AP	83 or higher in both Algebra 2 H and Pre-Calculus		Yes
AP Statistics	AP	Successful completion of Pre-Calculus		Yes

Mathematics at WRHS

In today's technology-driven 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 Common Core State Standards.

Wachusett's graduation requirement in Mathematics is 15 credits. It is recommended, however, that all students complete four years of Mathematics to ensure college and career readiness. Massachusetts state universities will require four years of math for freshmen classes starting in 2016.

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.

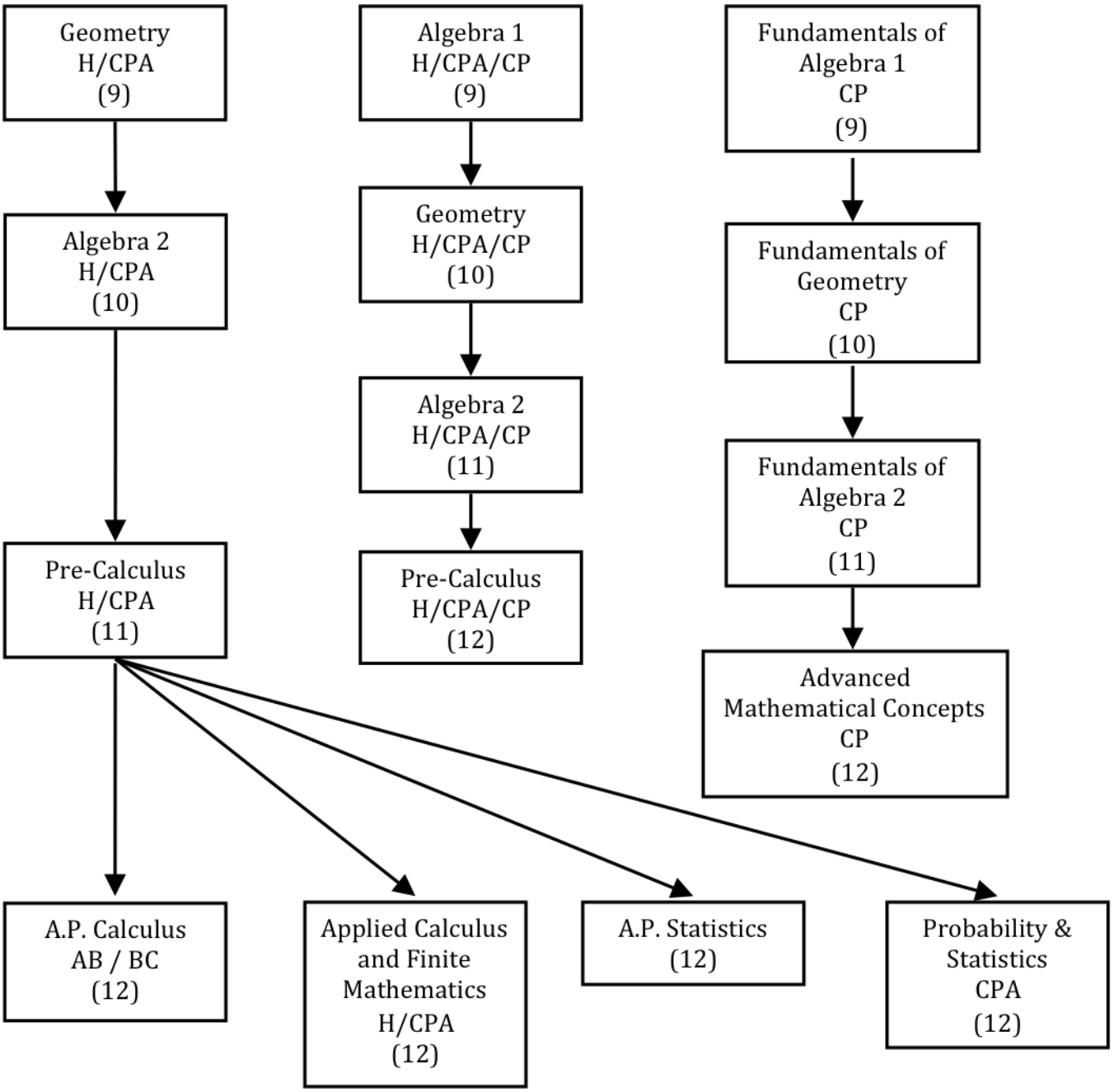
Mathematics is a course that requires the student to continually apply and increase the level of learning, day to day. It is therefore expected that each student will be prepared for class and will participate in his or her class. This requires that all homework and additional studying be completed in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

Online Courses

Students wishing to take a class online or at a local college so they can advance in their math track, must fill out an online course approval form. The form must be completed before the summer break.

Mathematics Sequences



Lower School Options

Algebra 1 (H, CPA, CP; Grade 9) 5 credits
This course is the foundation for all future math courses at the high school and college level. Students will learn how to solve problems algebraically and graphically. Among the concepts studied are: solving linear equations and inequalities, linear functions and their graphs, solving systems of equations and inequalities, exponential properties and functions, operations with polynomials, and solving quadratic equations.

Fundamentals of Algebra 1 (CP, Grade 9) 5 credits
This course is the first year of a four-year math program. The course will reinforce and develop fundamental math skills needed for future math courses. Topics include: a brief review of pre-algebra skills, solving equations and inequalities, solving and applying proportions, writing and graphing functions and linear functions, solving systems of equations and inequalities, and exponents and exponential functions. Note to students who plan to play sports in college: The NCAA has not approved 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. Students in Honors Geometry will have more emphasis on independent investigative tasks to help them develop a further understanding of the topics and relate to their knowledge of Algebra.

Basic Math Connections 1 (Grades 9-10) 5 credits
This course 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; number patterns; powers and exponents; variables and expressions; integers; solving one-step equations; combining like terms; distributive property; factoring; absolute value; square roots; ratios; fractions; decimals; percentages; coordinate system; graphing; probability; mean, median, mode, and range; area of rectangle, parallelogram, triangle, trapezoid, and circle; circumference of a circle and volume of a prism and cylinder. Concepts will be covered at a slow pace with multiple opportunities for drill and practice in preparation for the MCAS Mathematics test. Note to students who plan to play sports in college: The NCAA has not approved this class as a core course requirement.

Fundamentals of Geometry (CP, Grade 10) 5 credits
This course is the second year of a four-year math program. The course will continue to develop algebra skills and explore the essential concepts of geometry. Topics include: reasoning in geometry, parallel and perpendicular lines, parallel lines and angles, polygon properties, circles, area, Pythagorean Theorem and special right triangles, volume, and probability and statistics. Note to students who plan to play sports in college: NCAA has not approved this class as a core course requirement.

Basic Mathematics (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.

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, 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 covering the basic concepts of both algebra and geometry utilizing an integrated approach. This course will extend student knowledge in algebra, and geometry and will introduce statistics and probability. Concepts will be covered at a slow pace, with multiple opportunities for drill and practice in preparation for the MCAS Math test. Note to students who plan to play sports in college: The NCAA has not approved this class as a core course requirement.

Basic Math II (Grades 9-12) 5 credits
This course, the first in a two-year sequence, is designed to provide a review of basic operations practice as well as an introduction to pre-algebra and pre-geometry skills utilizing an integrated approach. This course will prepare students for entrance into Basic Math Connections I and is intended for students who are preparing to take the MCAS Mathematics test. A variety of topics are introduced, including number line; place value; order of operations; exponents and integers; mean, median, and mode; ordered pairs; coordinate grid; lines and angles; perimeter and area. Note to students who plan to play sports in college: The NCAA has not approved this class as a core course requirement.

Basic Math III (Grades 9-12) 5 credits
This course, the second in a two-year sequence, is designed to provide a review of basic operations practice as well as an introduction to pre-algebra and pre-geometry skills utilizing an integrated approach. This course will prepare students for entrance into Basic Math Connections I and is intended for students who are preparing to take the MCAS Mathematics test. A variety of topics are introduced, including number line; place value; order of operations; exponents and integers; mean, median, and mode; ordered pairs; coordinate grid; lines and angles; perimeter and area. Note to students who plan to play sports in college: The NCAA has not approved this class as a core course requirement.

Basic Math Connections III/IV (Grades 10-12) 5 credits
Utilizing an integrated approach, this course further extends student knowledge in algebra, geometry, and basic statistics and probability. Concepts will be covered at a slow pace with multiple opportunities for drill and practice to prepare students for the MCAS Math test. Note to students who plan to play sports in college: The NCAA has not approved this class as a core course requirement.

Consumer Math I/II (Grades 9-12) 5 credits
Students will be introduced to or review applicable, real-life math skills. Students will practice working with individual finances, measurements, calculating percentages, and time. Household budgets, personal credit cards, and checking accounts may be utilized to teach the real-life application of math skills. Further real-life math projects will be developed based on students' individual goals and interests. Note to students who plan to play sports in college: The NCAA has not approved this class as a core course requirement.

Upper School Options

Math I/II (CP, Grades 11/12) 5 credits
This course is formatted 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. Note to students who plan to play sports in college: The NCAA has not approved this class as a core course requirement.

Fundamentals of Algebra 2 (CP, Grade 11) 5 credits
This course is the third year of a four-year math program designed to prepare students for an entry-level college mathematics course. The course will spend time strengthening previously learned math skills. Topics include: operations on real numbers; properties of exponents; solving multi-step equations and inequalities involving fractions; factoring; operations with polynomials and rational expressions; unit measurements and significant figures; solving and graphing systems of two equations and inequalities; and basic trigonometric functions. Note to students who plan to play sports in college: The NCAA has not approved this class as a core course requirement.

Advanced Mathematical Concepts (CP, Grade 12) 5 credits
This course is the fourth year of a four-year math program designed to prepares students for an entry-level college mathematics course. Topics include: simplifying and factoring polynomial expressions; solving quadratic equations; rational expressions and equations; radical expressions and equations; and systems of linear equations. Note to students who plan to play sports in college: The NCAA has not approved this class as a core course requirement.

Pre-Calculus (H, CPA, CP; 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).

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).

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).

Advanced Placement Calculus AB (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 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. (TI-83/84 TI84 Plus, or HP Prime)

Advanced Placement Calculus BC (AP, Grade 12) 7.5 Credits

This course is an extension of Calculus AB rather than an enhancement; it includes all the topics covered in AB as well as parametric, polar, and vector representations of functions. 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. Students who take the BC exam will receive an exam score for AB calculus as well. (TI-83/84 TI84 Plus, or HP Prime)