Algebra and Geometry I

Meets Expectations for Student Learning: 1,2,3,4,7,8,9

Elective Full Year Grades: 9-12 A Level

Prerequisite: Teacher recommendation

This course will investigate and build upon the basic foundations of Algebra and Geometry in an approach that will enable students to make the connections necessary to apply their skills in a variety of application based problems. The units of study will include patterns in data, patterns of change, linear functions, patterns in shape, and exponential functions. Important ideas are continually revisited for students to make connections and develop a lasting understanding of the mathematics they are studying. Graphing calculators and programs such as Sketchpad will be used throughout the course as a tool for problem solving and to develop students' understanding. The TI83 graphing calculator is highly recommended because it is used extensively.

Algebra and Geometry II

Meets Expectations for Student Learning: 1,2,3,4,7,8,9

Elective Full Year Grades: 9-12 A Level

Prerequisite: Past academic performance in Honors Algebra, Algebra I or Algebra & Geometry I and teacher recommendation.

This course is a continuation of the Algebra and Geometry Year 1 course. The units of study will include Functions, Equations and Systems, Coordinate Methods, Regression and Correlation, Quadratic and other Non-Linear Functions and Equations, Probability, Trigonometric Methods and Matrix models. Students who have completed Algebra and Geometry I or a full year Algebra I course must complete this course before continuing on to Advanced Math I. The TI83 graphing calculator is highly recommended because it is used extensively.

Honors Algebra and Geometry II

Meets Expectations for Student Learning: 1,2,3,4,7,8,9

Elective Full Year Grades: 9-12 Honors

Prerequisite: Past academic performance in Honors Algebra, Algebra I or Algebra & Geometry I and teacher recommendation. A placement test may be used.

This course will investigate and build upon topics in Advanced Algebra and Geometry. The units of study will include Functions, Equations and Systems, Coordinate Methods, Regression and Correlation, Quadratic and other Non-Linear Functions and Equations, Probability, Trigonometric Methods and Matrix models. Students who have completed Algebra and Geometry I or a full year Algebra I course must complete this course before continuing on to Advanced Math I. The TI83 graphing calculator is highly recommended because it is used extensively. Students in the Honors level course are expected to develop independent thinking skills as they approach new situations and investigate topics in depth. The TI83 graphing calculator is highly recommended because it is used extensively.

Research Topics and Honors Advanced Math I

Meets Expectations for Student Learning: 1,2,3,4,7,8,9

Elective Full Year Grades: 10 Honors

Prerequisite: Past academic performance in Honors Algebra & Geometry II and teacher recommendation. Must also be enrolled in Research Topics and Honors Chemistry. A placement test may be used.

This course will investigate and build upon topics in Advanced Algebra and Geometry. The units of study will include Functions, Equations and Systems, Coordinate Methods, Regression and Correlation, Quadratic and other Non-Linear Functions and Equations, Probability, Trigonometric Methods and Matrix models. Students who have completed Algebra and Geometry I or a full year Algebra I course must complete this course before continuing on to Advanced Math I. The TI83 graphing calculator is highly recommended because it is used extensively. Students in the Honors level course are expected to develop independent thinking skills as they approach new situations and investigate topics in depth. The TI83 graphing calculator is highly recommended because it is used extensively. This course will also incorporate research methods in Math and Science. Students will be required to complete a

yearlong research project in the field of Math and/or Science under the guidance of their teachers. Students who sign up for this course must also sign up for Research Topics & Honors Introductory Physics. The TI83 graphing calculator is highly recommended because it is used extensively.

Discrete Math I

Meets Expectations for Student Learning: 1,2,3,4,7,8,9

Elective Semester Grade: 12 A-level

Prerequisite: Advanced Math I and Advanced Math II or Advanced Math I and Functions & Trigonometry

This course will examine Discrete Mathematics in the area of Probability and Statistics. Topics will include studying the major concepts and tools for collecting, analyzing, displaying and drawing conclusions from data. Statistics is the science of good decision-making in the face of uncertainty and is used in many disciplines such as financial analysis, economics, auditing, marketing research, production and operations. In this course, students will learn the fundamentals of descriptive and inferential statistics and how to apply them in everyday situations. Technology will be used throughout the course including the features from a TI-83 graphing calculator as well as functions used in Microsoft Excel. This course will also include a component to continue to prepare students for standardized testing such as college entrance and placement exams. The fundamental topics in courses through Advanced Math II will be reviewed and reinforced.

Discrete Math II

Meets Expectations for Student Learning: 1,2,3,4,7,8,9

Elective Semester Grade: 12 A-level

Prerequisite: Advanced Math I and Advanced Math II or Advanced Math I and Functions & Trigonometry

This course will examine Discrete Mathematics in the areas of management science, social science, graph theory, number theory, and computer science. Students will study how to apply mathematics to a wide range of challenging problems on the cutting edge of modern research. Discrete Math influences everything from entrepreneurial successes and coding theories to the fairness of voting practices. This course will also include a component to continue to prepare students for standardized testing such as college entrance and placement exams. The fundamental topics in courses through Advanced Math II will be reviewed and reinforced.

Honors Advanced Math I

Meets Expectations for Student Learning: 1,2,3,4,7,8,9

Elective Full Year Grades: 10-12 Honors

Prerequisite: Past academic performance in Honors Algebra & Geometry II or Algebra & Geometry II and teacher recommendation. A placement test may be used

This higher-level mathematics course will further the study of topics in Advanced Algebra, Geometry and Trigonometry to prepare students for the study of pre-calculus and Calculus. The units of study will include Reasoning and Proof, Inequalities and Linear Programming, Similarity and Congruence, Polynomial and Rational Functions, Circles and Circular Functions, Modeling Sequential Change, and Inverse functions. Students in the Honors level course are expected to develop independent thinking skills as they approach new situations and investigate topics in depth. The TI83 graphing calculator is highly recommended because it is used extensively.

Advanced Math I

Meets Expectations for Student Learning: 1,2,3,4,7,8,9

Elective Full Year Grades: 10-12 A Level

Prerequisite: Algebra& Geometry I and II and teacher recommendation.

This higher-level mathematics course will further the study of topics in Advanced Algebra, Geometry and Trigonometry to prepare students for the study of pre-calculus and Calculus. The units of study will include Reasoning and Proof, Inequalities and Linear Programming, Similarity and Congruence, Polynomial and Rational Functions, Circles and Circular Functions, Modeling

Sequential Change, and Inverse functions. The TI83 graphing calculator is highly recommended because it is used extensively.

Advanced Math II

Meets Expectations for Student Learning: 1,2,3,4,7,8,9

Elective Full Year Grades: 11-12 A Level

Prerequisite: Past academic performance in Advanced Math I or Honors Advanced Math I and teacher recommendation.

This pre-calculus course formalizes and extends important mathematical ideas drawn from the four strands of Algebra and Functions, Geometry and Trigonometry, Statistics and Probability and Discrete Mathematics. The focus will be on the Mathematics needed to be successful in college mathematics, Statistics, or Calculus courses. Topics studied will include the fundamental concepts underlying calculus and their applications including: rate of change, modeling motion, logarithmic, polynomial, and rational functions, conic sections. Emphasis will also be placed on manipulating symbolic representations of polynomial, rational, exponential, logarithmic, and trigonometric functions. Other topics will support further study in Probability and Statistics, including counting models, mathematical induction, binomial distributions, and statistical inference.

Honors Advanced Math II

Meets Expectations for Student Learning: 1,2,3,4,7,8,9

Elective Full Year Grades: 11-12 Honors

Prerequisite: Past academic performance in Honors Advanced Math I or Advanced Math I and teacher recommendation. A placement test may be used.

This pre-calculus course formalizes and extends important mathematical ideas drawn from the four strands of Algebra and Functions, Geometry and Trigonometry, Statistics and Probability and Discrete Mathematics. The focus will be on the Mathematics needed to be successful in college mathematics, Statistics, or Calculus courses. Topics studied will include the fundamental concepts underlying calculus and their applications including: rate of change, modeling motion, logarithmic, polynomial, and rational functions, conic sections. Emphasis will also be placed on manipulating symbolic representations of polynomial, rational, exponential, logarithmic, and trigonometric functions. Other topics will support further study in Probability and Statistics, including counting models, mathematical induction, binomial distributions, and statistical inference. Students who successfully complete this rigorous course are ready for Advanced Placement Calculus AB, Advanced Placement Calculus BC, or Advanced Placement Statistics. The TI83 graphing calculator is highly recommended because it is used extensively.

Honors Statistics

Meets Expectations for Student Learning: 1,2,3,4,7,8,9

Elective Full Year Grade: 12 Honors

Prerequisite: Past academic performance in Honors Advanced Math II or A-level Advanced Math II, strong teacher recommendation.

This course will investigate the major concepts and tools for collecting, analyzing, and drawing conclusions from data. The four major conceptual themes are: 1) Exploring Data: Interpreting and analyzing graphical displays and descriptive statistics, 2) Sampling & Experimentation: Planning and conducting observational studies and experiments, 3) Probability and Simulation: Exploring random phenomena, and 4) Statistical Inference: Estimating population parameters and testing hypotheses. One major project per theme will be assigned. The TI-83/84 graphing calculator will be used extensively.

Honors Calculus

Meets Expectations for Student Learning: 1,2,3,4,7,8,9

Elective Full Year Grade: 12 Honors

Prerequisite: Past academic performance in Honors Advanced Math II or Advanced Math II and teacher recommendation. A placement test may be used.

A firm foundation in calculus is necessary for pursuing careers in science, mathematics, business, and some social sciences. The intent of the course is to teach the subject matter with a level of rigor suitable for the mainstream calculus student. This course is not designed for those wishing to take CEEB Advanced Placement Test. The student must have a strong background in trigonometry, coordinates, graphs, lines, functions, and algebraic manipulations. Topics include: functions and limits, differentiation, applications of differentiation, integration, applications of the definite integral, logarithmic and exponential functions, inverse and hyperbolic functions, and techniques of integration. A TI83 graphing calculator is recommended because it is used extensively. Summer reading and/or a special project may be required.

Advanced Placement Calculus AB

Meets Expectations for Student Learning: 1,2,3,4,7,8,9

Elective Full Year Grade: 12 Advanced Placement

Prerequisite: Past academic performance in Honors Advanced Math II, strong teacher recommendation, successful completion of summer work. A placement test may be used.

A firm foundation in calculus is necessary for pursuing careers in science, mathematics, business, and some social sciences. AP Calculus should provide the building materials for success on the advanced placement exam, thus enabling those students who successfully complete this course to begin their college careers on firm footing. In order to have a successful year students must understand that calculus will involve a great deal of their time and energy during the year and in preparation for the AP exam. Topics to be studied include polynomial, trigonometric, logarithmic, and exponential functions and their graphs; limits; differentiation; integration; applications of each of these; definite integrals; and techniques of integration. A TI83 graphing calculator is required. Summer reading and/or a special project may be required. Students are expected to take the Advanced Placement Exam in May.

Advanced Placement Calculus BC

Meets Expectations for Student Learning: 1,2,3,4,7,8,9

Elective Full Year Grade: 12 Advanced Placement

Prerequisite: Past academic performance in Honors Advanced Math II, strong teacher recommendation, successful completion of summer work. A placement test may be used.

A firm foundation in calculus is necessary for pursuing careers in science, mathematics, business, and some social sciences. AP Calculus BC should provide the building materials for success on the advanced placement exam, thus enable those students who successfully complete this course to begin their college careers on firm footing. In order to have a successful year students must understand that calculus will involve a great deal of their time and energy during the year and in preparation for the AP exam. Topics to be studied include polynomial, trigonometric, logarithmic, and exponential functions and their graphs; polar and parametric curves; limits; differentiation; integration; applications of each of these; definite integrals; basic and advanced techniques of integration; series. Summer reading and/or a special project may be required. Students are expected to take the Advanced Placement Exam in May.

Advanced Placement Statistics

Meets Expectations for Student Learning: 1,2,3,4,7,8,9

Elective Full Year Grade: 12 Advanced Placement

Prerequisite: Past academic performance in Honors Advanced Math II or A-level Advanced Math II, strong teacher recommendation, successful completion of summer work.

This course will investigate the major concepts and tools for collecting, analyzing, and drawing conclusions from data. The four major conceptual themes are: 1) Exploring Data: Interpreting and analyzing graphical displays and descriptive statistics, 2) Sampling & Experimentation: Planning and conducting observational studies and experiments, 3) Probability and Simulation: Exploring random phenomena, and 4) Statistical Inference: Estimating population parameters and testing hypotheses. Summer work and an end-of-year project are required. Students are expected to take the AP exam in the spring. The focus throughout the year will be on preparation for the AP exam, with the goal of completing all of the curriculum with the rigor of a college level course. The TI-83/84 graphing will be used extensively.

Freshman Seminar

Meets Expectations for Student Learning: 1,2,3,4,7,8,9

Elective Semester Grade: 9 A Level

Prerequisite: Student must be enrolled in Algebra and Geometry I and teacher recommendation.

This semester long course provides extra instructional time with a content area teacher to support the curriculum in the students' regular Mathematics course. In addition, students will complete a curriculum that will provide them with the organizational and study skills necessary for success with their high school Math class as well as standardized assessments. Students must be recommended by a Math teacher to participate in the Freshman Seminar.

Sophomore Seminar

Meets Expectations for Student Learning: 1,2,3,4,7,8,9

Elective Semester Grade: 10 A Level

Prerequisite: Student must be enrolled in Algebra and Geometry II or Advanced Math I and teacher recommendation.

This semester long course provides extra instructional time with a content area teacher to support the curriculum in the students' regular Mathematics course. In addition, students will complete a curriculum that will provide them with the organizational and study skills necessary for success with their high school Math class as well as standardized assessments. Students must be recommended by a Math teacher to participate in the Sophomore Seminar.

Math Internship

Meets Expectations for Student Learning: 1,2,3,4,7,8,9

Elective Semester Grades: 11-12 A Level

Prerequisite: Past academic performance in Advanced Math II or Honors Advanced Math II and teacher recommendation.

Students will be assigned by the department director to work in an underclassmen class as an assistant to the teacher in that class. Interns will assist in their assigned class by helping students as needed with their questions on class work. The teacher may ask interns to facilitate work with small groups of students or create study guides and review materials with or for students. The intern may also assist students with the creation and organization of their notebooks and mathematics toolkits. Students who participate in this program will meet with their cooperating teacher and will complete monthly feedback forms. The grade for this class will be a pass/fail grade determined by attendance and the feedback forms completed by both the teacher and student.

Research Topics and Honors Algebra & Geometry II

Meets Expectations for Student Learning: 1,2,3,4,7,8,9

Elective Full Year Grade: 9 Honors

Prerequisite: Teacher recommendation. Must also be enrolled in Honors Introductory Physics.

This higher-level mathematics course will further the study of topics in Advanced Algebra, Geometry and Trigonometry to prepare students for the study of pre-calculus and Calculus. The units of study will include Reasoning and Proof, Inequalities and Linear Programming, Similarity and Congruence, Polynomial and Rational Functions, Circles and Circular Functions, Modeling Sequential Change, and Inverse functions. Students in the Honors level course are expected to develop independent thinking skills as they approach new situations and investigate topics in depth. This course will also incorporate research methods in Math and Science. Students will be required to complete a yearlong research project in the field of Math and/or Science under the guidance of their teachers. Students who sign up for this course must also sign up for Research Topics & Honors Chemistry. The TI83 graphing calculator is highly recommended because it is used extensively.

Functions & Trigonometry

Meets Expectations for Student Learning: 1,2,3,4,7,8,9

Elective Full Year Grades: 11-12 A Level

Prerequisite: Past academic performance in Algebra & Geometry II and Advanced Math I.

This course in higher-level mathematics will continue to explore multi-variable models, formalization of the concept of functions, function notation, domain and range. Students will use linear, exponential, quadratic and other polynomial functions to model situations. Trigonometric models will also be studied. This course will prepare students for Advanced Math II or college level mathematics courses. The TI83 graphing calculator is highly recommended because it is used extensively.