

# MATHEMATICS

“C” Requirement: Three years of Mathematics, through Algebra II/Integrated Math III, required for UC/CSU.

## 52030 Integrated Math I

UC/CSU approved.

Grades: 9-12 Credits: 10 (year-long course) UC/CSU:  (fulfills C requirement)

Integrated Math I is the first course of a rigorous two course sequence including Integrated Math I and II. All freshmen taking this class will be on track to study pre-calculus or calculus in their senior year (depending on test results). This course will develop a student’s problem-solving skills, critical thinking abilities, and strengthen situational analysis abilities.

## 52050 Integrated Math I Honors

UC/CSU approved. Meets Math requirement.

Grade: 9-10 Credits: 10 (year-long course, possibly weights) UC/CSU:  (fulfills C requirement) Prerequisites: Grade of B or higher in eighth grade mathematics and/or entrance exam score criteria met.

Content: This course will help students understand the basic structure of algebra and more specifically the in depth study of linear functions with one and two variables. Students will be expected to extend their thinking through the idea of modeling with functions. This course will also explore geometric constructions and the basic principles that make up the concept of congruence. Through basic rigid motions, students will explore congruence.

## 52130 Integrated Math II

UC/CSU approval. Meets Math requirement.

Grades: 9-12 Credits: 10 (year-long course) UC/CSU:  (fulfills C requirement)  
Prerequisites: Completion of Integrated Math I.  
Course Challenge Option

Math II is a math course in the study of algebraic expressions, equations, inequalities, and functions. This course complements and expands the mathematical content and concepts of Math I. Some of the topics covered include complex numbers, exponents, radicals, matrices, systems of linear equations, functions (absolute value, exponential, logarithmic, quadratic, radical, polynomial, and rational) and their behavior, solving nonlinear equations, conic sections, combinatorics, probability, and sequences/series.

## 52155 Integrated Math II Honors

UC/CSU approval. Meets Math requirement.

Grade: 9-12 Credits: 10 (year-long course and weighted) UC/CSU:  (fulfills C requirement)

Prerequisites: Grade of B or higher in Integrated Math 1 or a C or higher in Integrated Math I Honors. Course Challenge Option

A hand-held scientific calculator is recommended but not required. Content: This course will help students further understand the basic structure of algebra and more specifically the in depth study of quadratic functions through modeling and construction. Students will be expected to extend their thinking abstractly by performing arithmetic operations with complex numbers. The students will also be expected to write expressions that represent relationships, rewrite expressions in equivalent forms and solve systems of equations. As well, students will study and recognize independence and conditional probabilities. Through modeling, they will evaluate outcomes of probability situations. Geometrically, this course will prove all concepts related to similarity and congruence of shapes. Students will use algebra and coordinate geometry to prove theorems. This course will analyze all theorems of circles and relate this content to that of conic sections as well as require students to explain volume formulas and apply them to a variety of shapes.

## **52300 Math Analysis**

UC/CSU approved course. Meets Math and Electives requirement.

Grades: 11 -12 Credits: 10 (year-long course) UC/CSU:  (fulfills C & G requirement) Prerequisite: Grade of C or higher in Integrated Math III.

Math Analysis concentrates on algebra and functions, with particular attention paid to graphing and solving linear, quadratic, polynomial, rational, exponential and logarithmic functions. Applications include maxima/minima problems, average rate of change, and compound interest. For the second semester, the course then shifts to trigonometry, with discussions of trigonometric ratios, radian measure, trigonometric graphs and applications of trigonometry. Throughout the course, students will learn to effectively use a graphing calculator to explore, analyze and explain results.

## **52325 Statistics**

UC/CSU approved course. Meets Math and Electives requirement. .

Grades: 11-12 Credits 10 (year-long course) UC/CSU:  (fulfills C & G requirement) Prerequisite: Grade of C or higher in Integrated Math II

This course will introduce students to the major concepts and tools for collecting, analyzing and drawing conclusions from data. Students are exposed to four broad conceptual themes: observing and exploring data; planning a statistically valid investigation; anticipating patterns and using probability and simulations for predicting outcomes; and confirming or rejecting models through statistical inference. Technology is an integral part of the course. Graphing calculators are required (TI-80 series) and computer skills are necessary.

## **52330 Integrated Math III**

UC/CSU approved course. Meets Math requirement.

Grades: 10-12 Credits 10 (year-long course) UC/CSU:  (fulfills C requirement) Prerequisites: Completion of Integrated Math II or Integrated Math II Honors.

Integrated Math III is the third course in a three year course sequence including Integrated Mathematics I, Integrated Mathematics II, Math II Honors, and Math III Honors. The Integrated Math III course focuses on modeling functions of their graphs, composition/decomposition, and the inverses of linear, exponential, and quadratic functions. Students will further their knowledge and build upon prior relationships of linear, exponential, and quadratic functions they have studied in Integrated Math I and Math II.

### **52335 Integrated Math III Honors**

UC/CSU approved course. Meets Math requirement.

Grades: 10-12 Credits 10 (year-long course and weighted) UC/CSU:  (fulfills C requirement) Prerequisites: Grade of B or higher in Integrated Math II or a C or higher in Integrated Math II Honors (or appropriate course from outside the district).

Integrated Mathematics III Honors is the third course of a three-year course sequence including Integrated Mathematics I, Integrated Mathematics II Honors, and Integrated Mathematics III Honors. The Integrated Math III Honors course focuses on modeling functions of their graphs, composition/decomposition, and the inverses of linear, exponential, and quadratic functions. Students will further their knowledge and build upon prior relationships of linear, exponential, and quadratic functions they have studied in Integrated Math I and Math II Honors.

### **52410 Transition to College Level Math**

UC/CSU approved course. Meets Math requirement.

Grades: 11-12 Credits 10 (year-long course) UC/CSU:  (fulfills C & G requirement) Prerequisites: Grade of C or higher in Math III or other equivalent course.

Transition to College Level Mathematics includes four main sections: Data; Computing; Decision Making; and Geometry. Each section has two to three units of study to include: modeling with functions; interpreting categorical data; statistical inference; counting methods; graph theory applications; informatics; financial decision making; fair decision making; visualizing and representing shapes; and, symmetries and tiling. The emphases of the course are on modeling, problem solving and applications of mathematics to the real world, with stress on developing deeper understanding of mathematical concepts and relationships already studied.

### **52350 Advanced Placement Statistics**

UC/CSU approved course. Meets Math requirement.

Grade: 11-12 Credits 10 (year-long course and weighted) UC/CSU:  (fulfills C & G requirement) Prerequisite: Grade of B or higher in Statistics or Integrated Math III, Integrated Math III Honors, or Math Analysis

The purpose of the AP course in statistics is to prepare students for college level statistics courses.

The curriculum is approved by The College Board. Students are exposed to four major conceptual themes: exploring Data, describing patterns and departures from patterns; Sampling and experimentation, planning and conducting a study; anticipating patterns, exploring random phenomena using probability and simulation; statistical inference, estimating population parameters and testing hypothesis. Graphing calculators are required (TI-80 series) and computer skills are necessary. Students who successfully complete this course are prepared to take the AP Statistics exam and have the ability to earn college credit and advanced standing by passing the exam. Student is required to take the AP Exam in May.

## **52400 Calculus**

UC/CSU approved course. Meets Math requirement.

Grade: 11-12 Credits: 10 (year-long course) UC/CSU:  (fulfill C & G requirement) Prerequisite:

Grade of B or higher in Integrated Math III, Integrated Math III Honors, or Math Analysis

This is a college preparatory course aimed at the education of the student in the nature of mathematics as a logical system. The subject matter includes sets, algebra of numbers as a logical system, inequalities, functions (circular, linear, quadratic and higher degree, polynomial, exponential, and logarithmic) and function symmetries; conic relations, radian measure, arc length and sector area; the six trigonometric functions, their inverses and their graphs; triangle trigonometry, trigonometric identities and their proofs; polar coordinates, complex numbers and complex coordinates; vectors and parametric equations, along with practical applications for many of these topics. This course covers the California State Standards. This course prepares students for AP Calculus. A graphing calculator is required.

## **52450 Advanced Placement Calculus A/B**

UC/CSU approved course. Meets Math and G- Electives requirement.

Grade: 11- 12 Credits: 10 (year-long and weighted) UC/CSU:  (fulfills C & G requirement)

Prerequisite: Grade of B or higher in Math Analysis or Calculus or Integrated Math III/Math III Honors or C or higher in Dual Enrollment Calculus.

An advanced math course that will cover differentiation of functions, integration techniques, application to derivatives, limits, derivatives and integral of exponential trigonometric functions. This course covers the California State Standards. A graphing calculator is required. Student is required to take the AP Exam in May.

## **52455 Advanced Placement Calculus B/C**

UC/CSU Approved Course. Meets Math and G- Electives requirement.

Grade: 11-12 Credits: 10 (year-long and weighted) UC/CSU:  (fulfills C & G requirement)

Prerequisite: A grade of C or higher in AP Calculus A/B.

An advanced math course that will cover differentiation of functions, integration techniques, application to derivatives, limits, derivatives and integral of exponential trigonometric functions. This course covers the California State Standards. A graphing calculator is required. Student is required to take the AP Exam in May.

## **57985 Hartnell Intermediate Algebra (Fall Semester)**

UC/CSU approved course. Meets Math and Electives requirement.

Grades: 11 -12 Credits: 5 semester long course (weighted) UC/CSU:  (fulfills C requirement)

Prerequisite: Grade of A or higher in Integrated Math II or Grade B in Integrated Math II

Honors

Review of elementary algebra plus more advanced problems of factoring, rational expressions, linear and quadratic equations, functions and graphs, systems of equations and inequalities, exponents, radicals, exponential and logarithmic functions, conic sections, sequences, series and applications related to all the functions of intermediate algebra.

## **57987 Hartnell Elementary Statistics (Spring Semester)**

UC/CSU approved course. Meets Math and Electives requirement.

Grades: 11 -12 Credits: 5 semester long course (weighted) UC/CSU:  (fulfills C & G requirement)

Prerequisite: Grade of B or higher in Integrated Math II.

A study of the measures of central tendency, dispersion and position, graphic presentation, sampling, frequency distributions, discrete and continuous probability distributions, expected values, sampling distribution, Central Limit Theorem, sample variability, statistical inferences, confidence intervals, hypothesis testing, tests, Chi-Square tests, analysis of variance (ANOVA), linear correlation and regression analysis, decision making using predictive models, and non parametric tests. This course is primarily for students in business, social sciences, biological sciences, education and humanities. Use of technology, including graphing calculators or computers will be extensively integrated as a tool in the description and analysis of data.

## **Hartnell Pre-Calculus MAT-25 (Fall Semester)**

Meets Math and Electives requirement. UC and CSU transferable credit course.

Grades: 11-12 Credits: 5 semester long course (weighted)

Prerequisite: Grade of B or higher in Math III and HS GPA of 3.0 or higher, unweighted

A study of polynomial functions, rational functions, exponential functions and logarithmic functions, graphing techniques, systems of equations, matrices, determinants, parametric equations. This course is designed to prepare students for Calculus I.

## **Hartnell Trigonometry MAT-24 (Spring Semester)**

Meets Math and Electives requirement. UC and CSU transferable credit course.

Grades: 11-12 Credits: 5 semester long course (weighted)

Prerequisite: Grade of B or higher in Math III and HS GPA of 3.0 or higher, unweighted

Recommended: Successful completion of Hartnell Pre-Calculus MAT-25

Trigonometric functions, inverse trigonometric functions and their graphs, solutions to right and oblique triangles, identities and conditional trigonometric equations, analytic trigonometry, introduction to vectors, and complex numbers. This course, along with MAT-25, is designed to prepare students for Calculus.