

# **MATHEMATICS**

The Math Department offers a variety of courses for the college bound and non-college bound student. Students should be aware that many colleges and universities require four credits for admission. Activities in all math classes include in-class work, homework assignments, problem solving, practical applications, and the use of technology. A calculator is required for all math classes. Some prerequisites may be waived by permission of the instructor. The Math department is dedicated to ensuring that every Horizon student graduates with a strong background in the fundamentals of algebra, geometry, and statistics.

## **CONTEMPORARY MATHEMATICS I**

(Single period - 2250/Block - 2250B)

**9,10,11,12**

**1 credit**

Contemporary Mathematics I begins the integrated development of high school mathematics along the interwoven strands of algebra, functions, geometry, trigonometry, statistics and probability. Focused units of study connect these strands through an emphasis on data collection, multiple-representations, interpretation and prediction in an active and collaborative setting. Students will be able to use and apply mathematical concepts and skills involving: data analysis, linear relations, exponential relations, probability, symmetry and geometric measurement.

## **CONTEMPORARY MATHEMATICS II**

(Single period – 2255/Block – 2255B)

**9,10,11,12**

**1 credit**

Contemporary Mathematics II continues the integrated development of high school mathematics along the interwoven strands of algebra, functions, geometry, trigonometry, statistics and probability. Focused units of study connect these strands through an emphasis on data collection, multiple-representations, interpretation and prediction in an active and collaborative setting. Students will be able to use and apply mathematical concepts and skills involving: matrices, quadratic relations, linear systems, correlation, regression, probability, coordinate geometry, trigonometric graphs and similarity.

PREREQUISITE: Contemporary Mathematics I

## **CONTEMPORARY MATHEMATICS III**

(Single period – 2260/Block – 2260B)

**9,10,11,12**

**1 credit**

Contemporary Mathematics III continues the integrated development of high school mathematics along the interwoven strands of algebra, functions, geometry, trigonometry, statistics and probability. Focused units of study connect these strands through an emphasis on data collection, multiple-representations, interpretation and prediction in an active and collaborative setting. Students will be able to use and apply mathematics concepts and skills involving: linear systems and inequalities, linear programming, sampling and sampling distributions, polynomial, exponential, and rational expressions, inductive and deductive reasoning, probability, geometric and algebraic transformations, and arithmetic and geometric sequences and series.

PREREQUISITE: Contemporary Mathematics II

## **CONTEMPORARY MATHEMATICS IV**

(Single period – 2261)

**11,12**

**1 credit**

Contemporary Mathematics IV continues the integrated development of high school mathematics along the interwoven strands of algebra, functions, geometry, trigonometry, and statistics and probability. Focused units of study include the processes of data collection, representation, interpretation, prediction, and simulation. Models developed in Course IV come from many diverse areas such as physics, economics, navigation, sports, health care, finance, biology, political science, sociology, and engineering. The use of graphing calculators will be emphasized and students are encouraged to purchase a graphing calculator.

PREREQUISITE: Recommended “C” or better in Contemporary Mathematics III.

## **ALGEBRA I I-2020**

**11, 12**

**1 credit**

Algebra II course topics typically include field properties and theorems; set theory; operations with rational and irrational expressions; factoring of rational expressions; in-depth study of linear equations and inequalities; quadratic equations; solving systems of linear and quadratic equations; graphing of constant, linear, and quadratic equations; properties of higher degree equations; and operations with rational and irrational exponents.

**TEACHER RECOMMENDATION ONLY**

## **DISCRETE MATHEMATICS -2903**

**12**

**1 credit**

Discrete Mathematics courses include the study of topics such as number theory, discrete probability, set theory, symbolic logic, Boolean algebra, combinatorics, recursion, basic algebraic structures, and graph theory.

PREREQUISITE: Contemporary Mathematics III

## **TRIGONOMETRY/PRE-CALCULUS**

**(Single period – 2115/Block 2115B)**

**10, 11, 12**

**1 credit**

Trig/Pre-Calculus courses combine the study of Trigonometry, Elementary Functions, Analytic Geometry, and Math Analysis topics as preparation for calculus. Topics typically include the study of complex numbers; polynomial, logarithmic, exponential, rational, right trigonometric, and circular functions, and their relations, inverses and graphs; trigonometric identities and equations; solutions of right and oblique triangles; vectors; the polar coordinate system; conic sections; sequences and series.

PREREQUISITE: Recommended “C” or better in Contemporary Mathematics III.

## **AP STATISTICS - 2175**

**10, 11, 12**

**1 credit**

Probability and Statistics courses focus on descriptive statistics, with an introduction to inferential statistics. Topics typically include event probability, normal probability distribution, collection and description of data, frequency tables and graphs, measures of central tendency and variability, random variables, and random sampling. Course topics may also include covariance and correlation, central limit, theorem, confidence intervals, and hypothesis testing.

PREREQUISITE: Contemporary Mathematics IV or Trig/Pre-Calculus. Recommended “C” or better in Trig/Pre-Calculus or CMIC IV.

## **AP CALCULUS AB - 2000**

**11, 12**

**1 credit**

This class is equivalent to a first semester college calculus and analytic geometry course and follows the College Board’s suggested curriculum designed to parallel college-level calculus courses. AP Calculus AB provides students with an intuitive understanding of the concepts of calculus and experience with its methods and applications. Topics covered include elementary functions, properties of functions and their graphs, limits and continuity, differential calculus (including definition of the derivative, derivative formulas, theorems about derivatives, geometric applications, optimization problems, and rate-of-change problems), and integral calculus (including anti derivatives and the definite integral). Activities include in-class oral and written work and *extensive* work outside the classroom. Students will need to purchase a graphing calculator. Students are required to take the AP Calculus AB Test and can earn 4 college credits by receiving a satisfactory score on the AP Calculus AB test.

PREREQUISITE: Recommended “C” or better in Trigonometry/Pre-Calculus or Contemporary Math IV.

**AP CALCULUS BC - 2005****11, 12****1 credits**

Following the College Board's suggested curriculum designed to parallel college-level calculus courses, AP Calculus BC courses provide students with an intuitive understanding of the concepts of calculus and experience with its methods and applications, and also require additional knowledge of the theoretical tools of calculus. These courses assume a thorough knowledge of elementary functions, and cover all of the calculus topics in AP Calculus AB as well as the following topics: vector functions, parametric equations, and polar coordinates; rigorous definitions of finite and nonexistent limits; derivatives of vector functions and parametrically defined functions; advanced techniques of integration and advanced applications of the definite integral; and sequences and series.

PREREQUISITE: Recommended "C" or better in AP Calculus AB

**CALCULUS III – 2007****11, 12****1 credits**

This course continues the study of derivatives, differentiation, integration, the definite and indefinite integral, and applications of calculus. Typically, students have previously attained knowledge of pre-calculus topics (some combination of trigonometry, elementary functions, analytic geometry, and math analysis). Multivariate Calculus courses include the study of hyperbolic functions, improper integrals, directional derivatives, and multiple integration and its applications. Differential Calculus courses include the study of elementary differential equations including first- and higher-order differential equations, partial differential equations, linear equations, systems of linear equations, transformations, series solutions, numerical methods, boundary value problems, and existence theorems.

PREREQUISITE: Teacher Recommendation.