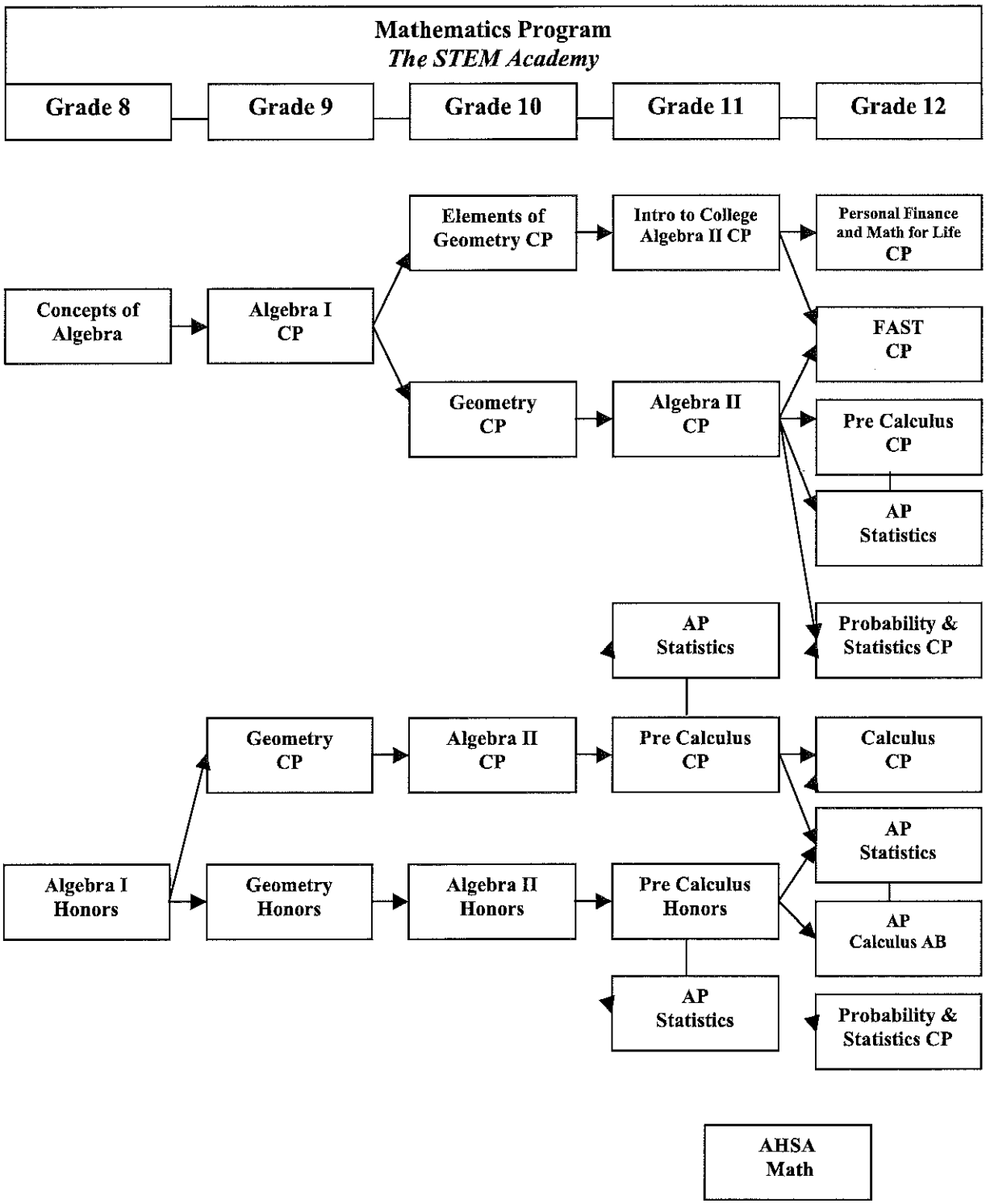
Flow Chart of Courses Offered Through the Mathematics Department



MATHEMATICS

Education With a Purpose

Algebra 1 – College Prep
Prerequisite: Grade 8 Pre Algebra
Full Year **5 credits** **Grade 9**

This course is designed for the grade-level math student. The curriculum provides a sound foundation of algebraic skills and concepts necessary for an understanding of all future mathematics to be studied. Abstract and numerical reasoning is emphasized. Graphing calculators are employed to extend concepts. Students learn a variety of problem solving techniques and will apply arithmetic principles to specific algebraic topics. Students enrolled in this class will be required to take the End-of-Course Algebra I Exam. If proficiency is not met, remediation will be required as per the NJ Department of Education.

Elements of Geometry – College Prep
Prerequisite: Elements of Algebra I
Full Year **5 credits** **Grade 10**

Elements of Geometry is a college preparatory course in the fundamentals of geometry. Emphasis is placed on repetition and experiential learning through a differentiated problem solving approach. Students will develop an understanding of plane and solid geometry through the use of definitions, observations and theorems. This is a hands-on geometry course based on investigation and discovery, problem solving, cooperative learning and challenge. All topics expected in a Euclidean geometry course are covered. Current educational technology is utilized in many investigations, activities and projects. Skills acquired in Algebra I will be further strengthened throughout the course. Problem solving will be emphasized to encourage higher level thinking skills. Standardized test preparation is integrated throughout the course.

Geometry – College Prep
Prerequisite: Algebra I
Full Year **5 credits** **Grade 10**

This college preparatory course emphasizes topics inherent to Euclidean geometry. This is a hands-on geometry course based on investigation and discovery, problem solving, cooperative learning and challenge. Current educational technology is utilized in many investigations, activities and projects. Knowledge of geometry will be developed with an emphasis on its logical structure and problem solving with consideration of both the inductive and deductive methods of reasoning as applied to formal proofs. Skills acquired in Algebra I will be further strengthened throughout the course. Problem solving will be emphasized to encourage higher level thinking skills. Standardized test preparation is integrated throughout the course.

Geometry - Honors
Prerequisite: Honors Algebra I
Full Year **5 credits** **Grade 9**

This rigorous course emphasizes topics inherent to Euclidean and solid geometry. Knowledge of geometry will be developed with an emphasis on its logical structure, using critical thinking skills and problem solving strategies with consideration of both the inductive and deductive methods of reasoning as applied to formal proofs. Problem solving will be emphasized to encourage higher level thinking skills. Standardized test preparation is integrated throughout the course.

MATHEMATICS

Education With a Purpose

Introduction to College Algebra – College Prep
Prerequisite: Elements of Geometry
Full Year **5 credits** **Grade 11**

This course involves the application and further development of the fundamentals of Algebra I CP and basic concepts of Algebra 2. Knowledge is expanded through the use of problem solving and critical thinking applications. It presents a unified treatment of algebra and analytical geometry that exhibits the logical structure of mathematics. It includes those topics essential for further study of mathematics. The graphing calculator is integrated into the curriculum to model real world problems. Closely aligned with The Core Curriculum Standards in Mathematics, Standardized test preparation is integrated throughout the course to better prepare the student for the HSPA, SAT and ACT tests.

Algebra II – College Prep
Prerequisite: Geometry
Full Year **5 credits** **Grade 11**

This course is designed for the strong grade-level mathematics student. Course objectives are to solidify concepts of Algebra I CP through review, extension and application problem solving. It presents a unified treatment of algebra and analytical geometry that exhibits the logical structure of mathematics. Topics include: linear and quadratic equations, functions, systems of equations and inequalities, matrices, polynomial functions, rational functions, radical equations, probability, and introduction to conic sections and to exponential and logarithmic functions, The graphing enhanced curriculum allows for modeling of real world problems. Standardized test preparation is integrated throughout the course.

Algebra II - Honors
Prerequisite: Honors Geometry
Full Year **5 credits** **Grade 10**

This is a rigorous course designed for the advanced mathematics student. It will provide the student with in-depth instruction at an accelerated pace. This course involves a comprehensive study of mathematics in preparation for Pre-calculus H. Topics include: linear and quadratic equations, functions, systems of equations and inequalities, matrices, polynomial functions, rational functions, radical equations, exponential and logarithmic functions, probability, conic sections, and trigonometry. The graphing enhanced curriculum allows for modeling of real world problems. Standardized test preparation is integrated throughout the course.

Pre-Calculus - Honors
Prerequisite: Honors Algebra II
Full Year **5 credits** **Grade 11**

This rigorous math course will provide the students with a comprehensive study of mathematics in preparation for a course in Advanced Placement Calculus. The Pre-calculus Honors course consists of the following topics: extensions of algebra, limits, continuity, derivatives, implicit differentiation, exponential and logarithmic functions, derivatives of exponential and logarithmic functions, trigonometric functions and their inverses, analytic trigonometry, derivatives of trigonometric functions and their inverses, additional topics in trigonometry, parametric equations, and polar equations. Students will use graphing calculators extensively in this course.

MATHEMATICS

Education With a Purpose

Personal Finance and Life Mathematics – College Prep
Prerequisite: Introduction to College Algebra
Full Year **5 credits** **Grade 12**

This course is designed to investigate the uses of mathematics in students' everyday lives as well as in certain phases of business and finance. In addition to limited career exploration, topics of study include: consumerism, banking, home-buying, investing, insurance, and basic economics. The emphasis in general is on practical mathematical applications and the role of financial institutions in the "real" world. Basic statistics are applied to the study of mathematics in business and finance. **This fourth year math course fulfills the Personal Financial Literacy Requirement.**

Probability and Statistics – College Prep
Prerequisite: Algebra II or Introduction to College Algebra with Teacher Recommedation
Full Year **5 credits** **Grade 12**

Probability provides concepts and methods for dealing with uncertainty and for interpreting predictions based on uncertainty. Probabilistic measures are used to make marketing, research, business, entertainment and defense decisions. The study of statistics should provide an understanding of which measures are appropriate for a given problem and what such measures as mean, variance and correlation can tell them about a problem. The study of probability should provide students with a basis of understanding from which to make informed observations about the likelihood of events, and to interpret and judge the validity of statistical claims.

Functions, Algebra, Statistics and Trigonometry (F.A.S.T) – College Prep
Prerequisite: Algebra II or Introduction to College Algebra with Teacher Recommedation
Full Year **5 credits** **Grade 12**

The Functions, Algebra, Statistics and Trigonometry course was developed specifically for students who need an extra year of mathematics to reinforce and extend their algebraic skills prior to taking pre-calculus. This course will cover functions in depth including: transcendental and non-transcendental, complex and trigonometric. Statistical methods through data analysis will also be investigated and interpreted.

Pre-Calculus – College Prep
Prerequisite: Algebra II
Full Year **5 credits** **Grade 11-12**

Pre-calculus CP is a college preparatory course that introduces aspects of higher mathematics. It is a rigorous course that extends students' Algebra II CPA and basic trigonometry knowledge. Pre-calculus is a study of mathematical theory and applications designed to prepare students for Calculus and higher mathematics. The Pre-calculus CPA course consists of the following topics: extensions of algebra; trigonometric functions and their inverses; analytic trigonometry; and functions, matrix algebra, exponential and logarithmic functions, polynomial functions, and rational functions. Students will use graphing calculators extensively in this course.

MATHEMATICS

Education With a Purpose

AP Statistics

Prerequisite: Grade of A in Algebra II or a grade of B or better in Algebra II Honors and / or teacher recommendation

Full Year **5 credits** **Grade 11-12**

The aim of this AP course is to provide students with a learning experience equivalent to that obtained in most introductory college statistics courses, which have become a requirement for many college majors. The course involves four major topics: exploring data, planning a study, anticipating patterns, and statistical inference. In addition to mastering skills and understanding concepts, each student will develop an awareness of the importance of this subject in the real world, improve communication skills to convey decisions and ideas, and apply this knowledge in the future. AP Statistics is available to students who have successfully completed Algebra 2. It may be taken concurrently with Pre Calculus (CP or Honors) or Calculus (CP or AP).

Calculus – College Prep

Prerequisite: Grade of B or better in Pre-Calculus

Full Year **5 credits** **Grade 12**

This course introduces the student to calculus of a single variable. The course is problem-driven in response to the calculus reform movement and integrates applications to management, life, and social science in exercises throughout the course. Functions are presented graphically, numerically, and algebraically to give students the benefit of alternate interpretations. The graphing calculators are used extensively.

Advanced Placement Calculus AB

Prerequisite: "B" in Honors Pre-Calculus or Teacher Recommendation

Full Year **5 credits** **Grade 12**

This is a college level course in calculus taught at an accelerated pace in preparation for the AP Examination in AB Calculus. At the completion of the course, the student will understand the theory and applications of differential and integral calculus. It is expected that students who successfully complete the course will have developed proficiency in the following areas: evaluate limits, derivatives, and integrals, apply derivatives to related rates, optimization problems, and velocity, apply integrals to area, volume, and differential equations, and become proficient in the use of a graphing calculator. Students in the AP Calculus AB course are expected to make a commitment to taking the AP Calculus AB Examination administered by the CollegeBoard.

HSPA/AHSA Mathematics

Prerequisite: Placement

Full Year **0 credits** **Grade 12**

Students in grade 12 who earned a score of partially proficient on the math section of the 11th grade HSPA are automatically placed in this AHSA (Alternate High School Assessment) program for supplemental support and testing. This placement is mandated by the New Jersey Department of Education which requires proficient scores on the HSPA to be eligible for a High School diploma. These twelfth grade students remain in the course until they pass the section previously determined partially proficient, or until they pass the AHSA process set forth by New Jersey Department of Education guidelines. This course may not be used to satisfy any of the required math credits for graduation. The grading for AHSA math is Pass/Fail and is not included in GPA calculations.