COURSE DESCRIPTIONS - MATHEMATICS

APPLIED ALGEBRA I - 0521

Grades 9
(1 credit)

Purpose: This course is intended for 9th graders who would learn better from a hands-on approach and for 10th graders in the sequence of Applied Mathematics courses.

Description: This course is an interactive, workplace-centered approach to basic algebra concepts. It is ideal for students who are conceptual learners. Applied Algebra teaches abstract concepts through concrete applications using the workplace as the platform for learning. Hands-on math labs give students the opportunity to experience concepts while making math practical and relevant. Students will be engaged in cooperation teams, working on projects and activities that help to make math more memorable and algebra more accessible to all students with different abilities or learning styles.

Requirements: The students will be responsible for hands-on labs, problem solving activities, projects, tests, daily class work and homework. Calculators are required. TI30X is recommended.

Prerequisites: Recommendation of previous mathematics teacher or scoring not proficient on 8th grade PSSA.

APPLIED ALGEBRA II – 0518

Grades 10
(1 credit)

Purpose: This course is intended as a second course in algebra, following Applied Algebra I or Applied Geometry for the applied mathematics student.

Course Description: The algebraic concepts covered include: properties of real m\numbers, solving and graphing linear equations and inequalities, solving systems of equations and inequalities, exponents, quadratic equations, factoring polynomials, rational expressions, radicals.

Requirements: Students will be responsible for daily homework assignments and class activities, quizzes, tests, final exam. Each student MUST provide a calculator for use each day in class. TI30X is recommended.

Prerequisites: Successful completion of Applied Algebra I or approval from the math department for any student who has greater than 77% in Algebra I.

APPLIED GEOMETRY - 0522

Grade 11
(1 credit)

Purpose: This course is intended for sophomores or juniors in the sequence of Applied Mathematics courses.

Course Description: This course is an interactive, workplace-centered approach to geometry concepts designed for students who are conceptual learners. Through hands-on math labs and class activities, students have the opportunity to experience math concepts using applications to the real world. The course includes the geometry concepts of reasoning and proof, parallel lines, congruent and similar triangles, quadrilaterals, coordinate geometry, area, circles, surface area, volume and transformational geometry.

Requirements: The students will be responsible for hands-on labs, problem solving activities, projects, tests, daily class work and homework.

Prerequisite: Successful completion of Applied Algebra II.

APPLIED MATH TOPICS- 0508 ***Grades 12***
(1 credit)

Purpose: This course is designed to help students use and apply mathematics in real life situations and to meet proficiency on state assessment.

Course Description: The course is devoted to discussing consumer affairs and solving related problems. The course covers the following topics: making consumer decisions, the cost of transportation, computing taxes, determining consumer credit, banking services, insurance costs and investments. Also remediation of the math PSSA standards.

Requirements: Students will be responsible for daily homework assignments and class activities, quizzes, tests, and final exam.

✳**Prerequisites:** Successful completion of Applied Geometry and Applied Algebra II or not proficient on the 11^{th} grade math PSSA.

ALGEBRA I - 0509 ***Grades 9, 10, 11, 12***
(1 credit)

Purpose: Algebra I is designed as the first formally structured course of the academic sequence for the college-bound student.

Course Description: Topics that are developed within the course include solving equations, inequalities, and word problems, polynomial operations, factoring, relations, functions, graphing, systems of equations, algebraic fractions, powers, roots and quadratic equations.

Requirements: Students will be responsible for daily homework assignments and class activities, quizzes, tests, final exam. Students must provide their own calculator. A TI 30x or above is recommended.

Prerequisites: At least an 85% in 8th grade math and recommendation of teacher or completion of Applied Algebra I with <u>at least 93%.</u>

ALGEBRA II – 0510 ***Grades 9, 10, 11, 12***
(1 credit)

Purpose: This course is designed as an extension of the concepts learned in Algebra I to provide a sound foundation of algebra for college bound students.

Course Description: Topics studied include negative exponents, inequalities, complex numbers, radicals, variation, quadratic functions, graphs of quadratic functions, logarithms and other advanced topics.

Requirements: Students will be responsible for daily homework assignments and class

activities, quizzes, tests, projects, and final exam. [Students must provide their own calculators. TI30X is recommended]

Prerequisites: At least 77% in Algebra I. (Freshmen scheduling Algebra II must have received at least a 90% in Algebra I in 8th grade).

GEOMETRY - 0512 ***Grades 9, 10, 11, 12***
(1 credit)

Purpose: Geometry is designed to help the student develop deductive and inductive reasoning as applied to the study of plane and solid geometry.

Course Description: The student is introduced to basic geometry concepts of segments, angles, triangles, and quadrilaterals. Deductive reasoning in the traditional sense will be used in 2 column and paragraph proofs. Great detail is given to circles, Pythagorean theorem, special triangles, surface area and volume of solids. Concepts of similarity and measurement of plane figures are also covered.

Requirements: Students will be responsible for daily homework assignments and class activities, quizzes, tests, and final exam.

✳**Prerequisites:** Successful completion of Algebra I with at least a 77%.

TRIGONOMETRY -0513 ***Grades 11, 12***
(1 credit)

Purpose: This course is designed to extend the student's fundamental mathematical skills so that he/she may enjoy topics in other advanced mathematical and scientific disciplines.

Course Description: The course is a study of a comprehensive analysis of the circular and trigonometry functions, distance and area, circles and angles, graphs of circular functions, solutions of triangles, identities, inverses, vectors, complex numbers, exponential and logarithmic functions, sequences and series, probability, polynomial functions and limits.

Requirements: Students will be responsible for daily homework assignments and class activities, quizzes, tests, and final exam. Calculators will be required. (If students are planning to take calculus, they may want to purchase a TI83plus calculator to use with this course.)

Prerequisites: Successful completion of Algebra I, Algebra II, and Geometry.

CALCULUS - 0520 ***Grade 12***
(1 credit)

Purpose: Calculus is the mathematics of motion and change. Calculus and its extensions in mathematical analysis are far reaching; as can be seen by the plethora of problems it solves and the wide range of fields that use it in mathematical models that bring understanding about the universe and the world around us. Our goals include: learning calculus and seeing how it is being used in our world, appreciating it for the great discovery that it is, and preparing the students for further study of math in college. This is not the course to take if you plan to do the AP Test.

Course Description: Algebra, geometry, and trigonometry topics all meet in what is called

calculus. We will attempt to bring calculus to life in this course through real-life examples, projects, kinesthetic activities, history, and discussions. Note-taking, homework, tests, and quizzes are also a major component in order for the student to grasp the topics. We will learn to use the TI-83 calculator to analyze some topics.

Requirements: The student will be responsible for daily homework assignments and class activities, projects, quizzes, tests, etc. In addition, a GRAPHIC CALCULATOR IS NEEDED. Recommended models include TI-82, TI-83, TI-83PLUS (the best choice at present), TI-89.

Prerequisites: Successful completion of trigonometry.

ADVANCED PLACEMENT CALCULUS I – 0511 **Grade 12**
(1 credit)

Purpose: This course will provide the student with beginning knowledge of advanced math principles in preparation for post secondary study in the fields of engineering, physical sciences, architecture, business, and related technical fields. This course is an in-depth study of calculus for students intending to take AP Calculus test second semester.

Course Description: The course will begin with a renewed foundation in pre-calculus. Elementary functions, domain/range, the combination of functions through addition, subtraction, multiplication, division, and composition will initially be addressed. Polynomial, rational, root, piecewise, and trig-functions will be the first types of functions studies. Analysis of graphs, limits, asymptotic and unbounded behavior, continuity, derivation theory and application will be examined from both analytical and graphical points of view. If time permits, the anti-derivative will be introduced.

Requirements: The student will be responsible for daily homework assignments and class activities, projects, quizzes, tests, etc. In addition, a **GRAPHIC CALCULATOR IS NEEDED.** Recommended models include TI-82, TI-83PLUS, TI84, and TI-89.

Prerequisites: Successful completion of trigonometry.

A.P. CALCULUS II - 0514 ***Grade 12***
(1 credit)

Purpose: This course will provide the student the opportunity to prepare for the AP Calculus AB exam given in MAY.

Course Description: This course is a continuation of the AP Calculus I course. Interpretations and properties of the integral will be studied. The differential and linear approximations, Riemann sums, trapezoidal sums, the Fundamental Theorems of Calculus, techniques of antidifferentialtion such as substitution of variables, applications that involve area, volume, motion, economic situations, exponential growth and average value of a function, and slope fields will be covered. Time will be set aside for practicing AP Calculus tests from the past. Afterwards, some Calculus BC items such as integration by parts and partial fractions, L'Hopital's Rule would be addressed.

Requirements: The student will be responsible for daily homework assignments and class activities, projects, quizzes, tests, etc. In addition, a **GRAPHIC CALCULATOR IS NEEDED**. Recommended models include TI-82, TI-83, TI-83PLUS, TI84, TI-89.

Prerequisites: Successful completion of AP Calculus I.

COLLEGE MATH - 0519 ***Grade 12***
(1 credit)

Purpose: This course is designed for college bound students.

Course Description: This course covers a wide range of topics in algebra, probability, statistics, functions, sequences and series, set theory and math reasoning. The topics covered are needed for college mathematics and enhance the student's present knowledge of algebra and geometry.

Prerequisites: Successful completion of Algebra I and II and Geometry. Students must provide their own calculator.

Requirements: The student will be responsible for daily homework assignments, class activities, quizzes, tests, projects, and final exam.

STATISTICS - 0523 ***Grade 11, 12***
(1 credit)

Purpose: Statistics influences nearly all facets of our society. Decisions in government, education, business, sports, politics, and many other fields are often based on statistical considerations. Our future as a society may depend in large measure on our ability to evaluate information, determine truth, and make meaningful decisions. This course will provide the opportunity for students to practice using the methods of statistics and to see how it relates to their lives.

Course Description: Statistics is the branch of mathematics that deals with the collection, analysis, and implications of numbers that reflect measurable events. Descriptive statistics handles the collection and presentation of data. Inferential statistics is concerned with properly analyzing and drawing conclusions from numerical information.

Requirements: Students will be required to demonstrate working knowledge of how, and with what methods, to analyze data. They will be required to use their results to make correct decisions and predictions about population characteristics. In addition, students will be required to show a proficiency using MINITAB statistical software. Written tests, computer performance tests, cooperative assignments, homework, projects, and presentations will be used to evaluate students on the above listed knowledge. **GRAPHIC CALCULATOR IS NEEDED**. Recommended models include TI-83 and TI-83PLUS.

Prerequisites: Successful completion of Algebra II and Geometry

AP STATISTICS - 0524 ***Grade 11, 12***
(1 credit)

Purpose: Statistics influences nearly all facets of our society. Decisions in government, education, business, sports, politics, and many other fields are often based on statistical considerations. Our future as a society may depend in large measure on our ability to evaluate information, determine truth, and make meaningful decisions. This course will provide the opportunity for students to practice using the methods of statistics and to see how it relates to their lives. Students planning to take science and/or mathematics courses in college will benefit greatly from taking AP Statistics.

Course Description:
Students are exposed to four broad conceptual themes:

1. Exploring Data: Observing patterns and departures from patterns.
2. Planning a Study: Deciding what and how to measure.
3. Anticipating Patterns: Producing models using probability theory and simulation.
4. Statistical Inference: Confirming models.

Requirements: Prepare for and take the AP Statistics exam in May. Students will be required to demonstrate working knowledge of how, and with what methods, to analyze data. They will be required to use their results to make correct decisions and predictions about population characteristics. In addition, students will be required to show a proficiency using Microsoft Excel and MINITAB statistical software. Written test, computer performance tests, cooperative assignments, homework, projects and presentations will be used to evaluate students on the above listed knowledge. **GRAPHIC CALCULATOR IS NEEDED**. Recommended models include the TI-83 and the TI-83PLUS.

Prerequisites: Successful completion of Trigonometry.

COMPUTER PROGRAMMING I (QBASIC)- 0515 ***Grades 9, 10, 11, 12***
(1 credit)

Purpose: This course will enable students to solve interesting programming problems on the computer using QBASIC computer language.

Course Description: The course will cover a variety of programming problems. The programs are designed to encourage and enable the student to write user friendly programs. All of the programming skills that a student will need are developed step by step in a problem-solving approach. Students are encouraged to use flowcharts for planning, module blocks for structure and documentation for ease of understanding.

Requirements: The student will be required to independently write and successfully run on the computer, a group of programs relating to each of the areas covered. Tests and quizzes will be given periodically.

Prerequisites: Successful completion of Algebra I.