

MATHEMATICS

Each student enrolled in a mathematics course is expected to have his or her own graphing calculator. Graphing calculator requirements may differ by class. Please refer to the course descriptions.

Algebra I Advanced

Prerequisite: Pre-Algebra

This course addresses topics at an honors level and is designed to accommodate the curricular needs of the most successful students with an established record of success in previous mathematics courses. This course is presented at the non-honors level of instruction. Algebra uses variables and symbols for unknown values to extend the laws of arithmetic. The student will apply algebraic concepts and skills to solve word problems as well as symbol based problems. This course will include the study of the real number system, linear equations and inequalities, properties of exponents, radicals, polynomials and rational expressions. Various factoring methods are presented. Concepts and applications of modeling and simple probability are introduced. Applications to real-world situations are woven throughout the course. A TI-Nspire CAS graphing calculator is required. *One credit*

Geometry Advanced

Prerequisite: Algebra I.

Geometry explores the basic structure of Euclidean plane and solid geometry through the use of deductive reasoning proof and problem solving supported by algebraic concepts. Topics include proof, congruence, polygons, area, volume, elementary constructions, circles and coordinate geometry. The goals of this course are development of spatial and visualization skills, understanding of relationships between geometric elements and application of concepts to assist in problem solving. The course also emphasizes the development of logical reasoning based upon identification and use of valid premises and conclusions. A TI-84 graphing calculator is required. *One credit*

Geometry Honors

Prerequisite: Algebra I AB/BC and department recommendation.

This course addresses topics at an honors level and is designed to accommodate the curricular needs of the most successful students with an established record of success in previous mathematics courses. Geometry explores the basic structure of Euclidean plane and solid geometry through the use of deductive reasoning by proof and problem solving supported by algebraic concepts. Topics include proof, congruence, polygons, area, volume, elementary constructions, circles and coordinate geometry. The goals of this course are development of spatial and visualization skills, understanding of relationships between geometric elements and application of concepts to assist in problem solving. The course also emphasizes the development of logical reasoning based upon identification and use of valid premises and conclusions. A TI-84 graphing calculator is required. *One credit*

Algebra II Advanced

Prerequisite: Geometry.

This course is a continuation of the study of algebra. The use of abstractions and unknown quantities introduced in Algebra I is extended to a more thorough examination of polynomial,

rational, exponential, logarithmic and radical functions and expressions. Sequences and elementary matrix operations are explored. Students are introduced to right-angle trigonometry and topics in probability. Methods of factoring, originally introduced in Algebra I, are extended and refined. Particular emphasis is placed upon the properties of functions and refinement of problem-solving skills. A TI-84 graphing calculator is required. *One credit*

Algebra II Honors

Prerequisite: Geometry Honors and department recommendation.

This course addresses topics at an honors level and is designed to accommodate the curricular needs of the most successful students with an established record of success in previous mathematics courses. Algebra II Honors is a continuation of the study of algebra. The use of abstractions and unknown quantities introduced in Algebra I is extended to a more thorough examination of polynomial, rational, exponential, logarithmic and radical functions and expressions. Sequences and elementary matrix operations are explored. Students are introduced to selected topics in trigonometry, parametric and conics. Methods of factoring, originally introduced in Algebra I, are extended and refined. Particular emphasis is placed on the properties of functions and refinement of analytic problem-solving skills. A TI-84 graphing calculator is required. *One credit*

Precalculus

Prerequisite: Algebra II Advanced.

Precalculus completes the formal study of the elementary functions begun in Algebra I and Algebra II. Previously introduced topics in algebra are reinforced. Students focus on the use of technology, modeling, and problem solving involving data analysis, trigonometric and circular functions, their inverses, polar coordinates, complex numbers, conics, and quadratic relations. Discrete topics include The Binomial Theorem, probability and matrices. This course is not intended to prepare students for Advanced Placement Calculus AB / BC. A TI-84 graphing calculator is required. *One credit*

Precalculus Honors

Prerequisite: Algebra II Honors and department recommendation.

This course is designed for the successful and well-motivated honors tier mathematics student seeking preparation for the study of calculus at the collegiate level or at the Advanced Placement (AP) Calculus AB/BC level. Emphasis is placed upon expansion of previously introduced topics in mathematics as well as refinement of analytic methods of analysis. Topics include examination of polynomial, trigonometric, exponential, logarithmic, rational and radical functions. Additional topics are sequences, series, parametric equations, vector-valued functions, polar equations and conic forms. The course will culminate in an examination of the limit process, derivatives and integrals as an introduction to calculus. As follow-on courses, students will be recommended for either AP Calculus AB or AP Calculus BC. The TI-89 graphing calculator is required. *One credit*

Calculus

Prerequisite: Precalculus.

This is an introductory course in topics in both differential and integral calculus. Topics include an informal treatment of a limit, continuity, derivatives and integrals of elementary and trigonometric functions. Connections between algebraic and graphical methods of analysis are emphasized. Students will apply methods in calculus to real-world problems. This course does not address the range of topics required for success on the Advanced Placement Calculus national examination. A TI-84 graphing calculator is required. *One credit*

Advanced Placement Calculus AB

Prerequisite: Precalculus Honors and mathematics department recommendation.

This course provides a study of elementary and transcendental functions in calculus. Course content corresponds to the syllabus established by the College Board Advanced Placement Program and equates to approximately one semester of college calculus. Students will take the AP Calculus (AB) Examination in May from which placement and/or credit may be awarded at the collegiate level if a qualifying score is achieved. Topics include limits and their properties, differentiation, applications of the derivative, curve sketching, integration, applications of integration including area and volume, logarithmic differentiation, simple differential equations and slope fields. This course requires the use of the TI-89 graphing calculator. *One credit*

Advanced Placement Calculus BC

Prerequisites: Precalculus Honors and mathematics department recommendation.

This course provides an advanced study of elementary and transcendental functions in calculus. Course content includes topics outlined in the syllabus by the College Board Advanced Placement Program. The successful student will be prepared to participate in the AP Calculus (BC) Examination in May. Topics include limits, differentiation and applications of the derivative, numerical integration, integration and applications of the integral, volume of irregular figures, differential equations and slope fields, integration by partial fractions, integration by parts, differentiation and integration of parametrically defined equations, arc length, improper integrals, sequences and series including Taylor polynomials, Maclaurin series, power series, and vector-valued functions. This course requires the use of the TI-89 graphing calculator. *One credit*