

# MATHEMATICS

## **ALGEBRA I (8104) 5 credits Grades: 9-12**

This course is limited to those students who have an **Individual Educational Plan (IEP)** developed with the Child Study Team. This course will present algebra as a style of thinking for formalizing patterns, functions, and generalizations. The focus will be on proficiency in recognizing and working effectively with linear and non-linear relationships and their corresponding representations in tables, graphs, and equations. Such proficiency includes competence in solving linear and non-linear equations, generating equivalent expressions, using formulas, and applying proportionality. Teaching and learning will focus on the understanding of concepts, enabling students to apply mathematical skills and make meaningful connections to life's experiences. The student's individual educational plan will determine the level of instruction and the goals for successful completion.

## **ALGEBRA 1A (8115) 5 credits Grade: 9**

This course is designed for 9<sup>th</sup> graders who have an Individualized Education Program (IEP) developed with the Child Study Team. The instruction and the level of intensity of the content are determined from the student's results of the NJASK-8 test. The student's individual educational program will determine the level of instruction and the goals for successful completion.

## **COLLEGE PREP ALGEBRA I (4210) 5 credits Grade 9**

Prerequisites:

Grade 79 or below in 8<sup>th</sup> grade Mathematics  
Identified by 8<sup>th</sup> grade teachers

This is a two-period course required for students whose math skills indicate the need for additional support as they learn Algebra I. Students will also be spending time in a computer lab for additional work and practice. This course is designed for ninth grade students as the first course of a three-year math requirement. It is for students planning to attend college, technical or trade school. This course will present algebra as a style of thinking for formalizing patterns, functions, and generalizations. The focus will be on proficiency in recognizing and working effectively with linear and non-linear relationships and their corresponding representations in tables, graphs, and equations. Such proficiency includes competence in solving linear and non-linear equations, generating equivalent expressions, using formulas, and applying proportionality. Teaching and learning will focus on the understanding of concepts, enabling students to apply mathematical skills and make meaningful connections to life experiences.

**Note: Scientific calculators will be used in the course and graphing calculators will be introduced and used periodically throughout the course. Both Scientific and Graphing calculators will be available for use in class.**

## **COLLEGE PREP ALGEBRA I (4200) 5 credits Grade 9**

Prerequisites:

Grade 80 or above in 8<sup>th</sup> grade Math

This course is designed for ninth grade students as the first course of a three-year math requirement. It is for students planning to attend college, technical or trade school. In this mathematical academic course of study students will continue to develop the algebraic skills and concepts learned in Math 8 in addition to developing the necessary algebraic skills and concepts for future competency in mathematics. The basic mathematical facts learned in previous years are extended to negative numbers, the use of letters, numbers and symbols to express ideas. In addition to the four fundamental processes, topics covered will include equalities, inequalities, open sentences, graphing, special products and factors, elementary functions, fractions, fractional equations and word problems associated with the skills mentioned. Teaching and learning will focus on the understanding of concepts, enabling students to apply mathematical skills and make meaningful connections to life's experiences. Students will be expected to pass an end of course competency assessment.

**Note: Scientific calculators will be used in the course and graphing calculators will be introduced and used periodically throughout the course. Both Scientific and Graphing calculators will be available for use in class.**

### **GEOMETRY (8105) 5 credits Grades: 9-12**

This course is limited to those students who have an **Individual Educational Plan (IEP)** developed with the Child Study Team. Algebra I must be completed before this course can be taken. This course places less emphasis on abstract concepts but rather explores relationships involving lines, triangles and quadrilaterals. Hands-on activities will enable students to make connections from concrete examples to abstract concepts. This course uses the nature of deductive and inductive reasoning, the role of defined and undefined terms, and the meaning and use of postulates and theorems leading to an understanding of the logical sequence of thought. This course integrates Algebra while investigating the properties and relationships of geometric figures through plane, solid, and coordinate geometry. The student's individual educational plan will determine the level of instruction and the goals for successful completion.

### **GEOMETRY A (8116) 5 credits Grade: 10**

Prerequisite: Algebra; teacher recommendation; IEP team recommendation

This course is limited to those students who have an Individualized Education Program (IEP) developed with the Child Study Team. The course is for those students who have successfully completed Intro to Algebra and need continued improvement in the skills and concepts needed for success in the area of algebra. This course places less emphasis on abstract concepts but rather explores relationships involving lines, triangles and quadrilaterals. Hands-on activities will enable students to make connections from concrete examples to abstract concepts. This course integrates Algebra while investigating the properties and relationships of geometric figures through plane, solid, and coordinate geometry. The student's individualized education program will determine the level of instruction and the goals for successful completion.

### **COLLEGE PREP GEOMETRY (4330) 5 credits Grades: 10-12**

Prerequisite: Algebra I (4210)

This is a two-period course required for students whose math skills indicate the need for additional support as they learn Geometry. Students will also be spending time in a computer lab for additional work and practice. This course is designed for tenth grade students as the second course of a three-year math requirement. It is for students planning to attend college, technical or trade school. This course places less emphasis on abstract concepts and explores relationships involving lines, triangles and quadrilaterals via more hands-on activities that will enable them to make connections from concrete examples to abstract concepts. This course uses the nature of deductive and inductive reasoning, the role of defined and undefined terms, and the meaning and use of postulates and theorems leading to an understanding of the logical sequence of thought. This course integrates Algebra while investigating the properties and relationships of geometric figures through plane, solid, and coordinate geometry.

### **COLLEGE PREP GEOMETRY (4300) 5 credits Grades: 9-12**

Prerequisites:

- a. Algebra I (4200)

This course is designed for students planning to attend college, technical or trade school. This course explores the fundamental areas of plane two-dimensional figures and solid or three-dimensional figures; a study of point, line and angle relationships is made. Angles related to parallel lines, circles, and triangles as well as those used to prove that two triangles are congruent or similar are studied. Formulas are used in conjunction with finding area, volume, and the perimeters of polygons. Surface area and volume of prisms, pyramids, cylinders, cones and spheres are also studied. Coordinate Geometry and transformation of figures will be integrated throughout the course. There is an emphasis on logical thinking skills as well as analytical thinking. Math websites and geometers sketchpad may also be used to enhance understanding.

### **HONORS GEOMETRY (4310) 5 credits Grades: 9-10**

Prerequisites:

- a. Algebra I minimum final grade "A" in grade 8 **OR**
- b. College Prep Algebra I (4200) final grade "A"

This course is designed for ninth and tenth grade students as the second course of a three-year math requirement. It is for students who are confident in math and are planning to attend college with a math/science focus. This course focuses on plane two-dimensional figures and solid or three-dimensional figures; a study of point, line and angle relationships is made. Angles related to parallel lines, circles, and triangles as well as those used to prove that two triangles are congruent or similar are studied. Formulas are used in conjunction with finding area, volume, and the perimeter of polygons. Surface area and volume of prisms, pyramids, cylinders, cones and spheres are studied. Coordinate Geometry and transformations of figures will be integrated throughout the course. Math websites and geometer sketchpad may also be used to enhance understanding.

**Note: The course requires the student to be highly skilled in Algebra I material. Students will be given Algebra I review material to be completed during the summer and to be submitted the first day of class. A comprehensive diagnostic test will be administered during the first week of class.**

### **ALGEBRA II (8110) 5 credits Grades: 10-12**

Prerequisite: Algebra I / Geometry; teacher recommendation; IEP team recommendation

This course is designed for those students who have an **Individual Educational Plan (IEP)** developed with the Child Study Team. It is designed to extend the skills and concepts developed in Algebra I (8104). Previous concepts that are explored in greater depth include equations, inequalities, exponents, functions, graphing, systems of equations, polynomials and radicals. New topics include higher degree equations, complex numbers, and rational expressions. An emphasis is also placed on using variables and the language of Algebra to solve a variety of comprehensive word problems relating to real world experiences. The student's individual educational plan will determine the level of instruction and the goals for successful completion.

### **ALGEBRA II A (8117) 5 Credits Grade: 10-12**

Prerequisite: Algebra I / Geometry; teacher recommendation; IEP team recommendation

This course is designed for those students who have an Individualized Education Program (IEP) developed with the Child Study Team. This class is for junior students that need to increase their proficiency in Mathematics. The course will expand on the topics discussed in Intro to Algebra and Intro to Geometry. The student's individualized education program will determine the level of instruction and the goals for successful completion.

### **COLLEGE PREP ALGEBRA II (4240) 5 credits Grades: 10-12**

Prerequisite:

- a. Algebra I (4210)
- b. Geometry (4330)

This course is designed for eleventh grade students as the third course of a three-year math requirement. It is for students planning to attend college, technical or trade school. This course is designed to extend the skills and concepts developed in Algebra 1(4210). Previous concepts that are explored in greater depth include equations, inequalities, exponents, functions, graphing, systems of equations, polynomials and radicals. New topics include higher degree equations, complex numbers, and rational expressions. An emphasis is also placed on using variables and the language of Algebra to solve a variety of comprehensive word problems relating to real world experiences.

**Note: Students are encouraged to purchase a TI-83 or TI-84 graphing calculator. Your teacher will inform you as to which calculator to purchase. A graphing calculator will be used extensively in this course. Graphing calculators will be available for use in class**

### **COLLEGE PREP ALGEBRA II (4250) 5 credits Grades: 10-12**

Prerequisite:

- a. Algebra I (4200)
- b. College Prep Geometry (4300)

This course is designed for eleventh grade students as the third course of a three-year math requirement. It is for students planning to attend college, technical or trade school. This course is designed to extend the skills and concepts developed in College Prep Algebra 1 (4200). Previous concepts that are

explored in greater depth include equations, inequalities, exponents, functions, graphing, systems of equations, polynomials and radicals. New topics include higher degree equations, complex numbers, and rational expressions. An emphasis is also placed on using variables and the language of Algebra to solve a variety of comprehensive word problems relating to real world experiences.

**Note: Students are encouraged to purchase a TI-83 or TI-84 graphing calculator. Your teacher will inform you as to which calculator to purchase. A graphing calculator will be used extensively in this course. Graphing calculators will be available for use in class.**

### **HONORS ALGEBRA II (4260) 5 credits Grades: 10-11**

Prerequisite:

- a. CP Algebra final grade of "A"
- b. Honors Geometry minimum final grade of "B" **OR** CP Geometry final grade of "A" **OR** teacher recommendation

This course is designed for tenth grade students as the third course of a three-year math requirement. It is for students who are confident in math and are planning to attend college with a math/science focus. This course is designed to extend the skills and concepts developed in Honors Algebra I. Previous concepts that are explored in greater depth include equations, inequalities, exponents, functions, graphing, systems of equations, polynomials and radicals. New topics include higher degree equations, complex numbers, rational expressions, radical expressions, rational exponents and conic sections. Students will study a variety of different functions, including linear, quadratic, and logarithmic functions. Use of the graphing calculator is necessary for discovery, problem solving, and modeling. An emphasis is also placed on using variables and the language of Algebra to solve a variety of comprehensive word problems that are applicable to the world today.

**Note: The course requires the student to be highly skilled in Algebra I material. Students will be given Algebra I review material to be completed during the summer and to be submitted the first day of class. A comprehensive diagnostic test will be administered during the first week of class.**

**Note: Students are encouraged to purchase a TI-83 or TI-84 graphing calculator. Your teacher will inform you as to which calculator to purchase. A graphing calculator will be used extensively in this course. Graphing calculators will be available for use in class**

### **COLLEGE PREP STATISTICS (4270) Elective 5 credits Grades: 11- 12**

Prerequisite: College Prep Algebra II (4250)

This course is designed for the student who wishes to continue to explore a large range of mathematical topics with an emphasis on “real world” applications such as games of chance, random population, and actuarial science. The purpose of this course is to introduce students to the major concepts and tools for collecting, analyzing and drawing conclusions from data, calculating simple theoretical probabilities, identifying the characteristics and applying theoretical probability distributions, and analyzing basic inferential statistics data. The course focuses on descriptive statistics, probability theory, Binomial, Poisson, z, t, and Chi-square distributions, central limit theorem, confidence intervals, and hypothesis testing. Students will regularly apply the tools of technology including the graphing calculator and computer to solve problems. They will be challenged

through critical thinking exercises and participate in various group and individual activities that will enhance their mathematical reasoning ability and communication skills.

**NOTE: Students are encouraged to purchase TI NSpire or TI-84 graphing calculator. Your teacher will inform you as to which calculator to purchase. A graphing calculator will be used extensively in this course. Graphing calculators will be available for use in class.**

### **HONORS STATISTICS (4275) Elective 5 credits Grades: 11- 12**

Prerequisite: Minimum of College Prep Algebra II (4250) with a final grade “B” or higher.

This course is designed for the student who wishes to continue to explore a large range of mathematical topics with an emphasis on “real world” applications such as games of chance, random population, and actuarial science. The purpose of this course is to introduce students to the major concepts and tools for collecting, analyzing and drawing conclusions from data, calculating simple theoretical probabilities, identifying the characteristics and applying theoretical probability distributions, and analyzing basic inferential statistics data. The course focuses on descriptive statistics, probability theory, Binomial, Poisson, z, t, and Chi-square distributions, central limit theorem, confidence intervals, and hypothesis testing. One hour per week is spent in the computer lab exploring software applications of statistical concepts presented in the lecture. Students will regularly apply the tools of technology including the graphing calculator and computer to solve problems. They will be challenged through critical thinking exercises and participate in various group and individual activities that will enhance their mathematical reasoning ability and communication skills.

**NOTE: Students are encouraged to purchase TI NSpire or TI-84 graphing calculator. Your teacher will inform you as to which calculator to purchase. A graphing calculator will be used extensively in this course. Graphing calculators will be available for use in class.**

### **ADVANCED ALGEBRA & TRIGONOMETRY COLLEGE PREP (4240, (4250)) 5 credits Grades: 11-12**

Prerequisite: Algebra II with a minimum final grade of “C”.

This course is designed to expand on the topics covered in Algebra II and provide the prerequisites for Pre-Calculus. Topics covered include basic operations on advanced polynomials, exponents, radicals, conic sections, systems of equations, quadratic equations, rational functions, exponential and logarithmic functions, sequences and series, and basic trigonometry. Topics in this class reflect and support those on the Accuplacer college placement exam. Graphing calculators will be used occasionally in class. **NOTE: Scientific and Graphing calculators will be available for use in class. Students are encouraged to purchase their own calculator in order to work at home. Your teacher will inform you which calculator works best for the class and you.**

### **HONORS PRE-CALCULUS (4610) 5 credits Grades: 11- 12**

Prerequisites:

- a. HONORS Algebra II with a minimum final grade of "B" **OR** College Prep Algebra II final grade "A"
- b. HONORS Geometry with a minimum final grade of "B" **OR** College Prep Geometry final grade "A"

This course is intended for students seeking a rigorous course of study in preparation of a two or four-year college math/science program. This course places an emphasis on mathematical structure, deductive reasoning, and the understanding of a function. There is a firm presentation of Algebraic and Trigonometric concepts. The major focus is to prepare the students in graphical techniques, algebraic and transcendental functions, and analytic geometry.

**Note: The course requires the student to be highly skilled in Algebra II and Geometry material. Students will be given Algebra II and Geometry review material to be completed during the summer and be submitted the first day of class. A comprehensive diagnostic test will be administered during the first week of class.**

**NOTE: Students are encouraged to purchase a graphing calculator. Your teacher will inform you as to which calculator to purchase. A graphing calculator will be used extensively in this course. Graphing calculators will be available for use in class.**

### **ADVANCED PLACEMENT CALCULUS AB (6145) 5 credits Grades: 11-12**

Prerequisites:

Honors Pre-Calculus with a minimum final grade of “B” 80 OR Teacher Recommendation

Calculus Advanced Placement consists of calculus and related topics comparable to at least the first semester of college calculus. A major goal of this course is to prepare students for the high standards of academics and independent study required in college. This course consists of the study of analytic geometry, which encompasses coordinate geometry, the study of lines, functions and graphs. The knowledge and use of trigonometric functions will be incorporated into the concepts of calculus. These concepts include limits, derivatives, maxims, minima, integrals and the applications of these concepts in physics oriented problems. Students may be required to take the Advanced Placement Exam at their own expense to get Advanced Placement Credit. A satisfactory score on this exam may allow a college to grant credit. The AP Exam does not exempt students from the course final exam.

**Note: The course requires the student to be highly skilled in Honors Calculus and Pre-Calculus material. Students will be given Honors Calculus and Pre-Calculus review material to be completed during the summer and be submitted the first day of class. A comprehensive diagnostic test will be administered during the first week of class.**

**Note: Students are encouraged to purchase a graphing calculator. A graphing calculator will be used extensively in this course. Your teacher will inform you as to which calculator to purchase. Graphing calculators will be available for use in class.**

### **CONSUMER MATH (8103) 5 credits Grades: 10-12**

Prerequisite: two years completion of prior mathematics courses; IEP team recommendation

This course is limited to those students who have an **Individual Educational Plan (IEP)** developed with the Child Study Team. Consumer Mathematics reviews the practical uses of mathematics in the consumer/business world. The topics covered reflect mathematics and terminology used by the consumer and in business and industry by accountants, managers, salespeople, etc. Students will use Excel to facilitate the consumer tasks of budgeting and investing money specifically in these areas:

checking account, savings account, money market accounts, bonds, and certificates of deposit (CD's). Furthermore, students will learn the mathematical skills applied to income, transportation, housing, taxes, insurance, and purchasing. The student's individual educational plan will determine the level of instruction and the goals for successful completion.

### **CONSUMER/BUSINESS MATH (4510) 5 credits Grade 11-12**

Prerequisites:

- a. Algebra I
- b. Geometry

This course reviews the practical use of mathematics in the consumer/business world. Emphasis will be placed on consumer applications using problem solving strategies to develop critical thinking skills. This course will help students become effective consumers and will apply their skills to making real world consumer decisions. The topics covered reflect mathematics and terminology used by the consumer and in business and industry by accountants, managers, salespeople, etc. Students will use Excel to facilitate the consumer tasks of budgeting and investing money specifically in these areas: checking account, savings account, money market accounts, bonds, and certificates of deposit (CD's). Furthermore, students will learn the mathematical skills applied to income, transportation, housing, taxes, insurance, and purchasing.

**Note: Scientific calculators will be used throughout the course and will be available for you to use during class time**

### **MATH TEST PREP 12 (4285) 5 credits**

This course is for seniors needing remediation in Mathematics in order to earn a high school diploma. The NJ Department of Education cut score requirements are listed below.

#### **English Language Arts**

PARCC ELA Grade 9  $\geq 750$  (Level 4) *or*  
PARCC ELA Grade 10  $\geq 750$  (Level 4) *or*  
PARCC ELA Grade 11  $\geq 725$  (Level 3) *or*  
SAT Reading\*  $\geq 400$  *or*  
ACT Reading or ACT PLAN Reading  $\geq 16$  *or*  
Accuplacer Write Placer  $\geq 6$  *or*  
PSAT10 Reading or PSAT-NMSQT Reading\*\*  
 $\geq 40$  *or*  
ACT Aspire Reading  $\geq 422$  *or*  
ASVAB-AFQT Composite  $\geq 31$  *or*  
Meet the Criteria of the NJDOE Portfolio Appeal

#### **Mathematics**

PARCC Algebra I  $\geq 750$  (Level 4) *or*  
PARCC Geometry  $\geq 725$  (Level 3) *or*  
PARCC Algebra II  $\geq 725$  (Level 3) *or*  
SAT Math\*  $\geq 400$  *or*  
ACT or ACT PLAN Math  $\geq 16$  *or*  
Accuplacer Elementary Algebra  $\geq 76$  *or*  
PSAT10 Math or PSAT/NMSQT Math\*\*  $\geq 40$  *or*  
  
ACT Aspire Math  $\geq 422$  *or*  
ASVAB-AFQT Composite  $\geq 31$  *or*  
Meet the Criteria of the NJDOE Portfolio Appeal