MATHEMATICS *

Course Offerings	Gr. 9	Gr. 10	Gr. 11	Gr. 12	Grading Level
Foundations of Algebra	X				I
Algebra I		X			I
Advanced Algebra I	X				II
Honors Algebra I	X				III
Geometry		X	X	X	I
Advanced Geometry	X	X	X	X	II
Honors Geometry	X	X	X		III
Algebra II			X	X	I
Advanced Algebra II	X	X	X	X	II
Honors Algebra II	X	X	X	X	III
Precalculus		X	X	X	II
Honors Precalculus		X	X	X	III
Honors Calculus			X	X	III
AP Calculus AB			X	X	III
AP Calculus BC				X	III
Foundations of College Mathematics				X	I
Statistics			X	X	II
Honors Statistics			X	X	III
AP Statistics			X	X	III
Please see course listings for required prerequisites.					

All courses are designed to meet the New Jersey Student Learning Standards for Mathematics.

*Some courses may assign summer work.

Foundations of Algebra

Length: Year   Credits: 5
Grade level: 9

This course is designed to introduce students to the fundamental concepts and applications of Algebra in a real-world context. Topics include: algebraic expressions, proportional reasoning and percents, linear equations and inequalities, graphing linear functions, order of operations, and a system of equations. Students will use graphing calculators and hands-on activities to gain an understanding of fundamental algebraic concepts and the knowledge required for Algebra I.

Algebra I

Length: Year   Credits: 5
Grade level: 10
Prerequisite: Introduction to Algebra

Students in this course will explore algebra through its relationship with geometry, the physical and social sciences, and real world situations. Topics such as systems of equations and inequalities, exponents and exponential functions, polynomials and factoring, quadratic functions and equations, radical expressions and equations, and probability will be explored. This course is designed to develop students' technological and problem-solving abilities. High school proficiency skills will be embedded within the course.

Advanced Algebra I

Length: Year   Credits: 5
Grade Level: 9

This course is the foundation for all subsequent academic mathematics courses. It is designed for students who have a solid foundation in basic arithmetic and an understanding of the real number system. Topics include: the order of operations, factoring, solving and graphing linear equations and inequalities, operations with polynomials and exponents, systems of equations and the solution of word problems using variables and mathematical relationships. There is an introduction to domain and range, and an exploration of linear and quadratic equations as functions and their inverses

Honors Algebra I

Length: Year   Credits: 5
Grade Level: 9
Prerequisites: Prior academic achievement

The same topics will be taught in Honors Algebra I as in the Advanced Algebra I course. However, there is a much greater level of rigor and challenge. The expectation is that students in an Honors course are more mathematically astute and mature, and are capable of maintaining an appropriate level of academic independence. This course is designed to prepare students to pursue additional advanced-level mathematics courses.

Geometry

Length: Year   Credits: 5
Grade Level: 10, 11, 12
Prerequisite: Algebra I

This course will emphasize and focus on in-depth problem solving skills as well as an understanding of important geometry concepts through their connection to real world applications. Topics include: properties of triangles, polygons and circles, inductive and deductive reasoning leading to the development of formal proofs, and geometric probabilities. High School proficiency skills will be embedded into the course curriculum.

Advanced Geometry

Length: Year   Credits: 5
Grade Level: 9, 10, 11, 12
Prerequisites: Advanced Algebra I OR prior academic achievement in Algebra I

The course begins with an array of terms, notations and illustrations to describe and represent geometric relationships among points, lines, planes, angles and figures, such as bisection, parallelism, perpendicularity, congruence and similarity. Students will be using and justifying mathematical reasoning by developing informal and formal proofs. Students will develop approaches to finding areas of plane figures (related to polygons and circles), and surface area and volume of three-dimensional figures.

Honors Geometry

Length: Year   Credits: 5
Grade Level: 9, 10, 11
Prerequisites: Honors Algebra I OR prior academic achievement in Advanced Algebra I

The same topics will be covered in Honors Geometry as in Advanced Geometry; however, more difficult problems and more rigorous proofs will be selected throughout the course. The expectation is that students in an Honors course are more mathematically astute and mature, and are capable of maintaining an appropriate level of academic independence. Compass and straightedge constructions will be required of the students.

Algebra II
Length: Year   Credits: 5
Grade Level: 11, 12
Prerequisites: Algebra I and Geometry

Algebra II, like Advanced Algebra II, is designed to reinforce and extend the content primarily studied in Algebra I, including: systems of equations and inequalities, quadratic, polynomial, radical, rational, exponential, and logarithmic functions. Real world situations are modeled using graphs, tables, and algebraic descriptions.   The Algebra II course provides additional supports and reinforcement in organization and the fundamentals. Potentially as a student's last secondary math course, this course is designed to provide further development of the logic, reasoning, and problem-solving needed to be prepared for a career or access to college.

Advanced Algebra II
Length: Year   Credits: 5
Grade Level: 9, 10, 11, 12
Prerequisites: Advanced Algebra I and Advanced Geometry OR prior academic achievement in Algebra I, Geometry

Algebra II is designed to reinforce and extend the content primarily studied in Advanced Algebra I, including: systems of equations and inequalities, quadratic, polynomial, radical, rational, exponential, and logarithmic functions. Real world situations are modeled using graphs, tables and algebraic descriptions, and provide further development of students' logic and reasoning in problem-solving.

Honors Algebra II
Length: Year   Credits: 5
Grade Level: 9, 10, 11, 12
Prerequisites: Honors Algebra I and Honors Geometry OR prior academic achievement

The same topics will be covered in Honors Algebra II as in the Advanced Algebra II course but with greater rigor and more challenging problems. The expectation is that students in an Honors course are more mathematically astute and mature, and are capable of maintaining an appropriate level of academic independence. This course is designed for the self-motivated student of mathematics who plans to pursue additional advanced mathematics courses, including Calculus. A graphing calculator (TI-84) is recommended for this course, and all subsequent Honors courses.

Pre-Calculus
Length: Year   Credits: 5
Grade Level: 10, 11, 12
Prerequisites: Advanced Geometry and Advanced Algebra II

This course is designed for the mathematics student with a solid foundation in both Algebra II and Geometry. Students continue developing their mathematical reasoning through problem solving and the applications of algebraic and trigonometric functions.   Emphasis is placed on independent student discovery learning and logical development of concepts. Topics covered include relations and functions, inverses, exponential and logarithmic functions, polynomial division, the rational root theorem, the unit circle, the laws of sines and the law of cosines, trigonometric equations. A graphing calculator (TI-84) is used regularly in this course.

Honors Pre-Calculus
Length: Year   Credits: 5
Grade Level: 10, 11, 12
Prerequisites: Honors Algebra II

This challenging course will prepare students for success in Calculus. Students will participate in a rigorous approach to the following topics: relations and functions, systems of equations, polynomial division and the rational root theorem, polynomial inequalities, as well as trigonometric functions, proofs, graphs, and equations. The expectation is that students in this course are mathematically sophisticated, and capable of maintaining a high level of academic independence.   Students will be expected to maintain a brisk pace with a challenging curriculum. The problems used emphasize logical reasoning and the applications of the mathematical content.   A graphing calculator (TI-84) is used extensively in this course.

Honors Calculus
Length: Year   Credits: 5
Grade Level: 11, 12
Prerequisites: Honors Precalculus OR prior academic achievement in Precalculus

Calculus is offered to college-bound students who displayed mathematical capability and success in Geometry, Algebra II, and Precalculus. Topics to be covered include slope of a curve, continuity and limits, rate of change, the derivative and its application, and the integral and its application. Although a variety of criteria will be used to evaluate achievement, grades earned will primarily be based on tests and quizzes. The purpose for using this method is to prepare students for the reality of college level assessment. A graphing calculator (TI-84) is used regularly in this course.

AP Calculus AB
Length: Year   Credits: 5
Grade Level: 11, 12
Prerequisites: Honors Precalculus

AP Calculus AB is designed for the serious and motivated mathematics student who has demonstrated consistently outstanding performances in his/her high school mathematics courses. The student who enrolls in AP Calculus AB will be expected to work at a college level, with significant study and preparation outside the classroom. Students are encouraged to take the AP Calculus Exam. Successful performance on this exam may result in students earning credit, AP, or both when they enter college. A graphing calculator (TI-84) is recommended for this course.

AP Calculus BC
Length: Year   Credits: 5
Grade Level: 12
Prerequisites: AP Calculus AB

In addition to a review of Calculus AB material, students will study integration by parts and partial fractions, improper integrals, Euler's method, logistic differential equations, L'Hopital's Rule, polynomial approximations and series, and the analysis of planar curves given in polar parametric and vector form. Students are encouraged to take the AP Calculus Exam. Successful performance on this exam may result in students earning credit, AP, or both when they enter college. A graphing calculator (TI-84) is recommended for this course.

Foundations of College Mathematics
Length: Year   Credits: 5
Grade Level: 12
Prerequisite: Algebra I and Geometry

This course is designed to give senior students a more sophisticated understanding of the fundamentals of mathematics and basic algebra. Emphasis is on developing the connections among foundational concepts, and their applications. Students will begin with an Accuplacer-like assessment, and the results will guide the focus of instruction for the specific group of students in the class. The primary objective is to prepare students planning to attend a community college for success on the Accuplacer exam in the spring. The topics of study include: operations with fractions, ratios, and proportional reasoning, equations and inequalities, and polynomials.

Statistics
Length: Year   Credits: 5
Grade Level: 11, 12
Prerequisite: Advanced Algebra II

Look at the world through a statistician's eyes, and you will be amazed at what you see. Statistics is an upper level, elective mathematics class. This course was designed to provide juniors and seniors a detailed introduction of college-level statistics, emphasizing conceptual understanding. Students will work with data collection, descriptive statistics, probability, and technological tools to analyze statistics. The main foci of the course will be exploring univariate and bivariate data, using probability theory to produce models, and making statistical summaries and conclusions. Students will describe data sets in terms of 'typical' values and spread, and work with methods of data collection, methods of determining probability, and various probabilities, and various probability distributions. Students will use multiple representations to present data including written descriptions, numerical statistics, formulas, and graphs. The course concludes with a large-scale probability project.

Honors Statistics
Length: Year   Credits: 5
Grade Level: 11, 12
Prerequisite: Advanced Algebra II

Analytical skills related to data are necessary in almost every branch of collegiate study. Honors Statistics is an upper level, elective mathematics class that opens the world of data analysis to students. The same topics will be covered in Honors Statistics as in Statistics course but with greater rigor and a quicker pace. This course is designed to provide juniors and seniors a detailed introduction of college-level statistics, emphasizing conceptual understanding. Students will follow a curriculum similar to Statistics, that extends coursework through inferential statistics. The main foci of the course will be exploring univariate and bivariate data, using probability theory to produce models, making statistical summaries and conclusions based on inferential statistics. The course also concludes with a large-scale probability project.

AP Statistics

Length: Year   Credits: 5

Grade Level: 11, 12

Prerequisites: Honors Precalculus, OR prior academic achievement in Precalculus

This rigorous college-level course provides an in-depth study of statistics for highly motivated students. Students are introduced to the major concepts and tools used for collecting, analyzing, and drawing conclusions from data. This course is recommended for students with an interest in pursuing a career that utilizes the analysis of data. Students are encouraged to take the AP Exam in May, giving them the opportunity to earn college credit. A graphing calculator (TI-84) is used regularly in this course.

Senior ELA/Math Lab

Length: ½ Year or Full Year   Credits: 2.5 or 5

Grade Level: 12

The Senior ELA/Math Lab provides students with additional academic support in English Language Arts and Mathematics. Students are placed in the course upon review of their performance on statewide assessments. The class is coordinated with the NJ DOE portfolio appeal constructed response tasks for graduation testing requirements.