

# MATHEMATICS DEPARTMENT

## Mathematics Courses

Course	Grade Level	Prerequisite	Credit
Algebra I	9	8th Grade Math or equivalent	1
Pre-AP Algebra I	8-9	8th Grade Math or equivalent	1
Geometry	9-11	Algebra I	1
Pre-AP Geometry	9-10	Algebra I	1
Algebra II	9-12	Algebra I	1
Pre-AP Algebra II	9-11	Algebra I	1
Pre-AP Pre-Calculus	10-12	Geometry, Algebra II	1
Course	Grade Level	Prerequisite	Credit
AP Statistics	10-12	Geometry, Algebra II	1
AP Calculus AB	11-12	Pre-Calculus	1
AP Calculus BC	11-12	Pre-Calculus	1
Course	Grade Level	Prerequisite	Credit
College Prep Math Course	12	Algebra I	1
Statistics	11-12	Algebra II	1
Algebraic Reasoning	10-12	Algebra I	1
LOCAL COURSES			
Non-credit, Locally Developed Courses			
Algebra I EOC Lab	9	None	1
Math TSI Lab I-II-III	10-12	None	1, 0.5
Math SAT Lab I-II-III	10-12	None	1, 0.5

**Algebra I**

**Offered in:** 8-9    **Credits:** 1    **Level:** On level

**Prerequisites:** 8th grade math or equivalent

This course serves as the foundation for all upper level mathematics courses, and covers the following topics: Solving Equations and Inequalities, Introduction to Functions, Linear Functions, Systems of Equations and Inequalities, Exponents and Radicals, Sequences, Polynomials and Factoring, Quadratic Functions and Equations, Exponential Functions and Equations. Students will connect functions and their associated solutions in both mathematical and real-world situations. They will use technology to collect and explore data and analyze statistical relationships; they will generate and solve linear systems with two equations and two variables, and will create new functions through transformations. Students will also use mathematical relationships to generate solutions and make connections and predictions.

**Pre-AP Algebra I**

**Offered in:** 8-9    **Credits:** 1    **Level:** Pre AP

**Prerequisites:** 8th grade math or equivalent

This course serves as the foundation for all upper level mathematics courses, and covers the following topics: Solving Equations and Inequalities, Introduction to Functions, Linear Functions, Systems of Equations and Inequalities, Exponents and Radicals, Sequences, Polynomials and Factoring, Quadratic Functions and Equations, Exponential Functions and Equations. Students will connect functions and their associated solutions in both mathematical and real-world situations. They will use technology to collect and explore data and analyze statistical relationships; they will generate and solve linear systems with two equations and two variables, and will create new functions through transformations. Students will also use mathematical relationships to generate solutions and make connections and predictions. *Pre-AP Algebra I will include a more in depth study of the topics covered in Algebra I. A strong emphasis is placed on increasing the development of critical thinking and problem solving skills. The intention of this course is to prepare students for AP level math course.*

**Geometry**

**Offered in:** 9-11    **Credits:** 1    **Level:** On level

**Prerequisites:** Algebra I

In this course, students will study Transformational Geometry, Parallel and Perpendicular Lines, Relationships within Triangles, Polygons and Quadrilaterals, Congruent Triangles, Surface Area and Volume, Right Triangles and Trigonometry, Probability,

Coordinate Geometry, Similarity, Circle Measurement, Tools of Geometry, Area, Theorems about Circles, Reasoning and Proofs. Students use geometric methods, properties, and relationships as a means to recognize, draw, describe, connect, and analyze shapes and representations in the physical world. Geometry offers students many opportunities to explore geometric situations, properties of two- and three-dimensional objects, and to develop and prove conjectures using a variety of methods.

**Pre-AP Geometry**

**Offered in:** 9-10    **Credits:** 1    **Level:** Pre AP

**Prerequisites:** Algebra I

In this course, students will study Transformational Geometry, Parallel and Perpendicular Lines, Relationships within Triangles, Polygons and Quadrilaterals, Congruent Triangles, Surface Area and Volume, Right Triangles and Trigonometry, Probability, Coordinate Geometry, Similarity, Circle Measurement, Tools of Geometry, Area, Theorems about Circles, Reasoning and Proofs. Students use geometric methods, properties, and relationships as a means to recognize, draw, describe, connect, and analyze shapes and representations in the physical world. Geometry offers students many opportunities to explore geometric situations, properties of two- and three-dimensional objects, and to develop and prove conjectures using a variety of methods. *In Pre-AP Geometry students will extend their work with proofs to include additional theorems and alternative proof approaches. Emphasis will be placed on connections among Geometry and Algebra along with student's justification of reasoning. This course is intended to prepare students for AP level course work.*

**Algebra II**

**Offered in:** 10-11    **Credits:** 1    **Level:** On level

**Prerequisites:** Algebra I

In this course, students will study Functions, Absolute Value Equations and Functions, Systems of Linear Equations, Quadratic Functions and Equations, Square Root Functions and Equations, Exponential and Logarithmic Functions and Equations, Polynomials, Radical Expressions, Cubic and Cube Root Functions and Equations, Rational Functions and Equations, Data. This course reviews and builds on those concepts learned in Algebra I and Geometry by placing more emphasis on applying the basic concepts of Algebra to rational and irrational numbers. The course expands techniques in analytical geometry and trigonometry learned in Geometry as a preview of the next two courses offered. Algebra II is a course which extends the content of Algebra I and provides further development of the concept of a function.

# MATHEMATICS DEPARTMENT

## Course Descriptions

### Pre-AP Algebra II

**Offered in:** 9-11 **Credits:** 1 **Level:** Pre AP

**Prerequisites:** Algebra I

In this course, students will study Functions, Absolute Value Equations and Functions, Systems of Linear Equations, Quadratic Functions and Equations, Square Root Functions and Equations, Exponential and Logarithmic Functions and Equations, Polynomials, Radical Expressions, Cubic and Cube Root Functions and Equations, Rational Functions and Equations, Data. This course reviews and builds on those concepts learned in Algebra I and Geometry by placing more emphasis on applying the basic concepts of Algebra to rational and irrational numbers. The course expands techniques in analytical geometry and trigonometry learned in Geometry as a preview of the next two courses offered. Algebra II is a course which extends the content of Algebra I and provides further development of the concept of a function. *Pre-AP Algebra II will include a more in depth study of the topics covered in Algebra II. The intent of this course is to prepare students for AP level course work. Algebra II is the required pre-requisite for many fourth year math courses.*

### Pre AP Pre-Calculus

**Offered in:** 10-12 **Credits:** 1 **Level:** Pre AP

**Prerequisites:** Geometry, Algebra II

Pre AP Pre-Calculus is a preparation course for calculus that approaches topics from a function point of view, where appropriate, and is designed to strengthen and enhance conceptual understanding and mathematical reasoning used when modeling and solving mathematical and real-world problems. Students systematically work with functions and their multiple representations. The study of Pre AP Pre-Calculus deepens students' mathematical understanding and fluency with algebra and trigonometry and extends their ability to make connections and apply concepts and procedures at higher levels. In this course, students will study Equations and Inequalities, Graphs and Functions, Polynomial and Rational Functions, Inverse, Exponential, and Logarithmic Functions, Trigonometric Functions, the Circular Functions and Their Graphs, Trigonometric Identities and Equations, Applications of Trigonometry, Systems and Matrices, Analytic Geometry.

### College Prep Math Course

**Offered in:** 12 **Credits:** 1 **Level:** On level

**Prerequisites:** Algebra I

This course is designed to support students who do not meet

college readiness indicators for mathematics. Course content will focus on strengthening numeracy, algebraic reasoning, and developing understanding of functional relationships. This course is available for seniors only, and aims to prepare seniors for college before they graduate high school. Topics include real numbers, basic geometry, polynomials, factoring, linear equations, inequalities, quadratic equations, rational expressions, factoring techniques, radicals, and algebraic fractions, complex numbers, graphing linear equations and inequalities, quadratic equations, systems of equations, graphing quadratic equations, and an introduction to functions. Algebraic techniques are emphasized in order to successfully complete an entry-level college mathematics course.

### Statistics

**Offered in:** 11-12 **Credits:** 1 **Level:** On level

**Prerequisites:** Algebra II

In Statistics, students will build on the knowledge and skills for mathematics in Kindergarten-Grade 8 and Algebra I. Students will broaden their knowledge of variability and statistical processes as they study sampling and experimentation, categorical and quantitative data, probability and random variables, inference, and bivariate data. They will connect data and statistical processes to real-world situations. In addition, students will extend their knowledge of data analysis. In this course, students will study: statistical process sampling and experimentation, variability, categorical and quantitative data, probability and random variables, inference, bivariate data.

### Algebraic Reasoning

**Offered in:** 11-12 **Credits:** 1 **Level:** On level

**Prerequisites:** Algebra I

In Algebraic Reasoning, students will build on the knowledge and skills for mathematics in Kindergarten-Grade 8 and Algebra I, continue with the development of mathematical reasoning related to algebraic understandings and processes, and deepen a foundation for studies in subsequent mathematics courses. Students will broaden their knowledge of functions and relationships, including linear, quadratic, square root, rational, cubic, cube root, exponential, absolute value, and logarithmic functions. Students will study these functions through analysis and application that includes explorations of patterns and structure, number and algebraic methods, and modeling from data using tools that build to workforce and college readiness such as probes, measurement tools, and software tools, including spreadsheets.

**AP Statistics**

**Offered in:** 10-12    **Credits:** 1    **Level:** AP/Dual

**Prerequisites:** *Geometry, Algebra II*

Students are introduced to major concepts and tools for collecting, analyzing, and drawing conclusions from data, and are engaged in collecting, organizing, analyzing, interpreting, and reporting data using statistical formulas and processes. Students distinguish between random and biased sampling, and use statistical measures to analyze real-world phenomena. This course prepares students for the College Board’s Advanced Placement (AP) Statistics Examination for possible college (one-semester, non-calculus based statistics) credit.

**AP Calculus AB**

**Offered in:** 11-12    **Credits:** 1    **Level:** AP/Dual

**Prerequisites:** *Pre-Calculus*

Students explore functions, graphs, limits, derivatives, and integrals. This course prepares students for the College Board’s Advanced Placement (AP) Calculus AB Examination for possible college credit (first semester calculus). Students are advised to take a Calculus course in which they will be challenged, yet will perform successfully. Students may not take Calculus AB followed by Calculus BC.

**AP Calculus BC**

**Offered in:** 11-12    **Credits:** 1    **Level:** AP/Dual

**Prerequisites:** *Pre-Calculus*

Students explore all topics covered in AP Calculus AB plus additional topics including parametric, polar, and vector functions, and polynomial approximations and series. This course prepares students for the College Board’s Advanced Placement (AP) Calculus BC Examination for possible college credit (a full year of calculus). This exam also has a Calculus AB sub-score grade for students to receive first semester college calculus credit. Students are advised to take a Calculus course in which they will be challenged, yet will perform successfully. Students may not take Calculus AB followed by Calculus BC.

**Algebra I EOC Lab**

**Offered in:** 9    **Credits:**    **Level:** On level

**Prerequisites:**

The Algebra-I Lab with EOC Intervention class is designed to address the individual needs of students who show lower

performance on the State and District Assessments, in order to improve their scores and their fluency on math topics. There are two major components of this class: “Intervention” and an “Adaptive Learning Program”. Intervention (small group instruction) is designed based on a student’s performance on District Assessments and Practice STAAR Tests, needs from the main Algebra I class, suggestions from SPED/ESL departments, and the his/her STAAR test score from the previous year. After each District Assessment or mock STAAR, the grouping of students is determined along with their individual needs. When other students work on the Adaptive Learning Program individually, these dynamic groups of students will gather around a table and work with the teacher on certain topics and standards.

**Math TSI Lab (I-II-III)**

**Offered in:** 10-12    **Credits:**    **Level:** On level

**Prerequisites:**

The TSI Lab class is designed for students who have not yet been able to pass the Texas Success Initiative (TSI) Assessment and provide support and practice specific to this assessment. There are two major components of this class, “Intervention” and an “Adaptive Learning Program”. Intervention (small group instruction) is designed based on a student’s performance on TSI benchmarks. After each TSI benchmark, the grouping of students is determined along with their individual needs. When other students work on the Adaptive Learning Program individually, these dynamic groups of students will work with teachers in a small group environment.

**Math SAT Lab I-II-III**

**Offered in:** 10-12    **Credits:**    **Level:** On level

**Prerequisites:**

This class is designed to improve students’ SAT scores and their fluency on math topics for students who are college-ready, but show lower performance on SAT practice tests. SAT class is designed to teach students the core mathematical concepts and skills tested on the SAT math test. In addition to reviewing topics from pre-algebra, algebra, and geometry, students will become familiar with the format of the test and learn strategies. This course will also include a discussion of the effective use of a graphing calculator. Much time will be devoted to practice problems similar to those on the SAT.