

# MATHEMATICS

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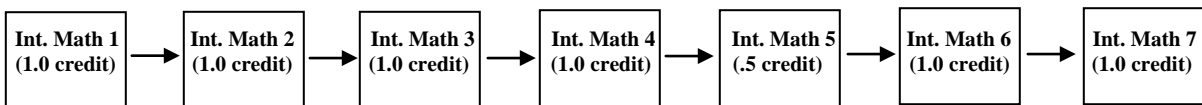
## COURSE SELECTIONS SEQUENCES

- Students are required to complete four (4) credits of Mathematics.
- Students are required to complete coursework equivalent to Algebra 1, Geometry, and Algebra 2. (See below for program specific courses)
- During their senior year, students are required to pass one math-related course.

### College Program with Integrated Approach

To meet state graduation requirements, students must complete at least Integrated Math 1 through 4.

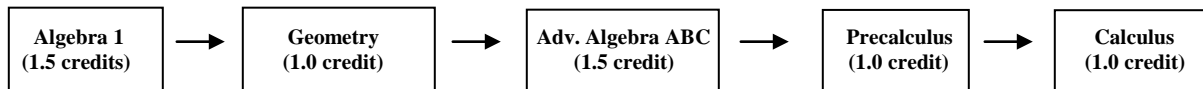
Prior to the junior MME, students using the Integrated approach should complete the sequence of courses through the first half of Integrated Math 3 and Introductory Statistics.



### College Program with Traditional Approach

To meet state graduation requirements, students must complete at least Algebra 1, Geometry and Advanced Algebra (A, B, & C).

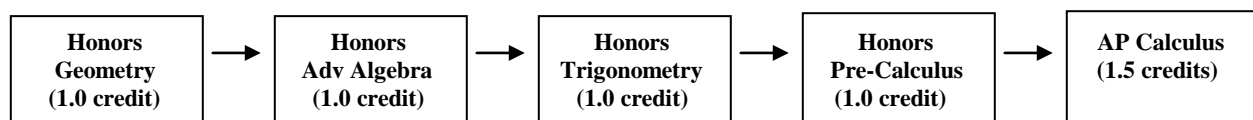
Prior to the junior MME, students using the Traditional approach should complete the sequence of courses through Advanced Algebra C, and either AP Statistics or Introductory Statistics.



### Honors Program

To meet state graduation requirements, students must complete at least Algebra 1, Honors Geometry, and Honors Advanced Algebra.

Prior to the junior MME, students in the Honors Program should complete at least the first half of Honors Pre-Calculus and either AP Statistics or Introductory Statistics.



## **ADVANCED ALGEBRA**

**1.5 credits, grades 9-12**

**Prerequisite: Algebra 1.** Advanced Algebra is a course designed to build upon the concepts taught in Algebra 1. This course will continue the study of exponential and logarithmic functions and will expand to cover rational and trigonometric functions. Students will extend their knowledge to include conic sections, sequences, and iterations.

## **ADVANCED PROBLEM SOLVING**

**0.5 credit, grades 11-12**

**Prerequisite: Advanced Algebra or Integrated Math 3.** The course is designed to provide students with instruction to improve problem-solving ability and demonstrate the uses of mathematics in solving real-world problems. Topics covered include: determining accuracy and error, modeling real-world situations and drawing conclusions, applying probability concepts to practical situations, using linear programming to represent and solve authentic problems, and using mathematics to make decisions involving multiple criteria. The course will include many connections to a field of engineering known as Operations Research, the scientific approach to analyzing problems and making decisions.

## **ALGEBRA 1**

**1.5 credits, grades 9-12**

**Prerequisite: 8<sup>th</sup> grade Concepts in Algebra or teacher recommendation.** Algebra 1 is a course designed for the college bound student and builds upon topics covered in the middle grades. This course thoroughly investigates the structures, techniques, and applications used in basic algebraic reasoning. Algebra 1 will further the study of linear functions and include piecewise and absolute value functions. In addition, students will cover non-linear functions such as quadratic, exponential, logarithmic and power functions. Additional topics will include polynomials, recursive functions, and linear regressions.

## **AP CALCULUS**

**1.5 credit, grades 11- 12**

**Prerequisite: Honors Pre-Calculus or teacher recommendation.** This course is designed for students who plan to continue the advanced math series. Calculus is a comprehensive study of analytical geometry, limits and limit theory, and differentiation and integration of functions of one real variable. Considerable emphasis will be placed upon problem solving.

## **AP STATISTICS**

**1.5 credits, grades 10-12**

**Prerequisite: Honors Advanced Algebra or Geometry.** The purpose of the AP course in statistics is to introduce students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Students are exposed to four broad conceptual themes: exploring data, sampling and experimentation, anticipating patterns, and statistical inference.

## **CALCULUS**

**1.0 credit, grades 11-12**

**Prerequisite: Pre-Calculus.** This course is designed for students who plan to continue the college math series. Calculus is a comprehensive study of analytical geometry, limits, and differentiation and integration of functions of one real variable. Considerable emphasis will be placed upon problem solving.

## **GEOMETRY**

**1.0 credit, grades 9-12**

**Prerequisite: Algebra 1.** This course is a study of plane, solid and coordinate geometry and an introduction to trigonometry. Topics will include angles, lines, area, perimeter, and properties of polygons (focusing on triangles and quadrilaterals). Also included are transformations, a study of circles and their characteristics, and a study of solid figures including surface area and volume. Mathematical reasoning, logic, constructions, and real world connections will be emphasized.

## **HONORS ADVANCED ALGEBRA**

**1.0 credit, grades 9-12**

**Prerequisite: Honors Geometry.** The first part of the course is a continuation of Algebra 1 with advanced treatment of linear equations, quadratic equations, inequalities, factoring, irrational numbers and graphing. New topics of study will be negative exponents, quadratic relations, and logarithms.

## **HONORS GEOMETRY**

**1.0 credit, grades 9-12.**

**Prerequisite:** 8<sup>th</sup> grade Algebra 1. This course is the study of plane, analytic and solid geometry. We will describe, model, classify and draw shapes while investigating and predicting results of combining, subdividing and changing shapes. We will study deductive arguments and real world applications and modeling.

## **HONORS PRE-CALCULUS**

**1.0 credit, grades 10-12**

**Prerequisite:** Honors Trigonometry. We will study polynomial functions, rational functions, radical functions and linear programming. Next we will study rational, exponential and logarithmic functions. The course will also include polar coordinates, complex numbers, conic sections and sequences and series. Additional topics will be covered if time permits.

## **HONORS TRIGONOMETRY**

**1.0 credit, grades 9-12**

**Prerequisite:** Honors Advanced Algebra. This course is the study of right triangle trigonometry, circular trigonometric functions, graphing, oblique triangles and equation solutions.

## **INDEPENDENT STUDY**

**0.5 credit, grades 10-12**

**Prerequisite:** Application process. This course is designed for the student in grades 10-12 who desires a more intensive study in a particular discipline than the general curriculum provides. Before registration and the term begin, each student must submit a work-study plan for the term signed by her/his parent/guardian. Upon approval, one copy will be held by the student, one by the teacher and the third given to the counselor. Weekly student-teacher conferences will be arranged to monitor the student's progress. The final project may be evaluated by the entire department before a grade is given. Students selecting this course must be able to work independently and responsibly.

## **INTEGRATED MATHEMATICS 1**

**1.0 credit, grades 9-12**

**Prerequisite:** Pre-Algebra. This course is a study of evaluating expressions, increasingly complex geometry concepts, properties of numbers, more complex exponential and radical equations and expressions, function notation, inequalities and more advanced solving of equations.

## **INTEGRATED MATHEMATICS 2**

**1.0 credit, grades 9-12**

**Prerequisite:** Integrated Math 1. This course is a study of operations with exponents and radicals, graphing algebraic equations, solving systems of equations, set theory, more advanced geometry, complex fractions, factoring, functions, scientific notation and an introduction to probability.

## **INTEGRATED MATHEMATICS 3**

**1.0 credit, grades 9-12**

**Prerequisite:** Integrated Math 2. This course is a study of algebra and geometry including rational expressions and equations, logical reasoning, proof, perpendicular and parallel lines, multiplying and dividing polynomials.

## **INTEGRATED MATHEMATICS 4**

**1.0 credit, grades 9-12**

**Prerequisite:** Integrated Math 3. This course is a study of quadratic equations, simplifying rational expressions, algebraic applications, introduction to trigonometry, radical expressions, vectors, angle relationships and parallelograms.

## **INTEGRATED MATHEMATICS 5**

**0.5 credit, grades 9-12**

**Prerequisite:** Integrated Math 4. This course is a study of complex numbers, bases, arithmetic and geometric means, radicals, logarithms, functions, polynomials, piecewise functions, binomial theorem, trigonometric functions and graphs, and equation solving.

## **INTEGRATED MATHEMATICS 6**

**1.0 credit, grades 9-12**

**Prerequisite:** Integrated Math 5. This course is a study of number sense, expressions, equations, inequalities, functions and graphs, lines, triangles, polygons, circles, logic, proof, summation, trigonometry and probability applications.

## **INTEGRATED MATHEMATICS 7**

**1.0 credit, grades 9-12**

**Prerequisite: Integrated Math 6.** This course is a study of exponentials, logarithms, systems of equations, radicals, complex numbers, functions, conic sections, completing the square, regular polygons, area, inverses, solving trigonometric equations, proving identities and the laws of sines and cosines.

## **INTRODUCTORY STATISTICS**

**0.5 credit, grades 9-12**

**Prerequisite: Algebra 1 or Integrated Math 3.** This course in statistical data analysis and probability is intended to be taken before the third term of the junior year. Topics of study will include producing and interpreting statistical displays, data collection and analysis, measures of center and variation, probability, and normal distributions.

## **MATH LAB**

**0.5 credit, grades 9-10**

**Prerequisite: Referral by counselor or teacher.** Recognizing that Mathematics is a difficult topic for some students, the Math Lab is an academic support center designed for students with a history of difficulty or failure in math. The lab will provide support in mathematics. Students will learn study skills, time management, organization, note taking, and communication skills. The main focus will be on student achievement improving basic skills while increasing mastery of state course expectations.

## **NUMBERS, GAMES AND HEROES**

**0.5 credit, grade 12**

**Prerequisite: Advanced Algebra A or Integrated 4.** In this course students will learn historical math figures and their mathematical theories. It will relate the people and their ideas to games and activities used in history as well as in modern times. Themes carried throughout each unit in the course are how the topics first came to be, what problems they helped to solve, who helped in the creation of these ideas and how we still use these topics today. Topics include magic squares, art, board games, statistics, brainteasers, shapes, mathematical tools, historical figures and cryptography.

## **PRE-CALCULUS**

**1.0 credit, grades 10-12**

**Prerequisite: Geometry and Advanced Algebra.** The first term contains a study of linear and quadratic modeling, the real number system, symmetry of relations, graphing functions through the use of transformations, radian angle measurement, and advanced trigonometric topics. The second term contains the study of rational functions, sequences, series, polar graphing, exponential functions and logarithmic functions.