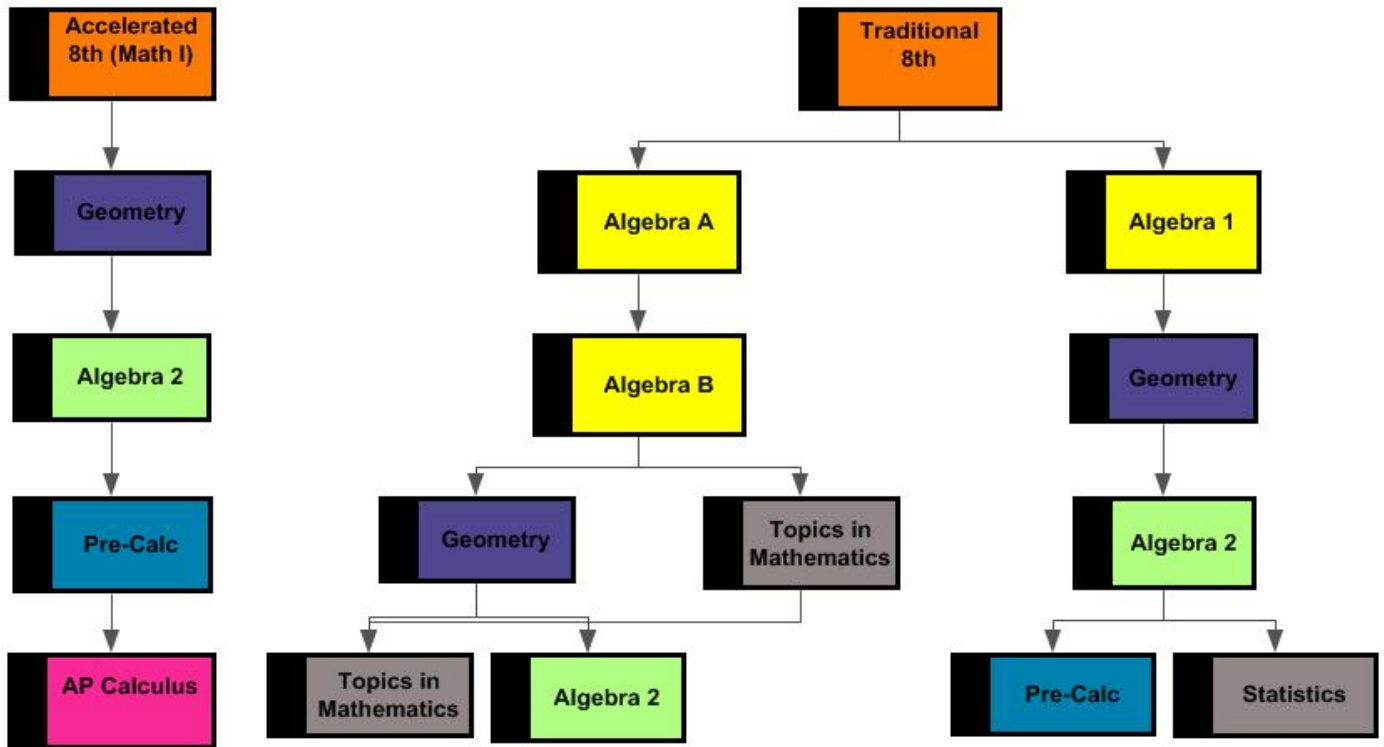


MATHEMATICS



*Statistics is a one semester course. Students may take statistics after one semester of Algebra 2, provided they earn a "C" or better.

MATHEMATICS

ALGEBRA 1: - Full Year Course

Course #: 2031 – 2032

Credit: 2

Elective: Grades 9 – 12

Prerequisite: None

Course Description:

This course in Algebra uses variables to represent numbers which makes it easier to study number patterns and solve problems. The logical thinking and problem-solving skills gained are important in everyday life as well as in most careers.

Skills Needed To Be Successful In The Class:

Students must be competent in basic math skills: addition, subtraction, multiplication and division of whole numbers, fractions, and decimals.

Specific Outcomes – The Student Will Be Expected To:

1. Understand language of Algebra.
2. Appreciate the need for precision of language.
3. Recognize how and where Algebra is used in everyday living.
4. Classify real numbers.
5. Solve linear equations.
6. Graph relations and functions.
7. Analyze linear equations.
8. Solve linear inequalities
9. Solve systems of linear equations and inequalities.
10. Classify and perform operations on polynomials.
11. Factor polynomials.
12. Solve quadratic equations.
13. Solve right triangles.
14. Simplify radical expressions.

Careers Related to Content:

Business, Education, Medicine, Engineering, etc.

MATHEMATICS

ALGEBRA A/B: 2 Full Year Courses

Course #: 2053, 2054
Credit: 4
Elective: Grades 9 – 12
Prerequisite: None

Course Description:

This course in Algebra uses variables to represent numbers which makes it easier to study number patterns and solve problems. The logical thinking and problem-solving skills gained are important in everyday life as well as in most careers. The content is divided up into 2 years of mathematics, accounting for a variety of learner needs.

Skills Needed To Be Successful In The Class:

Students must be competent in basic math skills: addition, subtraction, multiplication and division of whole numbers, fractions, and decimals.

Specific Outcomes – The Student Will Be Expected To:

1. Understand language of Algebra.
2. Appreciate the need for precision of language.
3. Recognize how and where Algebra is used in everyday living.
4. Classify real numbers.
5. Solve linear equations.
6. Graph relations and functions.
7. Analyze linear equations.
8. Solve linear inequalities
9. Solve systems of linear equations and inequalities.
10. Classify and perform operations on polynomials.
11. Factor polynomials.
12. Solve quadratic equations.
13. Solve right triangles.
14. Simplify radical expressions.

Careers Related to Content:

Business, Education, Medicine, Engineering, etc.

MATHEMATICS

GEOMETRY: - Full Year Course

Course #: 2041 – 2042

Credit: 2

Elective: Grades 9 - 12

Prerequisite: Completion of Algebra I: Algebra 1 (9th grades entering geometry must have fulfilled the 8th grade Algebra 1 contract to be able to take this course in 9th grade: earn a B in 2nd semester 8th Algebra I.)

Course Description:

Geometry is the study of deductive and inductive reasoning utilizing points, lines, and planes. The logical thinking and problem-solving skills gathered are important in everyday life as well as in most careers.

Skills Needed To Be Successful In The Class:

Students must be able to use algebraic skills in transforming and solving equations. They should be able to use and simplify all real numbers involved in mathematical operations.

Specific Outcomes -- The Student Will Be Expected To:

1. Use geometric tools.
2. Understand the language of Geometry.
3. Understand and complete two-column proof.
4. Understand elementary laws of logic.
5. Discover and apply the angle relationships between parallel and perpendicular lines.
6. Solve right triangles.
7. Classify polygons.
8. Solve problems using relationships between angles and line segments involved with circles.
9. Use perimeter, circumference, and area formulas for polygons and circles.
10. Compute surface area and volume of familiar solids.

Careers Related to Content:

Education, Drafting, Architecture, Engineering, Construction, Graphic Design, Geology, Computer Software Design, Cartography, Accounting

MATHEMATICS

ALGEBRA 2: - Full Year Course

Course #: 2061 – 2062

Credit: 2

Elective: Grades 10 - 12

Prerequisite: Successful completion of Algebra 1 and Geometry

Course Description:

Algebra 2 is a continuation of Algebra 1 and is needed by college-bound students. It is the study of the real number system and provides applications that connect the content to common situations. Students also experience different problem-solving techniques and refine problem solving skills.

Skills Needed To Be Successful In The Class:

Students should understand the use of variables, operations with signed numbers, order of operations, solving equations in one variable, using exponents to simplify expressions, factoring, solving verbal problems and evaluating arithmetic and algebraic expressions. Students **must** have a scientific calculator. Graphing calculators are optional, but strongly encouraged for those intending on taking Pre-Calculus after this course. Students should also be able to do 'mental arithmetic'.

Specific Outcomes -- The Student Will Be Expected To:

1. Solve and graph linear equations and inequalities.
2. Solve systems of equations and inequalities in two or three variables.
3. Perform operations with matrices.
4. Perform operations with complex and irrational numbers and polynomials.
5. Solve quadratic equations using a variety of methods, and graph them.
6. Distinguish between conic sections and graph them.
7. Find factors, zeros, and graphs of polynomials.
8. Simplify rational expressions and solve rational equations.
9. Solve problems using trigonometry.
10. Solve problems using geometric and arithmetic sequences and series.
11. Use statistics and probability to compare, count and classify data.
12. Perform operations with exponential and logarithmic functions.

Careers Related to Content:

Science, Engineering, Business, Computer Science, Education, Medicine, Computer Graphics, Accounting, Actuarial Science, Mathematics.

MATHEMATICS

PRE-CALCULUS: - Full Year Course

Credit: 2

Course #: 2071 – 2072

Elective: Grades 11 - 12

Prerequisite: Grade of C or better in Algebra 2 or consent of instructor

Course Description:

Pre-Calculus is a course in which emphasis is placed on trigonometry, advanced algebra, analytic geometry, functions and combinations of these topics. In Pre-Calculus, the student will spend time studying functions, theory of equations, nature of graphs, trigonometric functions, trigonometric identities and equations, graphs and inverses of the trigonometric functions, application of trigonometry, exponential and logarithmic functions, matrices, vectors, polar coordinates, complex numbers, conics.

Skills Needed To Be Successful In The Class:

Students must be able to solve equations, solve linear equations, solve systems of equations, solve quadratic equations, graph functions, understand conic sections, work with exponents and exponential functions, write equations, find asymptotes, evaluate and solve trigonometric functions. Graphing calculators are required.

Specific Outcomes -- The Student Will Be Expected To:

Answer questions regarding linear relations and functions, matrices and determinants, theory of equations, nature of graphs, trigonometric equation and graphs and applications, complex numbers, conics, polar coordinates, sequences & series, probability & statistics.

Careers Related to Content:

Education, Accounting, Engineering, Architecture, Medicine, Technology, Computer, Mathematics, Actuary Science.

MATHEMATICS

AP CALCULUS: - Full Year Course

Credit: 2

Course #: 2081 – 2082

Elective: Grade 12

Prerequisite: Grade of B or better in Pre-Calculus or consent of instructor

Course Description:

Calculus is the study of: algebraic, trigonometric, and logarithmic functions; the introduction to and development of limits and their properties; the derivatives of algebraic, trigonometric, and logarithmic functions and the applications to maximum and minimum values of the functions; the introduction to and development of the basic integration formulas and rules for the algebraic, trigonometric, and logarithmic functions. Students will be required to take the Advanced Placement Calculus Exam.

Skills Needed To Be Successful In The Class:

Students must be skilled in algebraic and trigonometric manipulations and techniques. Graphing calculators are required.

Specific Outcomes -- The Student Will Be Expected To:

1. When studying the algebraic, trigonometric, and logarithmic functions:
 - a. Sketch their graphs.
 - b. Find the limit or limit at infinity of the functions.
 - c. Determine if they are continuous and differentiable on an interval.
 - d. Develop the derivative formulas and determine derivatives of the functions.
 - e. Find the integrations of the functions.
2. Find average, instantaneous, and related rates of change, and apply these to linear motion problems
3. Apply the concept of derivatives to find critical values, maximum and minimum of functions, and business and inflection points and concavity.
4. Find the area of a plane region.
5. Apply the Fundamental Theorem of Calculus.
6. Be able to show representations graphically, numerically, symbolically, and verbally.
7. Apply the concept of integrals to areas, volumes, and linear motion.

Careers Related to Content:

Education, Mathematics, Engineering, Science, Business, Medicine and Actuary Science.

MATHEMATICS

Topics in Math I - Semester Course
Topics in Math II - Semester Course

Note: Topics in Math I does NOT have to be taken prior to Topics in Math II

Course #: 2051 - 2052
Credit: 1 per course
Elective: Grades 11-12
Prerequisite: 2 years of math and instructor consent

Course Description:

These courses offer a unique approach for the exploration of topics that are not usually covered in other math courses. The topics are relevant and engaging and include 21st Century math skills. Topics covered include: data analysis, statistics, algebra, and geometry, evolution of mathematics, consumer mathematics and numbers/operations. This course does not satisfy math requirements for 4-year colleges.

Skills Needed To Be Successful in the Class:

Students need to be able to use a scientific calculator and be competent in reading and basic math skills. Students must be able to work alone and in groups.

Specific Outcomes -- The Student Will Be Expected To:

- 1) Apply basic math skills to real world applications
- 2) Create and interpret graphs
- 3) Recognize connections between math class and life as a consumer.
- 4) Communicate mathematically in verbal and written form
- 5) Understand units of measurement
- 6) Understand and use mathematical terminology
- 7) Use the Internet to research mathematical topics
- 8) Work independently and in a group

Careers Related to Content:

Since all careers involve some aspect of mathematics, these courses will be applicable to all careers.

MATHEMATICS

STATISTICS: - One Semester Course

Course #: 2063

Credit: 1

Elective: Grades 11 – 12

Prerequisite: One semester of Algebra 2 with a C or better

Course Description:

This course is intended to be only an introduction to statistics. Vocabulary to be learned includes not only mean, median, and mode, but also normal distribution, stem and leaf, prediction equations, probability, binomial expansion, box and whisker plots, variance, and standard deviation. The hand calculator will be an extremely useful tool in the statistics classroom; as well, the computer is an important component of the contemporary statistics laboratory.

Skills Needed to be Successful in the Class:

Students must be skilled in algebra manipulation, fractions, and percent. They should be familiar with the basic operations of the “scientific calculator” or the “graphing calculator.” The students should understand the basics of probability such as counting of permutations and combinations.

Specific Outcomes – The Student will be expected to:

Read data in different forms as text, numbers, and graphs and develop these descriptions from one set to the next. Use expected values to predict eventual outcomes from “textbook data” and local practical data from the community. Learn to enhance statistic skills with the use of calculators and computers.

Careers Related to Content:

Accounting, Actuary Science, Quality Control Processing, Marketing, Research, Business Analysis, Education, Psychology and Social Science.

MATHEMATICS

BASIC MATHEMATICS: - Full Year Course

Course #: 2841 – 2842

Credit: 2

Required: Grades 9 - 10

Course Description:

Basic math is designed to help develop the math skills students need to succeed as well as to survive. Students will learn about adding, subtracting, multiplying, and dividing whole numbers. They will also learn about fractions, decimals, percentages, different systems of measurement, and other basics of mathematics. This will give them a solid understanding of basic math which will help them to make good decisions all their lives--at school, at home, and on the job.

Skills Needed To Be Successful In The Class:

Students need to know basic facts, be able to compute basic math problems, and use a calculator.

Specific Outcomes:--The student will be expected to:

1. Know basic facts and work basic addition, subtraction, multiplication, and division problems.
2. Figure basic measurements.
3. Solve basic word problems.
4. Compute basic money problems.
5. Recognize place value
6. Round and estimate numbers
7. Changing fractions (improper, proper, mixed, inverting) to equal fractions, know parts of fractions-ratio, graphs and vocabulary.
8. Understanding decimals and percentages