

MATHEMATICS

In this changing world, those who understand and can do mathematics will have significantly enhanced opportunities and options for shaping their futures. Colleges and universities are requiring three years and recommending four years of high school mathematics, through Pre-Calculus, along with coursework in computer applications or programming. Vocational and technical schools require a strong math background for many of their programs.

The mathematics curriculum in District 196 addresses the concerns that have been identified in mathematics education. The curriculum provides materials that use current technology, provides real-life applications, integrates with other subjects, and presents material needed by all students in the future. Success in any mathematics course requires a solid background from previous coursework, proper study skills, and a commitment to daily work.

All students are required to earn nine (9) trimester credits. Students must complete courses in Intermediate Algebra, Geometry, and Algebra II. For all students, computer programming credits do not count toward the mathematics graduation requirement. New ninth graders will be enrolled in one of three levels based on input from an eighth grade mathematics teacher, previous grades in mathematics, and standardized test scores.

Some students take two mathematics courses concurrently. Students who desire to double up with two mathematics courses in one year should seek faculty advice and will be required to have a faculty member recommend a waiver for the prerequisite.

Mathematics Curriculum

These are the recommended paths for the majority of students. Some students may be enrolling in these courses in other years.

9th Grade

Choose one required class:	☐ Intermediate Algebra Concepts ☐ Intermediate Algebra ☐ Honors Geometry
Electives available:	Intro to Computers**, or Computer Programming I**, or Computer Programming II** (These computer classes are one trimester courses and do not have to be taken in the same year)

** counts as an elective credit towards graduation, not as a math credit

10th Grade

Choose one required class:	☐ Geometry Concepts ☐ Geometry ☐ Honors Geometry ☐ Honors Algebra II (May be taken in addition to Geometry, teacher recommendation only)
Electives available:	Numeracy 10** (taken with Geometry - teacher recommendation only) AP Computer Science Principles** Intro to Computers**, or Computer Programming I**, or Computer Programming II** (These computer classes are one trimester courses and do not have to be taken in the same year)

** counts as an elective credit towards graduation, not as a math credit

11th Grade

Choose one required class: _____ Algebra II Concepts
 _____ Algebra II
 _____ Honors Algebra II
 _____ Pre-Calculus
 _____ AP Pre-Calculus

Electives available: AP Statistics (may be taken with AP Pre-Calculus or Pre-Calculus)
 AP Computer Science**
 Numeracy 11** (taken with Algebra II - teacher recommendation only)
 AP Computer Science Principles**
 Intro to Computers**, or Computer Programming I**, or Computer Programming II**
 (These computer classes are one trimester courses and do not have to be taken in the same year)

** counts as an elective credit towards graduation, not as a math credit

12th Grade

_____ Technical Math
_____ College Algebra, Probability, and Statistics (CAPS)
_____ Pre-Calculus (may be taken with AP Statistics and/or AP Computer Science)
_____ AP Calculus AB (may be taken with AP Statistics and/or AP Computer Science)
_____ AP Calculus BC (may be taken with AP Statistics and/or AP Computer Science)
_____ AP Statistics
_____ AP Computer Science**
_____ AP Computer Science Principles**
_____ Intro to Computers**, or Computer Programming I**, or Computer Programming II**
 (These computer classes are one trimester courses and do not have to be taken in the same year)
_____ Multivariable Calculus (may be taken with AP Statistics and/or AP Computer Science)
_____ Linear Algebra/Differential Equations

NOTE: Certain classes may be taken concurrently as advised by the current math teacher.

NOTE: Students who are successful in Intermediate Algebra may move up a level to Honors Geometry upon recommendation of the instructor. Students who are successful in Geometry may move up a level to Honors Algebra II upon recommendation of the instructor.

NOTE: Technical Mathematics, Geometry Concepts, Intermediate Algebra Concepts and Algebra II Concepts may not meet college entrance requirements.

Students enrolled in all levels of Geometry, Algebra II, Technical Mathematics, CAPS, Pre-Calculus, AP Statistics, AP Calculus AB and AP Calculus BC must have a graphing calculator. The Texas Instruments TI-83 Plus or TI-84 is required.

COURSES OFFERED TO STUDENTS IN GRADES 9, 10, 11, AND 12

0601 Intermediate Algebra Concepts A

Grades: 9, 10, 11, 12

0602 Intermediate Algebra Concepts B

Prerequisite: Algebra I

0603 Intermediate Algebra Concepts C

Intermediate Algebra Concepts is a study of both linear and non-linear topics in Algebra. Topics include operations, solving equations, linear functions, systems of equations, quadratic equations, polynomials, and statistics. There will be an introduction to probability and simulation, transformations and connections to Geometry. Continuation in this course is contingent upon earning a passing grade the previous trimester. A scientific calculator is required but a TI-83 Plus or TI-84 graphing calculator is recommended.

Note: This is a year-long course; students should register for all three courses.

0604 Intermediate Algebra A

Grades: 9, 10, 11, 12

0605 Intermediate Algebra B

Prerequisite: Algebra I

0606 Intermediate Algebra C

Intermediate Algebra is a study beyond linear topics in Algebra. Topics include systems of equations, quadratic equations, polynomials, data and statistics, probability and simulation, transformations and connections to Geometry. Continuation in this course is contingent upon earning a passing grade the previous trimester. A scientific calculator is required but a TI-83 Plus or TI-84 graphing calculator is recommended.

Note: This is a year-long course; students should register for all three courses.

0604EX Fast-Paced Intermediate Algebra A

Grades: 9, 10, 11, 12

0605EX Fast-Paced Intermediate Algebra B

Prerequisite: Algebra I

0606EX Fast-Paced Intermediate Algebra C

Fast-paced Intermediate Algebra A, B, C is a study beyond linear topics in Algebra. It is more in-depth than Intermediate Algebra and moves at an accelerated pace. You must have a teacher recommendation to enroll in this course. Topics include systems of equations, quadratic equations, polynomials, data and statistics, probability and simulations, transformations and connections to Geometry. Continuation in this course is contingent upon receiving a passing grade the previous trimester. A scientific calculator is required but a TI-83 Plus or TI-84 graphing calculator is recommended.

Note: This is a year-long course; students should register for all three courses.

0607 Honors Geometry A

Grades: 9, 10, 11, 12

0608 Honors Geometry B

Prerequisite: Intermediate Algebra or equivalent

0609 Honors Geometry C

This course is an in-depth study of the concepts of Geometry in two and three dimensions. Topics include measurement, formulas, coordinate geometry, similarity, logic, proof and trigonometry. Concepts will be studied in the context of applications, concrete demonstrations, and connections to Algebra. Continuation in this course is contingent upon receiving a passing grade the previous trimester. A TI-83 Plus or TI-84 graphing calculator is required. A protractor, compass, and ruler are also required.

Note: This is a year-long course; students should register for all three courses.

0616 Introduction to Computers

Grades: 9, 10, 11, 12

Prerequisite: None

This foundational course is designed to provide students with a comprehensive understanding of essential computer concepts and skills. This course serves as a gateway for individuals looking to develop a strong foundation in computing, whether for personal or professional use. Gain new skills and knowledge in word processing, spreadsheets, binary, the history of computers, computer structures, and the basics of computer programming.

NOTE: This course is a math elective and does not qualify as one of the math credits required for graduation.

NOTE: This course is not an NCAA core academic class.

0617 Computer Programming I

Grades: 9, 10, 11, 12

Prerequisite: None

Learn how to use Python language for programming the computer. Become familiar with displaying information on the screen, using variables, creating branching statements, and designing loops. This course will use the online platform of Code High School for course curriculum. **NOTE: This course is a math elective and does not qualify as one of the math credits required for graduation.** **NOTE: This course is not an NCAA core academic class.**

0618 Computer Programming II

Grades: 9, 10, 11, 12

Prerequisite: Computer Programming I with minimum grade of "C" or Instructor Permission

Deepen your skill in solving complex problems using Python. Learn about lists, arrays, nested loops, string manipulation, sorts, searches, subroutines, and I/O operations. Please register for this course during the same academic year as Computing Programming I. **NOTE: This course is a math elective and does not qualify as one of the math credits required for graduation.** **NOTE: This course is not an NCAA core academic class.**

COURSES OFFERED TO STUDENTS IN GRADES 10, 11, AND 12

0625 Algebra II Concepts A

Grades: 10, 11, 12

0626 Algebra II Concepts B

Prerequisite: Geometry Concepts

0627 Algebra II Concepts C

This course will closely examine linear, exponential and quadratic functions. Topics will be studied in the context of graphical, numerical and algebraic interpretations. Probability and statistics will be a strong component of this course. Technology will be integrated throughout and the TI-83+ or TI-84 is required. Continuation in this course is contingent upon receiving a passing grade the previous trimester. **Note: Certain colleges and universities will not accept Algebra II Concepts in determining admission for students. College-bound students are strongly urged to select Algebra II.**

Note: This is a year-long course; students should register for all three courses.

0628 Algebra II A

Grades: 10, 11, 12

0629 Algebra II B

Prerequisite: Geometry, Intermediate Algebra

0630 Algebra II C

The major focus for this course will be the study of functions, including linear, quadratic, rational and exponential. Probability and statistics along with linear systems will be a strong component of this course. Trigonometry, including right triangle trigonometry, law of sines, law of cosines and circular trigonometry will be studied. The TI-83+ or TI-84 is required. Continuation in this course is contingent upon receiving a passing grade the previous trimester.

Note: This is a year-long course; students should register for all three courses.

0631 Geometry Concepts A

Grades: 10, 11, 12

0632 Geometry Concepts B

Prerequisite: Intermediate Algebra Concepts

0633 Geometry Concepts C

Basic concepts of Geometry will be reinforced through applications and concrete activities. Topics studied will include measurement, formulas in two and three dimensions, similarity, coordinate geometry, and trigonometry. Connections that require a review of algebra will be integrated throughout the course. Continuation in this course is contingent upon receiving a passing grade the previous trimester. **Note: Certain colleges and universities will not accept Geometry Concepts in determining admission for students. College-bound students are strongly urged to select Geometry.** A scientific calculator is required but a TI-83 Plus or TI-84 graphing calculator is recommended. A protractor, compass and ruler are also required.

Note: This is a year-long course; students should register for all three courses.

0634 Geometry A

Grades: 10, 11, 12

0635 Geometry B

Prerequisite: Intermediate Algebra or equivalent

0636 Geometry C

This course exposes students to the concepts of Geometry in two and three dimensions. Topics include measurement, formulas, coordinate geometry, similarity, logic, and trigonometry. Concepts will be studied in the context of applications and concrete demonstrations. Connections that require a review of Algebra will be a strong component of this course. Continuation in this course is contingent upon receiving a passing grade the previous trimester. A TI-83 Plus or TI-84 graphing calculator is required. A protractor, compass and ruler are also required.

Note: This is a year-long course; students should register for all three courses.

0637 Numeracy 10 A

Grades: 10

0638 Numeracy 10 B

Prerequisite: Intermediate Algebra Teacher Recommendation

0639 Numeracy 10 C

Tenth grade Numeracy is a course designed to help students improve their math skills and is taken in addition to Geometry. There will be an emphasis on learning a variety of mathematical and algebraic skills to improve self-monitoring and to maximize the understanding of the math content standards. In addition, there will be an emphasis on understanding word problems and effective test taking strategies to aid students on the Math MCA and ACT tests. This is a recommended year-long course. **NOTE: This course is a math elective and does not qualify as one of the math credits required for graduation. NOTE: This course is not an NCAA core academic class.**

0640 Honors Algebra II A

Grades: 10, 11, 12

0641 Honors Algebra II B

Prerequisite: Honors Geo, or Geo with minimum grade of "A"

0642 Honors Algebra II C

The major focus of this course will be the study of functions, including linear, quadratic, rational, and exponential. Probability and statistics along with linear systems and linear programming will be strong components of this course. Trigonometry, including right triangle trigonometry, law of cosines, and law of sines will be introduced. Continuation in this course is contingent upon receiving a passing grade the previous trimester. The TI-83+ or TI-84 graphing calculator is required.

Note: This is a year-long course; students should register for all three courses.

0622 Advanced Placement Computer Science Principles A

Grades: 10, 11, 12

0623 Advanced Placement Computer Science Principles B

Prerequisite: None

0624 Advanced Placement Computer Science Principles C

In addition to a focus on learning how to program, this year long AP Computer Science Principles course is also designed to help all students widen the scope of computer science through an exploration of the creative aspects as well as understanding the intellectual and everyday contributions that computing offers. The AP Computer Science Principles Assessment in May consists of two parts: a through-course portfolio submission/assessment and an end-of-course AP exam.

While the course is open to all 10th-12th grade students who are interested in the growing world of computing including programming and beyond, it may be best taken during the 11th grade year to help prepare for AP Computer Science during senior year. **NOTE: This course is a math elective and does not qualify as one of the math credits required for graduation. NOTE: This course is not an NCAA core academic class.**

Note: This is a year-long course; students should register for all three courses.

0646 Advanced Placement Computer Science A

Grades: 10, 11, 12

0647 Advanced Placement Computer Science B

Prerequisite: Honors Geometry with grade of "A"

0648 Advanced Placement Computer Science C

or Algebra II

This course is an in-depth study of the Java Programming language which provides a solid foundation for computer-related careers: computer programming, mathematics, engineering, business, and the natural sciences. Emphasis will be on gaining knowledge of computer systems--variables, expressions, input-output, conditionals, loops, object-oriented programming, classes and simple recursion. Major topics will include searching, sorting, data structures, and strings. This course will help prepare students for the AP Computer Science A exam offered each May. **NOTE: This course is a math elective and does not qualify as one of the math credits required for graduation. NOTE: This course is not an NCAA core academic class.**

Note: This is a year-long course; students should register for all three courses.

COURSES OFFERED TO STUDENTS IN GRADES 11 AND 12

0654 Numeracy 11 A

Grades: 11

0655 Numeracy 11 B

Prerequisite: Geometry Teacher Recommendation

0656 Numeracy 11 C

Eleventh grade Numeracy II is a course designed to help students improve their math skills and is taken in addition to Algebra II. There will be an emphasis on learning a variety of mathematical and algebraic skills to improve self-monitoring and to maximize the understanding of the math content standards. In addition, there will be an emphasis on understanding word problems and effective test taking strategies to aid students on the Math MCA and ACT tests. This is a recommended year-long course. **NOTE: This course is a math elective and does not qualify as one of the math credits required for graduation. NOTE: This course is not an NCAA core academic class.**

0663 Pre-Calculus A

Grades: 11, 12

0664 Pre-Calculus B

Prerequisite: Algebra II with grade of "B+" or better

0665 Pre-Calculus C

Pre-Calculus continues the study of functions. A major focus will be on the fundamental concepts of trigonometry and analytic geometry. Graphical, numerical, verbal and algebraic modeling of functions will be included and technology will be fully integrated. A significant focus will be the application of mathematics through financial literacy. This course will prepare students to take the *optional* Advanced Placement exam. Continuation in this course sequence is contingent upon receiving a passing grade the previous trimester. The TI-83+ or TI-84 graphing calculator is required.

Note: This is a year-long course; students should register for all three courses.

0666 **AP Pre-Calculus A**

Grades: 11, 12

0667 **AP Pre-Calculus B**

Prerequisite: Honors Algebra II with grade of "B+" or better

0668 **AP Pre-Calculus C**

AP Pre-Calculus fosters the development of a deep conceptual understanding of functions. This exploration of functions is designed to better prepare students for college-level Calculus and provide grounding for other mathematics and science courses. A major focus will be on graphical, numerical, verbal and algebraic modeling of functions and technology will be fully integrated. A significant focus will be on preparation for the Advanced Placement exam. Continuation in this course sequence is contingent upon receiving a passing grade the previous trimester. The TI-83+ or TI-84 graphing calculator is required.

Note: This is a year-long course; students should register for all three courses.

0669 **Advanced Placement Statistics A**

Grades: 11, 12

0670 **Advanced Placement Statistics B**

Prerequisite: Honors Algebra II or grade of "A" in Algebra II

0671 **Advanced Placement Statistics C**

This course will provide in-depth coverage of the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Topics include Exploring Data (observing patterns and departures from patterns), Planning a Study (deciding what and how to measure), Anticipating Patterns (producing models using probability and simulation), and Statistical Inference (confirming models). The goal of AP Statistics is to prepare students for success on the Advanced Placement Statistics examination. The TI-83+ or TI-84 graphing calculator is required. **Note: There is a \$5 requested donation for covering experimental and simulation costs.**

Note: This is a year-long course; students should register for all three courses.

COURSES OFFERED TO STUDENTS IN GRADES 12

0675 **College Algebra, Probability and Statistics (CAPS) A**

Grades: 11, 12

0676 **College Algebra, Probability and Statistics (CAPS) B**

Prerequisite: Algebra II

0677 **College Algebra, Probability and Statistics (CAPS) C**

College Algebra, Probability, and Statistics (CAPS) has been designed to meet the needs of seniors who intend to or are strongly considering attending college, but are not planning to pursue a post-secondary course of study with a math/science focus. The target group of students include those who demonstrate skills and abilities in mathematics that are greater than those needed for Tech Math but may be problematic for success in Pre-Calculus. This course will review main topics from all previous Algebra courses with a focus on topics offered on college math placement examinations. Included in this course is an introduction to Statistics; introducing key ideas and concepts to ease students' transition to college-level math. The TI-83+ or TI-84 graphing calculator is not required, but will be helpful in the Statistics unit.

Note: This is a year-long course; students should register for all three courses.

0679 **Advanced Placement Calculus AB A**

Grades: 12

0680 **Advanced Placement Calculus AB B**

Prerequisite: AP Pre-Calculus or Pre-Calculus

0681 **Advanced Placement Calculus AB C**

In this course, students will study rates of change, along with limits of a function. Formal differentiation and its application to real problems will be included. Students will study integration to find the area under a curve and its application to real-life problems. Calculus will be presented from graphical, numerical, and symbolic points of view. The goal is for students to obtain a strong conceptual understanding to accommodate diverse applications. A significant focus will be on preparation for the Advanced Placement exam. Continuation of this course sequence is contingent upon receiving a passing grade the previous trimester. The TI-83+ or TI-84 graphing calculator is required.

Note: This is a year-long course; students should register for all three courses.

0683 Advanced Placement Calculus BC A

Grades: 12

0684 Advanced Placement Calculus BC B

Prerequisite: AP Pre-Calculus or Pre-Calculus

0685 Advanced Placement Calculus BC C

The BC curriculum will include all topics listed for Calculus AB along with these additional topics: L'Hopital's Rule, Advanced Techniques of Integration, Euler's Method, Analysis Using Calculus of Parametric, Polar, and Vector Functions, Sequences and Series, and Taylor Polynomials. Students interested in college majors requiring two or more semesters of college Calculus should consider this course. Pacing for BC Calculus is much faster than Calculus AB. Students earning a score of 4 or 5 on the AP Calculus BC exam at the conclusion of this course usually receive credit for 2 semesters of college Calculus (subject to change based on the university/college/secondary institution). Continuing in this course is contingent upon receiving a passing grade the previous trimester. The TI-83+ or TI-84 graphing calculator is required.

Note: This is a year-long course; students should register for all three courses.

0686 Technical Mathematics A

Grades: 12

0687 Technical Mathematics B

Prerequisite: Passing grade in Algebra II or

0688 Technical Mathematics C

Algebra II Concepts

Technical Mathematics will review topics in mathematics including algebraic operations, Algebra, Geometry, Trigonometry, and Probability with a focus on practical life applications, specifically those in trades and technical careers. Hands-on laboratory activities, cooperative learning, and reading will be components of the course. Technical Mathematics is appropriate for students who experienced difficulty in Algebra II or Geometry. The TI-83+ or TI-84 graphing calculator is required.

Note: This is a year-long course; students should register for all three courses.

0693 Calculus 3: Multivariable Calculus A

Grades: 12

0694 Calculus 3: Multivariable Calculus B

Prerequisite: Math Department Recommendation

0695 Calculus 3: Multivariable Calculus C

Multivariable Calculus is the study of calculus concepts learned in BC Calculus applied to 2 and 3 dimensions. Topics include vectors in two and three dimensions, analytic geometry of three dimensions, parametric curves, partial derivatives, the gradient, optimization in several variables, multiple integration with change of variables across different coordinate systems, line integrals, and Green's Theorem. This course should only be taken by those that have passed the Advanced Placement BC Calculus exam. **Students successfully completing Multivariable Calculus may be able to earn college credit from a local post-secondary institution. Students should contact the course instructor for more information regarding articulation agreements and participating post-secondary institutions. Note: This is a year-long course; students should register for all three courses.**

0696 Calculus 4: Differential Equations with Linear Algebra A

Grades: 12

0697 Calculus 4: Differential Equations with Linear Algebra B

Prerequisite: Math Department Recommendation

0698 Calculus 4: Differential Equations with Linear Algebra C

This course covers matrix theory and linear algebra, emphasizing topics useful in other disciplines. Linear Algebra is a branch of mathematics that studies systems of linear equations and the properties of matrices. The concepts of linear algebra are extremely useful in physics, economics and social sciences, natural sciences, and engineering. Due to its broad range of applications, linear algebra is one of the most widely taught subjects in college-level mathematics. Differential Equations is about using the derivative to describe how a quantity changes. These equations are then solved and used to predict the future value of the quantity being modeled. There will be three types of techniques for making these predictions. We will use analytical methods to find formulas, qualitative and numerical techniques to find estimates for the future values of the quantity. This course should only be taken by those that have passed the Advanced Placement BC Calculus exam. **Students successfully completing Linear Algebra/Differential Equations may be able to earn college credit from a local post-secondary institution. Students should contact the course instructor for more information regarding articulation agreements and participating post-secondary institutions.**

Note: This is a year-long course; students should register for all three courses.