

Westmont High School

Mathematics Department

The Mathematics Department will offer the following courses:

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| Integrated Math 1 | AP Statistics |
| Integrated Math 2 | AP Calculus AB |
| Integrated Math 3 | AP Calculus BC |
| Integrated Math 3 STEM | Computer Programming |
| Integrated Math 4/Pre-calculus | AP Computer Science A |

Integrated Math 1 (Prerequisite: Grade 8 Common Core Mathematics)

This is a one-year college prep course that meets state graduation requirements. This course includes the following topics: An overview of functions (linear, quadratic, and exponential) represented by function notation, graphs, and tables; Linear equations and inequalities in one and two variables; Geometric constructions; Congruence and rigid motion; Geometric relationships including properties of triangles, parallel lines, quadrilaterals, and circles; Analyzing and interpreting data in one and two variables.

Integrated Math 2 (Prerequisite: Integrated Math 1 or equivalent)

This is a one-year college prep course that meets state graduation requirements. This course includes the following topics: Coordinate Geometry; Quadratic Functions; Quadratic Equations; Similarity; Trigonometric ratios; Probability.

Integrated Math 3 (Prerequisite: Integrated Math 2 or equivalent)

This is a one-year college prep course that meets state graduation requirements. This course includes the following topics: Statistics of random processes; Properties of Circles and Conic Sections; Trigonometric Functions; Exponential Functions; Advanced overview of functions (including composite and inverse functions); Rational and polynomial expressions, equations, and functions. This course will complete the 3-year Integrated Math series that covers the Common Core State Standards for Mathematics that will be tested in 11th grade.

Integrated Math 3 STEM (Prerequisite: Integrated Math 2 or equivalent)

This course is designed for students who are interested in pursuing STEM fields in college. This course is an enhanced course and not an honors course. This course will cover all of the topics listed above in Integrated Math 3, as well as vectors, complex numbers, and advanced trigonometric function analysis. This course will complete the 3-year Integrated Math series that covers the Common Core State Standards for Mathematics that will be tested in 11th grade and includes a variety of the “plus” standards not required for the exam.

Integrated Math 4/Pre-Calculus (Prerequisite: Integrated Math 3 or equivalent)

This is a one-year college prep course that extends the Integrated Mathematics series. This course will include a deeper exploration of trigonometric, rational, piecewise, exponential and logarithmic functions. Students will explore applications of complex numbers and vectors as well as broaden their understanding of statistical regression and probability.

AP Calculus AB (Prerequisite: Integrated Math 3 STEM, IM4/ Precalculus, or equivalent)

AP Calculus AB is roughly equivalent to a first semester college calculus course. This class emphasizes a multi-representational approach to calculus, with concepts, results and problems being expressed graphically, numerically, analytically and verbally. Students explore connections among the various representations of limits, derivatives, and integrals.

AP Calculus BC (Prerequisite: AP Calculus AB or equivalent)

AP Calculus BC is roughly equivalent to both first and second semester college calculus courses. This class is an extension of Calculus AB rather than an enhancement; common topics require a similar depth of understanding. In addition to the topics covered in Calculus AB, students learn advanced integration techniques and analyze polar, parametric, and vector functions. This course also includes the study of power series and various methods to determine convergence or divergence of a series. Students become familiar with Maclaurin series for common functions and general Taylor series representations. Additional topics include the radius and interval of convergence and operations on power series.

AP Statistics (Prerequisite: Integrated Math 3 or equivalent)

The AP Statistics course is equivalent to a one-semester, introductory, non-calculus-based college course in statistics. This course introduces students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. There are four themes in the AP Statistics course: exploring data, sampling and experimentation, anticipating patterns, and statistical inference. Students use technology, investigations, problem solving, and writing as they build conceptual understanding.

Computer Programming (Prerequisite: strong math skills)

This course is an introduction to computers and programming. The course is designed to introduce students who have sufficient math background to the fundamentals of computer programming and data manipulation. Through a project-oriented approach, students will explore a variety of programming systems and languages to create interactive applications and systems. By collaborating in a hands-on environment, students will learn problem solving, software design, debugging strategies, and the foundations of computer science (data structures, procedures, and algorithms). Students will work on projects (both individual and team) in the areas of graphics and games and animation and art, all using open-source software tools such as Scratch, Python, JavaScript and Java. This course is excellent preparation for Advanced Placement Computer Science.

AP Computer Science A (Prerequisite: Integrated Math 3 or equivalent)

The AP Computer Science A course is an introductory course in computer science. Because the design and implementation of computer programs to solve problems involve skills that are fundamental to the study of computer science, a large part of the course is built around the development of computer programs that correctly solve a given problem. These programs should be understandable, adaptable, and, when appropriate, reusable. At the same time, the design and implementation of computer programs is used as a context for introducing other important aspects of computer science, including the development and analysis of algorithms, the development and use of fundamental data structures, the study of standard algorithms and typical applications, and the use of logic and formal methods.