

## MATHEMATICS

### **Integrated Math I**

UC/CSU: c

NCAA: yes

**Placement Guidelines: Grade 9**

Integrated Math I is the first course of a three-course sequence including Integrated Math I, Integrated Math II, and Integrated Math III. This course satisfies the California Common Core Standards for Integrated Math I and is intended for all ninth graders. Integrated Math I builds and strengthens students' conceptual knowledge of functions, linear functions, equations, inequalities, sequences, basic exponential functions, systems of linear equations, systems of linear inequalities, one variable descriptive statistics, correlation and residuals, analyzing categorical data, mathematical modeling, and both coordinate and transformational geometries.

### **Integrated Math 2**

UC/CSU: c

NCAA: yes

**Placement Guidelines: Grades 9 - 10**

Integrated Math 2 is the second course of a three-course sequence including Integrated Math 1, Integrated Math 2, and Integrated Math 3. This course satisfies the California Common Core Standards for Integrated Math 2. For the Integrated Math 2 course, students continue to develop algebra and geometry skills through engaging and real life applications. Students will build off of the standards they mastered in Integrated Math 1 building on geometry and algebra skills. Students will demonstrate abilities to reason logically and to understand and apply mathematical processes and concepts using algebraic operations, geometry topics with spatial sense, data analysis, and probability.

### **Integrated Math 2 Honors**

UC/CSU: c

NCAA: yes

**Placement Guidelines: Grades 9 - 10**

Integrated Math 2 Honor is the second course of a three-course sequence including Integrated Math 1, Integrated Math 2, and Integrated Math 3. This course satisfies the California Common Core Standards for Integrated Math 2 Honors. For the Integrated Math 2 Honors course, students continue to develop algebra and geometry skills through engaging and real life applications. Students will build off of the standards they mastered in Integrated Math 1 building on geometry and algebra skills. Students will demonstrate abilities to reason logically and to understand and apply mathematical processes and concepts using algebraic operations, geometry topics with spatial sense, data analysis and probability. The honors series is designed to help students reach the AP Calculus courses.

# AYALA HIGH SCHOOL COURSE DESCRIPTIONS

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### **Integrated Math 3**

**UC/CSU:** c

**NCAA:** yes

**Placement Guidelines:** Grades 10 -11

Integrated Math 3 is the third course of a three-course series which includes all of the common core state standards. It builds and strengthens students' conceptual knowledge of tools of geometry, similarity through transformations, symmetry, congruence through transformations, trigonometry, quadratic functions, polynomials and quadratics functions, and their inverses. Integrated Math 3 also includes linear relations and functions, systems of equations, polynomials and their functions, radical functions and relations, exponential and logarithmic functions, and a continued study of statistics.

### **Integrated Math 3 Honors**

**UC/CSU:** c

**NCAA:** yes

**Placement Guidelines:** Grades 10 - 11

Integrated Mathematics 3 Honors is the third course in a three-course series which includes all of the Common Core State Standards from Integrated Mathematics 2 Honors. It builds and strengthens students' conceptual knowledge of tools of geometry, similarity through transformations, symmetry, congruence through transformations and trigonometry. Integrated Mathematics 3 Honors also includes linear relations and functions, quadratic functions, systems of equations, polynomial functions, inverse functions, radical functions and relations, exponential and logarithmic functions, and a continued study of statistics.

### **Probability and Statistics**

**UC/CSU:** c

**NCAA:** yes

**Placement Guidelines:** Grades 10 – 12

The curriculum for this course is designed to acquaint the student with the basic ideas and language of statistics including such topics as: descriptive statistics, correlation and regression, basic experimental design, elementary probability, binomial and normal distributions, and estimation and test of hypotheses. Mastery of this academic content will provide students with a solid foundation in probability and facility in processing statistical information.

### **Trigonometry / Pre-Calculus**

**UC/CSU:** c

**NCAA:** yes

**Placement Guidelines:** Grades 10 -12

Trigonometry combines many of the algebraic, geometric, and trigonometric techniques needed to prepare students for the study of calculus and strengthens their understanding of problems and mathematical reasoning in solving problems. This course takes a functional approach towards those topics. Students learn the techniques of matrix

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manipulation so they can solve systems of linear equations in any number of variables. The trigonometry functions studied are defined geometrically, rather than in terms of algebraic equations. Students must understand the concepts of trigonometric functions and have the ability to prove basic trigonometric identities. This course incorporates a combination of the California State Content Standards in Mathematical Analysis, Linear Algebra, Trigonometry, and Probability and Statistics.

### **Calculus AB Advanced Placement**

**UC/CSU: c**

**NCAA: yes**

**Placement Guidelines: Grades 11-12**

Calculus AB will cover topics in differential and integral calculus. This course in mathematics consists of a full and intensive academic year of work in the calculus of functions of a single variable. The courses emphasize a multi-representational approach to calculus, with concepts, results, and problems being expressed graphically, numerically, analytically, and verbally. The connections among these representations also are important. Technology should be used regularly by students and teachers to reinforce the relationships among the multiple representations of functions, to confirm written work, to implement experimentation, and to assist in interpreting results. Through the use of the unifying themes of derivatives, integrals, limits, approximation, and applications and modeling, the course becomes a cohesive whole rather than a collection of unrelated topics. These themes are developed using all the functions listed in the prerequisites. College Board prerequisites for AP Calculus AB includes successful completion of Math 1, Math 2 Math 3, and Pre-Calculus. Ayala's Math 2H and Math 3H condenses Math 2, Math 3 and Pre-Calculus into two calendar years.

### **Calculus BC Advanced Placement**

**UC/CSU: c**

**NCAA: yes**

**Placement Guidelines: Grades 11-12**

Calculus BC will cover topics in differential and integral calculus. This course in mathematics consists of a full and intensive academic year of work in the calculus of functions of a single variable. The courses emphasize a multi-representational approach to calculus, with concepts, results, and problems being expressed graphically, numerically, analytically, and verbally. The connections among these representations also are important. Technology should be used regularly by students and teachers to reinforce the relationships among the multiple representations of functions, to confirm written work, to implement experimentation, and to assist in interpreting results. Through the use of the unifying themes of derivatives, integrals, limits, approximation, and applications and modeling, the course becomes a cohesive whole rather than a collection of unrelated topics. These themes are developed using all the functions listed in the prerequisites. Calculus BC is an extension of Calculus AB rather than an enhancement; common topics require a similar depth of understanding. Both courses are intended to be challenging and demanding. The topic outline for Calculus BC includes all Calculus AB topics.

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### Statistics Advanced Placement

UC/CSU: c

NCAA: yes

Placement Guidelines: Grades 10-12

The AP Statistics course introduces students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. There are four themes evident in the content, skills, and assessment in the AP Statistics course: exploring data, sampling and experimentation, probability and simulation, and statistical inference. Students use technology, investigations, problem solving, and writing as they build conceptual understanding. The AP Statistics course is equivalent to a one-semester, introductory, non-calculus-based college course in statistics. The AP Statistics course is an excellent option for any secondary school student who has successfully completed a second-year course in algebra and who possesses sufficient mathematical maturity and quantitative reasoning ability. Because second-year algebra is the prerequisite course, AP Statistics is usually taken in either the junior or senior year. Decisions about whether to take AP Statistics and when to take it depend on a student's plans:

- Students planning to take a science course in their senior year will benefit greatly from taking AP Statistics their junior year.
- For students who would otherwise take no mathematics in their senior year, AP Statistics allows them to continue to develop their quantitative skills.
- Students who wish to leave open the option for taking calculus in college should include precalculus in their high school program and perhaps take AP Statistics concurrently with precalculus.
- Students with the appropriate mathematical background are encouraged to take both AP Statistics and AP Calculus in high school.