

# MATH

## **ALGEBRA ID 1200310D**

**Grade(s): 9-11**

**Pre-Req: C/D in 8<sup>th</sup> grade math or below level 3 on state achievement test.**

The fundamental purpose of this course is to formalize and extend the mathematics that students learned in the middle grades. The critical areas, called units, deepen and extend understanding of linear and exponential relationships by contrasting them with each other and by applying linear models to data that exhibit a linear trend, and students engage in methods for analyzing, solving, and using quadratic functions. The Standards for Mathematical Practice apply throughout each course, and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations. This course will move at a slower pace than regular Algebra I and focus solely on EOC topics.

**\*This course is a one-year course and is only complete when the student takes the Algebra EOC. The Algebra EOC will count for 30% of the students grade. Student must also PASS this End of Course Exam for a Standard High School Diploma.**

## **ALGEBRA I 12003100**

**Grade(s): 9-11**

**Pre-Req: A/B in 8<sup>th</sup> grade math or C /D in 8<sup>th</sup> grade Alg 1 Honors**

The fundamental purpose of this course is to formalize and extend the mathematics that students learned in the middle grades. The critical areas, called units, deepen and extend understanding of linear and exponential relationships by contrasting them with each other and by applying linear models to data that exhibit a linear trend, and students engage in methods for analyzing, solving, and using quadratic functions. The Standards for Mathematical Practice apply throughout each course, and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations.

**\*This course is a one-year course and is only complete when the student takes the Algebra EOC. The Algebra EOC will count for 30% of the student's grade. Student must also PASS this End of Course Exam for a Standard High School Diploma.**

## **INFORMAL GEOMETRY 12063000**

**Grade(s): 10-12**

**Pre-Req: C/D in Algebra 1 or completion of Algebra 1D**

The fundamental purpose of the course in Informal Geometry is to extend students' geometric experiences from the middle grades. Students explore more complex geometric situations and deepen their explanations of geometric relationships. Important differences exist between this Geometry course and the historical approach taken in Geometry classes. For example, transformations are emphasized early in this course. Close attention should be paid to the introductory content for the Geometry conceptual category found in the high school standards. The Standards for Mathematical Practice apply throughout each course and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations. **This course may not meet math academic requirements for entrance into certain four-year universities, nor will it count for Bright Futures Scholarship opportunities.**

- **Honors Level Course Note:** Academic rigor is more than simply assigning to students a greater quantity of work. Through the application, analysis, evaluation, and creation of complex ideas that are often abstract and multi-faceted, students are challenged to think and collaborate critically on the content they are learning.
- **Advanced Placement Course:** Students earn 6 Quality Points on their weighted GPA for these courses; however, to earn college credit, the student must pass an end of the year course given by the College Board.
- **LH Courses:** LH is designated Local Honors. This means that the district has deemed the course honors; however, the state has not. Some scholarships, and post secondary institutions may not consider these courses Honors level.

## **GEOMETRY D 1206310D**

**Grade(s): 11-12**

**Pre-Req: Successful completion of Algebra I**

The fundamental purpose of the course in Geometry is to formalize and extend students' geometric experiences from the middle grades. Students explore more complex geometric situations and deepen their explanations of geometric relationships, moving towards formal mathematical arguments. Important differences exist between this Geometry course and the historical approach taken in Geometry classes. For example, transformations are emphasized early in this course. Close attention should be paid to the introductory content for the Geometry conceptual category found in the high school standards. The Standards for Mathematical Practice apply throughout each course and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations. This course will move at a slower pace than Geometry, and focus solely on EOC Topics.

**\*This course is a one-year course and is only complete when the student takes the Geometry EOC. The Geometry EOC will count for 30% of the student's grade.**

## **GEOMETRY 12063100**

**Grade(s): 9-10**

**Pre-Req: Successful completion of Algebra I with a grade of A/B/C+ or successful completion of Algebra 1 Honors with grades of B/C/D**

The fundamental purpose of the course in Geometry is to formalize and extend students' geometric experiences from the middle grades. Students explore more complex geometric situations and deepen their explanations of geometric relationships, moving towards formal mathematical arguments. Important differences exist between this Geometry course and the historical approach taken in Geometry classes. For example, transformations are emphasized early in this course. Close attention should be paid to the introductory content for the Geometry conceptual category found in the high school standards. The Standards for Mathematical Practice apply throughout each course and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations.

**\*This course is a one-year course and is only complete when the student takes the Geometry EOC. The Geometry EOC will count for 30% of the student's grade.**

## **GEOMETRY HONORS 12063200**

**Grade(s): 9-10**

**Pre-Req: Successful completion of Algebra I Honors with a grade of A/B+**

The fundamental purpose of the course in Geometry is to formalize and extend students' geometric experiences from the middle grades. Students explore more complex geometric situations and deepen their explanations of geometric relationships, moving towards formal mathematical arguments. Important differences exist between this Geometry course and the historical approach taken in Geometry classes. For example, transformations are emphasized early in this course. Close attention should be paid to the introductory content for the Geometry conceptual category found in the high school standards. The Standards for Mathematical Practice apply throughout each course and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations.

**\*This course is a one-year course and is only complete when the student takes the Geometry EOC. The Geometry EOC will count for 30% of the student's grade.**

- **Honors Level Course Note:** Academic rigor is more than simply assigning to students a greater quantity of work. Through the application, analysis, evaluation, and creation of complex ideas that are often abstract and multi-faceted, students are challenged to think and collaborate critically on the content they are learning.
- **Advanced Placement Course:** Students earn 6 Quality Points on their weighted GPA for these courses; however, to earn college credit, the student must pass an end of the year course given by the College Board.
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## **LIBERAL ARTS MATH 2 12073100**

**Grade(s): 11-12**

**Pre-Req: Successful completion of Algebra I and Geometry**

Liberal Arts Mathematics 2 is a course designed to provide algebraic, geometric, and statistical real-world experiences using hands-on laboratory activities, including those from occupational contexts. Student experiences will involve explanation of new concepts, development of understanding of core mathematical ideas, and creation of a foundation of a more formal study of mathematics. The content may include, but not be limited to, structure and properties of the real number system, exponents, square roots, absolute value and scientific notation, variables, algebraic expressions, polynomials, operations with polynomials, varied means for analyzing and expressing patterns, relations and functions, coordinate geometry and graphing of inequalities, linear and quadratic equations, varied solution strategies for inequalities and linear and quadratic equations, data analysis concepts and techniques including introductory statistics and probability, geometric constructions, terminology and fundamental properties of geometry, inductive reasoning and informal proof, introduction of deductive reasoning, measurement of plane and solid figures, exploration and application of geometric relationships including parallelism, perpendicularity, congruence, and similarity, and symmetry and transformational geometry. **This course may not meet math academic requirements for entrance into certain four-year universities, nor will it count towards Bright Futures scholarships.**

## **ADVANCED TOPICS IN MATH 12983100**

**Grade(s): 10-12**

**Pre-Req: Successful completion of Algebra I and Geometry**

Advanced Topics in Math is a bridge-course between Algebra 1 and Algebra 2 and is designed to develop the algebraic and geometric concepts and processes that can be used to solve a variety of real-world and mathematical problems. Algebra and geometry will be integrated throughout the course. The content may include, but not be limited to, structure and properties of the real number system, varied means for analyzing and expressing patterns, relations, and functions, including words, tables, rules, sequences and series, graphs, and algebraic equations, coordinate geometry and graphing of linear and quadratic functions and inequalities, varied solution strategies for linear and quadratic functions and inequalities and for systems of equations, operations with rational algebraic equations, data analysis concepts and techniques including introductory statistics and probability, fundamental concepts of logic including Venn diagrams, properties of circles, application of the axiomatic approach in geometric and algebraic proofs, algebraic application in geometry including the Pythagorean Theorem, its converse, and related geometric theorems, and the derivation of formulas for surface area and volume.

## **ALGEBRA 2 12003300**

**Grade(s): 9-12**

**Pre-Req: Successful completion of Algebra I and Geometry with an A/B+**

Building on their work with linear, quadratic, and exponential functions, students extend their repertoire of functions to include polynomial, rational, and radical functions. Students work closely with the expressions that define the functions, and continue to expand and hone their abilities to model situations and to solve equations, including solving quadratic equations over the set of complex numbers and solving exponential equations using the properties of logarithms. The Standards for Mathematical Practice apply throughout each course and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations.

**\*This course is a one-year course and is only complete when the student takes the Algebra 2 EOC. The Algebra 2 EOC will count for 30% of the student's grade.**

- **Honors Level Course Note:** Academic rigor is more than simply assigning to students a greater quantity of work. Through the application, analysis, evaluation, and creation of complex ideas that are often abstract and multi-faceted, students are challenged to think and collaborate critically on the content they are learning.
- **Advanced Placement Course:** Students earn 6 Quality Points on their weighted GPA for these courses; however, to earn college credit, the student must pass an end of the year course given by the College Board.
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## **ALGEBRA 2 HONORS 12003400**

**Grade(s): 9-12**

**Pre-Req: Successful completion of Algebra I and Geometry Honors with an A/B+**

Building on their work with linear, quadratic, and exponential functions, students extend their repertoire of functions to include polynomial, rational, and radical functions.<sup>2</sup> Students work closely with the expressions that define the functions, and continue to expand and hone their abilities to model situations and to solve equations, including solving quadratic equations over the set of complex numbers and solving exponential equations using the properties of logarithms. The Mathematical Practice Standards apply throughout each course and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations.

**\*This course is a one-year course and is only complete when the student takes the Algebra EOC. The Algebra EOC will count for 30% of the student's grade.**

## **TRIGONOMETRY HONORS PAIRED WITH ANALYTIC GEOMETRY HONORS 12113000/12063300**

**Grade(s): 10-12**

**Pre-Req: Successful completion of Algebra II with an A/B**

Trigonometry/Analytic Geometry is a course designed for the study of circular and trigonometric functions and their applications. The content shall include, but not be limited to, circular and trigonometric functions and their inverses, trigonometric equations, solutions of right and oblique triangles, and trigonometric form of complex numbers, linear equations, graphs and curve sketching, Cartesian and polar coordinate systems, analytic proofs, vectors, conic sections, including transformations of axes, equations and graphs in polar form, parametric equations and applications to real-world problem solving.

## **PROBABILITY AND STATS HONORS 12103000**

**Grade(s): 10-12**

**Pre-Req: Successful completion of Algebra II with a C or above or successful completion of Algebra 2 Honors or above.**

Probability and Statistics is a full year course designed to explore the concepts of probability, elementary statistics, and hypothesis testing. Topics shall include, but not be limited to random experiments, probability concepts, permutations, combinations, sample space, binomial distribution, concepts of descriptive statistics, measures of central tendency, measures of variability, normal distribution, correlation and regression, hypothesis testing using the normal distribution, the  $t$ -distributions, the chi-squared distributions, the  $F$ -distributions, and applications of various nonparametric statistical tests.

## **PRE-CALCULUS HONORS 12023400**

**Grade(s): 10-12**

**Pre-Req: Successful completion of Geometry and Algebra II Honors with A/B+**

The purpose of this course is to emphasize the study of functions and other skills necessary for the study of calculus. Topics shall include, but not be limited to, polynomial, rational, exponential, inverse, logarithmic, and trigonometric/circular functions; sequences; series; theory of limits; vectors; conic sections; polar coordinates; symbolic logic; mathematical induction; and matrix algebra.

## **AP Calculus AB 12023100**

**Grade(s): 11-12**

**Pre-Req: Pre-Calculus with a grade of A/B**

AP Calculus AB is a course designed to offer students college level mathematics under the guidelines of the Advanced Placement Program. Topics shall include, but not be limited to, elementary functions, hyperbolic functions, limits and continuity, derivatives, differentiation including partial differentiation, applications of the derivative, antiderivatives, definite integrals, indeterminate forms, and applications of the integral. The student enrolled in this course will be expected to take the Advanced Placement Examination in Calculus AB.

- **Honors Level Course Note:** Academic rigor is more than simply assigning to students a greater quantity of work. Through the application, analysis, evaluation, and creation of complex ideas that are often abstract and multi-faceted, students are challenged to think and collaborate critically on the content they are learning.
- **Advanced Placement Course:** Students earn 6 Quality Points on their weighted GPA for these courses; however, to earn college credit, the student must pass an end of the year course given by the College Board.
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### **AP Calculus BC 12023200**

**Grade(s): 11-12**

**Pre-Req: Calculus A/B with grades of A/B**

Advanced Placement Calculus BC is a course designed to offer students college level mathematics under the guidance of the Advanced Placement Program. Topics shall include, but not be limited to, elementary functions, hyperbolic functions, limits and continuity, derivatives, differentiation including partial differentiation, applications of the derivative, anti-derivatives, definite integrals, indeterminate forms, applications of the integral, sequences of real numbers, convergence, and elementary differential equations. The student enrolled in this course will be expected to take the Advanced Placement Examination in Calculus BC.

### **AP Statistics 12103200**

**Grade(s): 11-12**

**Pre-Req: Statistics with grades of A/B or Pre-Calculus (grades A/B) or Calculus (any level)**

AP Statistics is a course designed to give students college level mathematics under the guidance of the Advanced Placement Program. Topics shall include, but not be limited to, exploratory data (observing patterns and departing from data), planning a study (deciding what and how to measure), producing models using probability and simulation, and statistical inference. The student enrolled in this course will be expected to take the Advanced Placement Examination in Statistics.

- **Honors Level Course Note:** Academic rigor is more than simply assigning to students a greater quantity of work. Through the application, analysis, evaluation, and creation of complex ideas that are often abstract and multi-faceted, students are challenged to think and collaborate critically on the content they are learning.
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