

## The Mathematics Department Mission Is...

To develop problem solvers that  
persevere, communicate effectively,  
reason mathematically, and  
attend to precision.

## We Believe that...

All students can succeed in

Mathematics.

Collaboration leads to success

Math needs to be Accessible to all

High expectations produce great  
learning.



## Department Members

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DuPage High School  
District 88

# Curriculum Showcase



WILLOWBROOK  
HIGH SCHOOL

Mathematics Department

# GENERAL INFORMATION

## GRADUATION REQUIREMENTS:

2 Semesters—Algebra

2 Semesters—Geometry

Geometry, Geometry Honors, Algebra Honors with Geometry

2 Semesters—Mathematics Beyond Geometry

Advanced Algebra and Trig, Advanced Algebra and Trig Honors, Algebra 2

4th Year Math Courses

Into to Quant Lit and Stats, Elmhurst College

Algebra, Pre-Calculus,

Pre-Calculus Honors,

AP Calculus AB, AP Calculus BC, AP Statistics,

**Electives**

AP Computer Science,

AP Computer Science Principles

Computer Science 2: Mobile App Development

CyberSecurity

**\*All students are required to take and pass three years of mathematics.**

**Be Respectful,  
Be Responsible,  
Be Engaged**



## Mathematics Course Descriptions

### Algebra

Is designed to prepare students to use algebraic concepts, terms, and symbols to solve problems. The course includes performing operations on real numbers and algebraic expression, solving equations in one and two variables, solving quadratic equations, using graph relationships, and data analysis.

### Algebra Honors with Geometry

Is designed for students who have had an Algebra course and/or have a strong mathematics background as shown by performance in Junior High and standardized test scores. The course will include all topics of Algebra with an Integrated approach to applications of Plane Geometry. This course will fulfill the Geometry Credit required for Graduation and allow students great access to Advanced Placement courses during senior year.

### Geometry

Is the study of plane Geometry and includes some three-dimensional Geometry. Algebra is used as a tool to enhance the understanding of geometric concepts.

### Geometry Honors

Is the study of the mathematical system that develops plane and solid geometry through formal proof. In depth Algebra applications are used throughout the course.

### Algebra 2

Is designed to reinforce and expand algebraic concepts: including complex numbers; solving equations; linear inequalities; systems of linear equations and inequalities; quadratics; polynomials; radicals; exponential functions; and logarithms.

### Advanced Algebra and Trigonometry

Is designed to reinforce and expand algebraic concepts: including: solving equations; systems of linear equations; polynomials; radicals; quadratics; conic sections; exponential functions, logarithms, statistics and trigonometry.

### Advanced Algebra and Trigonometry Honors

Contains the traditional topics of an advanced algebra course in addition to trigonometry, sequences and series, matrices.

### Quant Lit. and Statistics

Is designed to prepare students for college level general mathematics courses. The College Placement Test **ALEKS** will be incorporated throughout the year to prepare students to take the official college placement test. Quant Lit will explore mathematics concepts through real world applications and projects.

### College Algebra- Elmhurst College Credit

Students taking College Algebra will experience an online college course taught by an Elmhurst College professor with the guidance and support of a Willowbrook teacher. Successful completion earns students transcripted, college credit. Topics include: Review of algebra, equations, functions and transformations, inequalities and quadratic functions, systems of linear equations and inequalities, and polynomials.

### Precalculus

Prepares the student for the study of calculus. Topics include sequences and series; polynomial functions; exponential and logarithmic functions; analytic geometry; complex numbers; trigonometry and circular functions.

### Precalculus AP

Prepares the student for the study of calculus and the AP test. Topics include sequences, series, limits; polynomials, rationals, logarithmic, and exponential functions; analytic geometry; complex numbers; trigonometry, parametric equations, circular functions; polar coordinates; vectors and determinants.

### Calculus AB

Is designed to prepare the student for the Calculus AB Advanced Placement Examination. A satisfactory score on this exam could give the student credit and advanced placement at college. This course includes limits and continuity; differentiation of algebraic functions; applications of the derivative; the definite integral; trigonometric and exponential functions; formal integration; applications of the integral.

### Calculus BC

Is designed to prepare the student for the Calculus BC Advanced Placement Examination. A satisfactory score on this exam could give the student credit and advanced placement at college. This course includes Calculus AB Topics and polar coordinates; vectors; parametrically defined functions; sequences and series; elementary differential equations.

### AP Statistics

Is designed to prepare the student for the Statistics Advanced Placement Examination. A satisfactory score on this exam could give the student credit and advanced placement in college. This course includes analysis of data, planning and conducting a research study, producing models using probability and simulation, and methods of statistical inference. Students who plan to take an AP science course in their senior year will benefit greatly from AP Statistics in the junior year.

### AP Computer Science Principles

This is an introductory computing course for all students. Students will use computer science to solve problems and to also explain how computing innovations and computing systems—including the internet—work, explore their potential impacts, and contribute to a computing culture that is collaborative and ethical.

### Advanced Placement Computer Science

Will introduce many of the programming concepts that are covered in a first year college computer science course and prepare the student for the Computer Science Advanced Placement Exam. Using the Java Language, the topics include: string manipulation, recursion, analysis of searching and sorting algorithms, structures, and classes.

### Cyber-Security

This course exposes students to the field of cybersecurity through problem-based learning, algorithmic thinking, computational thinking and critical thinking.

### CS 2: Mobile App Development

Continues the development of computer programming, but is specific to programming applications for mobile devices. Students use previous knowledge learned through Computer Science or AP Computer Science with the programming language LUA to create the apps. Students will start with the basics and templates as they build towards creating their very own app.