Mathematics Required Courses

Campbell Hall requires 3 years of math to fulfill graduation requirements. All new Campbell Hall students are required to take a math placement test. All students must earn a C- or higher in a course to advance to the next level. Prerequisites listed after course descriptions below are for initial placements. Multiple measures will be used to determine a student's final math placement as described in the [course placement process](#) section under High School Course Descriptions.

Algebra I: This foundational course covers all standard topics of a first-year algebra curriculum. Topics include relations and functions, laws of exponents, linear and quadratic equations, polynomials and factoring, rational and irrational expressions, systems of linear equations and inequalities, algebraic applications in geometry, logic, probability and statistics. Students will write math paragraphs to explain a mathematical algorithm, concept, or activity. The curriculum emphasizes connections within mathematics and to other disciplines, develops concepts through real-world applications, and encourages independent and cooperative learning. (*Grade 9; prerequisite: Pre-Algebra or Principles of Algebra*)

Geometry: This course is designed to prepare students in the investigation, understanding, and application of plane geometry. Course topics include parallel lines, congruent triangles, quadrilaterals, similarity, circles, polygon area, right triangle applications involving special right triangles and trigonometry, and volume and surface area of solids. Throughout the year, students incorporate the writing of formal, two-column proofs to further investigate geometric concepts. Students use visualization, spatial reasoning, algebra and geometric modeling to solve problems. Students see the power of deductive proof in establishing the validity of general results from given conditions. In addition to two column direct proofs, students also produce logical arguments by engaging in paragraph and flowchart proofs. Students use algebraic techniques as an integral part of the exploration of theorems, postulates and corollaries. *(Prerequisite: Successful completion of Algebra 1)*
OR
Geometry Honors: This is the second course in a challenging five-course series designed for students seeking a more rigorous approach to mathematics. This Euclidean plane and solid geometry course extensively studies the properties, measurement, and relationships of points, lines, planes, angles, 2-dimensional shapes, and 3-dimensional solids. Special attention is given continually to the reasoning and logic needed to understand and display proof. Throughout the year, this course is infused with algebra and enriched with geometry's historical origins and contemporary applications. Transformational geometry, the foundations of trigonometry, and an in-depth study of coordinate geometry are included. Computer applications and the graphing calculator assist in discovering, visualizing and verifying results. Topics are presented in more depth and assessments require students to think critically, apply concepts to real-world applications and synthesize information. *(Prerequisites: grade of B in Algebra I Honors, A- in Algebra I)*

Algebra IIA: This course expands upon topics introduced in Algebra I. Students will review topics including the real number line, algebraic properties, order of operations, relations and functions, and extend their skills in solving quadratic equations involving rational and irrational roots. Students learn additional methods of factoring and explore the basic concepts of exponents and logarithms. Algebra IIA will also include an introduction to conic sections, probability and statistics. This course

allows students to use real-world applications to master topics. In addition, students will continue to review topics from previous math courses within the scope of the curriculum of Algebra IIA. Use of graphing calculators, special projects, and group presentations may be part of the instructional methods used to master the curriculum. *(Prerequisite: Geometry)*

OR

Algebra IIB: Students deepen their understanding of the real number line, review relations and functions, and extend their skills in solving quadratic equations involving rational and irrational roots. Students continue their study of polynomial factoring and explore the use of exponents and logarithms. The curriculum also includes probability, conic sections, combinations and permutations. This course promotes problem solving skills and solutions requiring good insights into math theory and strong algebra skills. Use of graphing calculators, special projects and group presentations may be a part of the instructional methods used to master the curriculum. *(Prerequisites: grade of B in Geometry)*

OR

Algebra II Honors: This is the third course in a challenging five-course series designed for students seeking a more rigorous approach to mathematics. As part of the curriculum, Algebra II Honors stresses real world applications and problem-solving techniques. Curriculum in this course includes and expands topics from Algebra I Honors. New topics include polynomial, rational, exponential, and logarithmic functions. In addition, conic sections are thoroughly studied including graphing, finding solutions, or solution regions of multiple graphs. Trigonometric functions and their values in each quadrant are covered in addition to the applications of right triangles. Students use a graphing calculator to enhance and illustrate mathematical concepts in this course. Topics are presented in more depth and assessments require students to think critically, synthesize information and apply concepts to non-routine and open-ended questions. *(Prerequisites: grade of B in Geometry Honors or grade of A- in Geometry)*

Mathematics Elective Courses

Fundamentals of Precalculus: This course furthers the student's study of algebraic functions and allows review of algebraic principles presented in Algebra II. In addition, Fundamentals of Precalculus introduces the topics of trigonometric functions, rational functions, and exponential and logarithmic functions. The curriculum for this course includes basic probability and statistics. More key sequences of the graphing calculator will be studied and students will apply concepts to real-world applications. Students will learn how to display, describe, transform, and interpret numerical information represented as data, graphs or equations. *(Prerequisite: Algebra II)*

OR

Precalculus with Trigonometry: This course is designed to integrate the subject matter of trigonometry and third-year algebra. A unified approach to precalculus covers the major topics of advanced algebra including higher order polynomials, advanced graphic techniques, inequalities, exponential and logarithmic functions, matrix and vector analysis, polar coordinates and complex numbers, and conic sections. The trigonometry curriculum includes an analysis of the unit circle, graphs of trigonometric functions, inverses, using identities, and solving equations. Students engage in formal direct and indirect proofs of theorems and trigonometric identities. The curriculum for this course also includes basic probability and statistics. The use of a graphing calculator and projects will be used as learning opportunities within the curriculum. Students will learn how to

display, describe, transform, and interpret numerical information represented as data, graphs, or equations. *(Prerequisite: grade of B in Algebra II B or grade of A- in Algebra II A)*
OR
†Precalculus with Trigonometry Honors: The fourth in a five-course series designed for students seeking a more rigorous approach to mathematics, this course integrates the subject matter of trigonometry and third-year algebra and covers the major topics of advanced algebra including higher order polynomials, advanced graphing techniques, inequalities, matrix algebra, exponential and logarithmic functions, and complex number systems including DeMoivre's Theorem, polar equations with multiple solution techniques, vectors, series, and sequences. Trigonometry topics include functions and their inverses using the unit-circle approach, graphs of these functions, trigonometric identities and equations and applications of trigonometry. This course is suitable for students specifically requiring strong preparation in math leading to further upper division math and science courses. Topics are presented in more depth and assessments require students to think critically, apply concepts to real-world applications, and synthesize information. *(Prerequisite: grade of A- in Algebra II B or grade of B in Algebra II Honors)*

Fundamentals of Calculus: This course focuses on strengthening mathematical skills and developing techniques for applying limits, the derivative, and integration to a variety of problems. Each topic focuses on mastering the skill and applying it to new situations. This course is presented in a less theoretical approach than an honors or Advanced Placement course and serves as a good introduction to college calculus. The first trimester of this course is algebra review (the algebraic content is referred to as Algebra III.) The second and third trimester consists of the basic components of calculus including derivatives and integrals. Graphing calculators, calculator-based applications, and computer software are used to illustrate and enhance topics covered throughout the year. *(Prerequisite: Fundamentals of Precalculus)*
OR
Calculus: This fifth-year math course includes theory and evaluation techniques of limits, derivatives, and integrals involving algebraic, trigonometric, logarithmic, and exponential functions. Applications of calculus are explored in the various fields of engineering, business, physics, and biology. Graphing calculators, calculator-based applications, and computer software are used to illustrate and enhance topics covered throughout the year. *(Prerequisite: grade of B in Precalculus with Trigonometry or grade of A- in Fundamentals of Precalculus)*

†AP Calculus AB: This course is designed for honors mathematics students who wish to work at the college level and have completed a traditional precalculus and trigonometry course. The unifying themes of limits, derivatives, integrals, continuity, approximation, and extensive applications and modeling are developed using all the prerequisite course functions: linear, polynomial, rational, exponential, logarithmic, trigonometric, and piecewise defined. Concepts, results and problems are expressed in multiple ways: geometrically, numerically, analytically, and verbally. Technology is used regularly (a graphing calculator is required) to reinforce the relationships among the multiple representations of functions, to confirm written work, to implement experimentation, and to assist in interpreting results. *(Prerequisite: grade of B in Calculus, grade of B in Precalculus with Trigonometry Honors, grade of A- in Precalculus with Trigonometry; an A in Fundamentals of Precalculus does not qualify for automatic enrollment)*

*†AP Calculus BC: This is the final course in the traditional mathematics series designed for students who have excellent insights into theory and wish to work at the college level. Topics include numerical methods of integration such as Euler's Method, slope fields, analysis of parametric and polar curves, improper integrals, vector-valued functions, infinite series, and elementary differential equations. Concepts, results, and problems are expressed in multiple ways: geometrically, numerically, analytically, and verbally. Technology is used regularly (a graphing calculator is required) to reinforce relationships among multiple representations of functions, to confirm written work, to implement experimentation, and to assist in interpreting results. *(Prerequisite: grade of B in AP Calculus AB; a grade of A in Calculus does not qualify for automatic enrollment)*

†Multivariable Calculus Honors: Multivariable Calculus focuses on the study of functions that depend on two or more variables. Students learn how to analyze and visualize these functions in higher-dimensional spaces. Topics typically covered include partial derivatives, gradient vectors, multiple integrals, and vector fields. The class also explores concepts like optimization, where students determine the maximum and minimum values of functions subject to constraints. Applications of multivariable calculus are emphasized, such as in physics, engineering, and economics, where these techniques are used to model real-world phenomena. By the end of the course, students will have a deeper understanding of how to analyze complex systems with more than one variable.

†AP Macroeconomics: This course is designed to give the student a thorough college-level understanding of the principles of economics that apply to an economic system as a whole. Such a course places particular emphasis on the study of national income and price determination, and also develops familiarity with economic performance measures, economic growth, and international economics. This is not considered a math course by the University of California. *(Grades 11, 12; prerequisites: no more than one grade of C+ or below in a regular class or C or below in an advanced-level class at the end-of-year marking period immediately preceding enrollment in the course; completion of Pre-Calculus and Trigonometry with grade of B or higher)*

†AP Statistics: This course prepares students to master the theory and practice of four broad themes in statistics: describing data (exploratory data analysis), collecting data (sampling, experimental design, sampling design), understanding random behavior (constructing simulations, probability), and making conclusions from data (inference). Students analyze case studies and instructive examples. Students frequently work on projects involving the hands-on gathering and analysis of real-world data. Ideas and computations presented in this course have immediate links and connections with actual events. Computers and calculators allow students to focus deeply on the concepts involved in statistics. *(Grades 11, 12; prerequisites: no more than one grade of C+ or below in a regular class or C or below in an advanced-level class at the end-of-year marking period immediately preceding enrollment in the course; completion of Pre-Calculus and Trigonometry with grade of B or higher)*

The Business of Sports: Sports is a multimillion dollar industry. Beyond the athletes that compete are tens of thousands of men and women who make a living in the sports industry. This course

examines the many facets of professional and college sports that generate vast amounts of money worldwide. Using statistical analysis, economical principles, and social standards, we will discuss how the money is earned and dispersed in the four major American professional sports, the NCAA (both men's and women's divisions), and world soccer. We will use these arenas as a framework for the study of finance, contracts, media, scouting, sports medicine, marketing, and merchandising. *(Grades 11,12; one semester)*