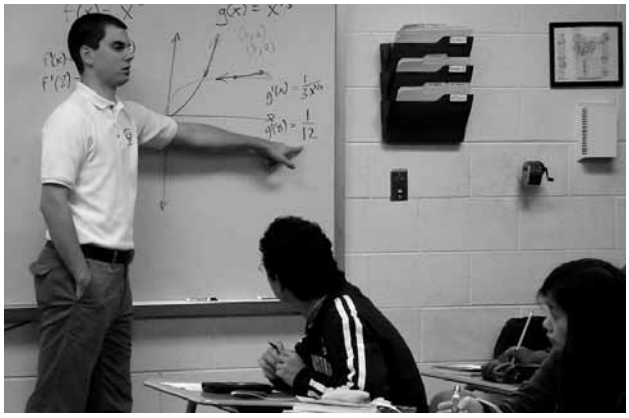
MATHEMATICS



Philosophy Statement

The need to understand, apply, and communicate mathematics in everyday life has never been greater. A high quality mathematics education equips students with an understanding of the world around them and the capacity to be successful in it. Mathematics is a way of approaching new challenges through exploring, reasoning, visualizing, and problem solving with the goal of communicating the relationships observed and the problems solved.

The Mathematics Department is committed to empowering all students to think critically, reason effectively, and become problem solvers. The department is committed to providing curriculum, instruction, and assessment that foster these attributes in our students.

The department also believes that technology is an important tool that enhances student learning. While paper and pencil are still appropriate in many situations, the demands of an ever-changing technological world mandate that every student be a competent user of technology. Calculators and computers are widely used at home and in the workplace. Use of these devices in mathematics will match the realities of everyday life, develop students' reasoning skills, and promote the understanding and application of mathematics. The TI-84+ graphing calculator is required in all courses. For more information, the department's calculator policy can be found in the student handbook or by visiting the math department link on the school website.

Mathematics
Course Descriptions

- It would be to the student's advantage to have earned a grade of "C" or better to advance to the next level.

Advanced Placement Calculus AB
Course No.: 8014
Prerequisite: Precalculus
Credit: 1.0 / Full Year
Fees:
Grades: 10, 11, 12
Other:

Advanced Placement Calculus AB is a college level course whose topics are prescribed by the College Board. Extensive work is done in the areas of elementary functions and differential calculus, as well as in some of the topics of integral calculus. Students are expected to take the Advanced Placement examination. Students who successfully complete the course and AP examination may receive credit and/or advanced placement for a one-semester college calculus course.

Advanced Placement Calculus BC
Course No.: 8016
Prerequisite: Precalculus Honors
Credit: 1.0 / Full Year
Fees:
Grades: 10, 11, 12
Other:

Advanced Placement Calculus BC is a college level course whose topics are prescribed by the College Board. Extensive work is done in the areas of elementary functions, differential calculus, and integral calculus. Some fundamental work is also done in the areas of sequences and series and differential equations. Students are expected to take the Advanced Placement examination. This course content is equivalent to two semesters of college calculus. Students who successfully complete the course and AP examination may receive credit and/or advanced placement for a two-semester college calculus course.

Advanced Placement Computer Science
Course No.: 8018
Prerequisite: Computer Science Honors
Credit: 1.0 / Full Year
Fees: $20.00
Grades: 10, 11, 12
Other:

Advanced Placement Computer Science (JAVA) is a college level course whose topics are prescribed by the College Board. The course covers materials that would normally comprise three or more hours of college level computer science course work. Topics include object oriented programming, methodology, inheritance, classes, case study analysis, array processing, data types, iteration, and selection. Students are expected to attain mastery of fundamental programming techniques. Students who successfully complete the course and AP examination may receive credit and/or advanced placement for a one-semester college computer science course.

Advanced Placement Statistics
Course No.: 8020
Prerequisite: Algebra II or Algebra II Honors
Credit: 1.0 / Full Year
Fees:
Grades: 10, 11, 12
Other:

Advanced Placement Statistics is a college level course whose topics are prescribed by the College Board. The course introduces students to the major concepts and tools for collecting, analyzing and drawing conclusions from data. Students are exposed to four broad conceptual themes: exploring data, planning a study, calculating probability and performing statistical inference. Students will complete a number of projects each semester. Students who successfully complete the course and AP examination may receive credit and/or advanced placement for a one-semester introductory college statistics course.

Algebra I
Course No.: 8024
Prerequisite: Placement
Credit: 1.0 / Full Year
Fees:
Grades: 9, 10, 11, 12
Other:

Algebra I topics include properties of real numbers, linear equations and inequalities and their graphs, solving equations, systems of linear equations, algebraic expressions, quadratic equations, functions, operations with polynomials and radicals, properties of exponents, factoring, general problem solving, critical thinking, and elementary probability concepts.

Algebra I (1.5 Period Option)
Course No.: 8025
Prerequisite: Placement
Credit: 1.5 / Full Year
Fees:
Grades: 9, 10, 11, 12
Other: Meets 1.5 consecutive periods each day.

Algebra I (1.5 Period Option) is a course designed for students not ready for the pace of a single period Algebra I course. Topics include properties of real numbers, linear equations and inequalities and their graphs, solving equations, systems of linear equations, algebraic expressions, quadratic equations, functions, operations with polynomials and radicals, properties of exponents, factoring, general problem solving, critical thinking, and elementary probability concepts. This course fulfills the Algebra I component of Illinois' math graduation requirement.

Algebra II
Course No.: 8030
Prerequisite: Algebra I and Geometry. By department recommendation only, a student may take Trigonometry concurrently with this course during semester 2.
Credit: 1.0 / Full Year
Fees:
Grades: 10, 11, 12
Other:

Algebra II (does not include Trigonometry) includes such topics as the real number system, functions and relations, linear functions, systems of linear equations and inequalities, quadratic functions, exponential and logarithmic functions, rational functions, irrational algebraic functions, complex numbers, and matrices. A strong emphasis is placed on problem solving and real life applications.

Algebra II Honors
Course No.: 8032
Prerequisite: Geometry Honors or Placement
Credit: 1.0 / Full Year
Fees:
Grades: 10, 11, 12
Other:

Algebra II Honors offers fast paced and in-depth coverage of polynomial, rational, inverse, exponential, and logarithmic functions. Other topics include equations, graphs, complex numbers, and matrices. Second semester includes an in depth study of trigonometry, including right triangle trig, law of sines/cosines, identities, graphing of trig functions, and sinusoidal modeling.

Calculus I Honors
Course No.: 8034S
Prerequisite: Precalculus II
Credit: 0.5/Semester 2 only
Fees:
Grades: 10, 11, 12
Other:

Calculus I Honors begins with the study of limits and their properties. Other topics include differentiation, applications of differentiation, and an introduction to integration.

Computer Science Honors
Course No.: 8041F, 8042S
Prerequisite: Geometry, concurrent enrollment in Geometry Honors or Placement
Credit: 0.5 / Semesters 1 and 2
Fees: $10.00
Grades: 9, 10, 11, 12
Other:

Computer Science Honors (Alice) is a course for any student interested in computer programming. The student will use Alice to learn fundamental programming concepts in the context of creating 3-D animated movies and simple

video games. In Alice, 3-D objects (e.g., people, animals, and vehicles) populate a virtual world and students create programs to animate these objects. Topics include programming methodology, iteration, data selection, function design, and arrays. The student will receive a firm foundation of computer programming needed to take the Advanced Placement Computer Science course.

Geometry
Course No.: 8050
Prerequisite: Algebra I or Placement
Credit: 1.0 / Full Year
Fees:
Grades: 9, 10, 11, 12
Other:

Geometry students will learn to recognize and understand various geometric shapes and solids, and know their properties. They will develop deductive reasoning ability and use it on formal proofs of geometric concepts. The course includes topics such as measurement, points, lines, planes, angles, triangles, parallel lines, formal proof, polygons, similarity, right triangles, right triangle trigonometry, circles, area, surface area and volume.

Geometry Honors
Course No.: 8054
Prerequisite: Placement
Credit: 1.0 / Full Year
Fees:
Grades: 9, 10
Other:

Geometry Honors offers fast paced and in-depth coverage of all Geometry topics (see Geometry course descriptions for further information). The course will also include coordinate geometry, non-right triangle trigonometry, loci of points and a brief look at non-Euclidean geometry.

Informal Geometry
Course No.: 8060
Prerequisite: Algebra I
Credit: 1.0 / Full Year
Fees:
Grades: 10, 11, 12
Other:

Informal Geometry is similar to Geometry with the difference being a light emphasis on formal "proofs". Informal Geometry will study shapes and sizes and their uses in real life. Students will study area, volume, congruency, similarity, special right triangles, and right triangle trigonometry.

Intermediate Algebra II
Course No.: 8062
Prerequisite: Informal Geometry or Geometry
Credit: 1.0 / Full Year
Fees:
Grades: 11, 12
Other:

Intermediate Algebra II is a second year algebra course designed for students not ready for the pace of the Algebra II course. Students will study linear and exponential relationships, relations and functions, systems of linear equations and inequalities, matrices, quadratic functions, variation, rational functions, and radical functions. The instruction is designed and paced in a way to help students both learn and retain mathematical concepts while connecting them to the real world.

Precalculus
Course No.: 8005
Prerequisite: Algebra II Honors or Trigonometry. By department recommendation only, a student may take this course concurrently with semester 1 Trigonometry.
Credit: 1.0 / Full Year
Fees:
Grades: 10, 11, 12
Other:

Precalculus includes the study of functions and their graphs. The course covers polynomial, rational, exponential, logarithmic, and inverse functions, linear inequalities, absolute values, and conic sections. Other topics include counting principles, probability, the Binomial Theorem, sequences and series, polar and parametric equations, vectors, limits and introductory topics in calculus.

Precalculus Honors
Course No.: 8007
Prerequisite: Algebra II Honors. The equivalent of a semester of Trigonometry is required to elect this course.
Credit: 1.0 / Full Year
Fees:
Grades: 10, 11, 12
Other:

Precalculus Honors begins with a review of polynomial functions and their applications. Other topics include exponential and logarithmic functions, analytic geometry, conic sections, polar equations and graphs, parametric equations, vectors in two and three dimensions and their applications, counting principles, probability, the Binomial Theorem, sequences and series, limits and an introduction to calculus.

Precalculus I
Course No.: 8009S
Prerequisite: Trigonometry
Credit: 0.5 / Semester 2 only
Fees:
Grades: 10, 11, 12
Other:

Precalculus I includes the study of functions and their graphs. The course covers polynomial, rational, exponential, logarithmic, and inverse functions, linear inequalities, absolute values, and conic sections.

Precalculus II
Course No.: 8011F
Precalculus I
Credit: 0.5/Semester 1 only
Fees:
Grades: 10, 11, 12
Other:

Precalculus II includes the study of counting principles, probability, the Binomial Theorem, sequences and series, polar and parametric equations, vectors, and a review of trigonometry.

Statistics
Course No.: 8071F, 8072S
Prerequisite: Algebra II or Algebra II Honors
Credit: 0.5 / Semesters 1 and 2
Fees:
Grades: 11, 12
Other:

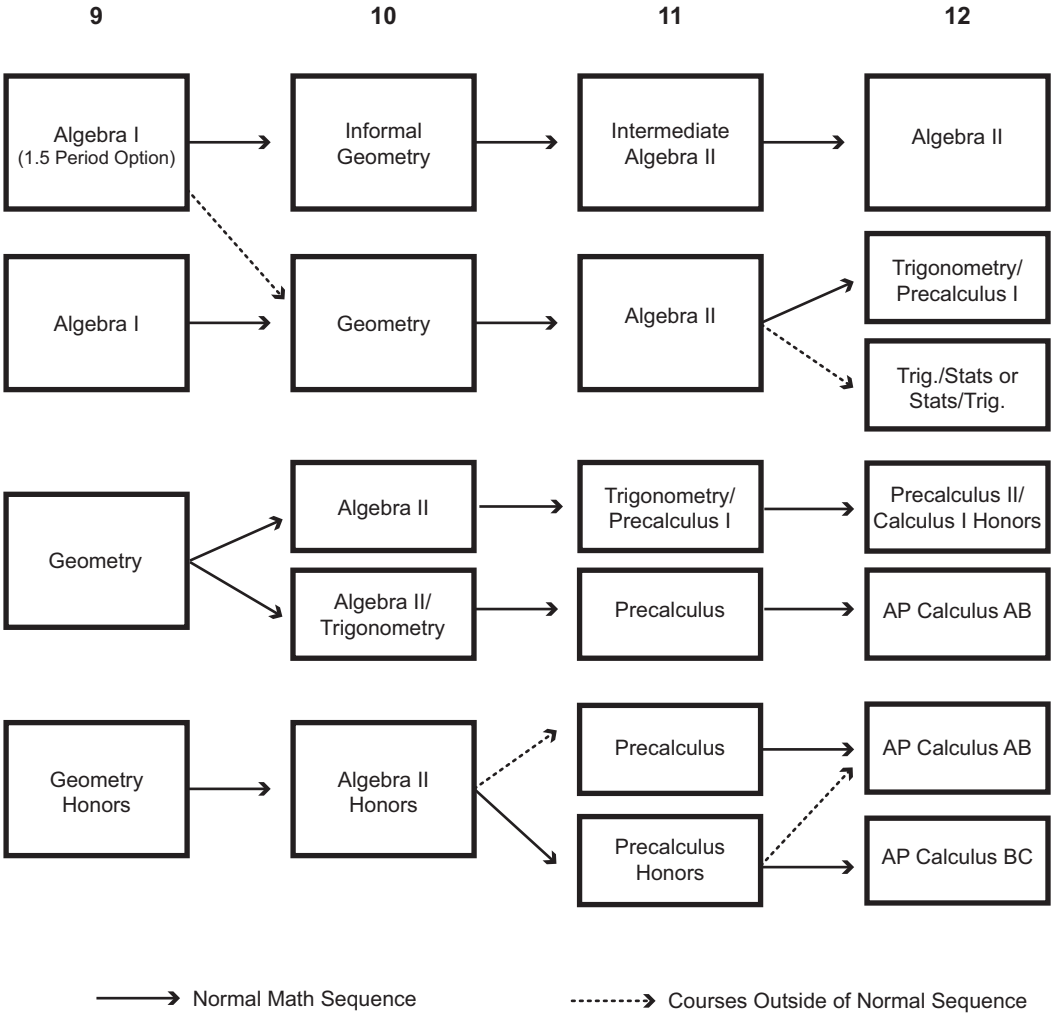
Statistics introduces students to the major concepts and tools for collecting, analyzing and drawing conclusions from data. Topics include experimental design, describing data using numerical measures and graphical displays, probability and probability distributions, and hypothesis testing.

Trigonometry
Course No.: 8077F, 8078S
Prerequisite: Algebra II; a student may take this course concurrently with second semester Algebra II or with first semester Precalculus by department recommendation only.
Credit: 0.5 / Semesters 1 and 2
Fees:
Grades: 10, 11, 12
Other:

Trigonometry is a course that covers applied trigonometry, including right triangle trigonometry, law of sines and cosines, graphing of trigonometric functions, and sinusoidal modeling. The course also covers identities, trigonometric equations, inverse functions, introduction to polar topics, and topics required for the study of Calculus.

Mathematics Department

Course Sequences



Electives – See course descriptions for prerequisites

- AP Statistics
- AP Computer Science*
- Computer Science Honors*
- Business Math (Bus. Ed. Dept.)*

* This course is not accepted as a math credit by some colleges and universities.