

Course: 5012020 Mathematics - Grade Kindergarten

## GENERAL INFORMATION

Course Number: 5012020  
Course Title: Mathematics - Grade Kindergarten  
Abbreviated Title: MATH GRADE K  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades PreK to 5 Education Courses » Subject: Mathematics » SubSubject: General Mathematics »  
Number of Credits: NA  
Course Length: Year  
Course Type: Core  
Course Level: NA  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

MACC.K In Kindergarten, instructional time should focus on two critical areas: (1) representing, relating, and operating on whole numbers, initially with sets of objects; (2) describing shapes and space. More learning time in Kindergarten should be devoted to number than to other topics.

(1) Students use numbers, including written numerals, to represent quantities and to solve quantitative problems, such as counting objects in a set; counting out a given number of objects; comparing sets or numerals; and modeling simple joining and separating situations with sets of objects, or eventually with equations such as  $5 + 2 = 7$  and  $7 - 2 = 5$ . (Kindergarten students should see addition and subtraction equations, and student writing of equations in kindergarten is encouraged, but it is not required.) Students choose, combine, and apply effective strategies for answering quantitative questions, including quickly recognizing the cardinalities of small sets of objects, counting and producing sets of given sizes, counting the number of objects in combined sets, or counting the number of objects that remain in a set after some are taken away.

(2) Students describe their physical world using geometric ideas (e.g., shape, orientation, spatial relations) and vocabulary. They identify, name, and describe basic two-dimensional shapes, such as squares, triangles, circles, rectangles, and hexagons, presented in a variety of

ways (e.g., with different sizes and orientations), as well as three-dimensional shapes such as cubes, cones, cylinders, and spheres. They use basic shapes and spatial reasoning to model objects in their environment and to construct more complex shapes.

**MACC.K12.MP**

**Mathematical Practices**

MACC.K12.MP.1

Make sense of problems and persevere in solving them

MACC.K12.MP.2

Reason abstractly and quantitatively

MACC.K12.MP.3

Construct viable arguments and critique the reasoning of others

MACC.K12.MP.4

Model with mathematics

MACC.K12.MP.5

Use appropriate tools strategically

MACC.K12.MP.6

Attend to precision

MACC.K12.MP.7

Look for and make use of structure

MACC.K12.MP.8

Look for and express regularity in repeated reasoning

**MACC.K.CC**

**Counting and Cardinality**

**MACC.K.CC.1**

**Know number names and the count sequence.**

MACC.K.CC.1.1

Count to 100 by ones and by tens.

MACC.K.CC.1.2

Count forward beginning from a given number within the known sequence (instead of having to begin at 1).

MACC.K.CC.1.3

Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).

**MACC.K.CC.2**

**Count to tell the number of objects.**

MACC.K.CC.2.4

Understand the relationship between numbers and quantities; connect counting to cardinality.

MACC.K.CC.2.4a

When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.

MACC.K.CC.2.4b

Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.

MACC.K.CC.2.4c

Understand that each successive number name refers to a quantity that is one larger.

MACC.K.CC.2.5

Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10

things in a scattered configuration; given a number from 1–20, count out that many objects.

**MACC.K.CC.3**  
MACC.K.CC.3.6

**Compare numbers.**

Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies. Note: Include groups with up to ten objects.

MACC.K.CC.3.7

Compare two numbers between 1 and 10 presented as written numerals.

**MACC.K.OA**  
**MACC.K.OA.1**

**Operations and Algebraic Thinking**

**Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.**

MACC.K.OA.1.1

Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. Note: Drawings need not show details, but should show the mathematics in the problem. (This applies wherever drawings are mentioned in the Standards.)

MACC.K.OA.1.2

Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.

MACC.K.OA.1.3

Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g.,  $5 = 2 + 3$  and  $5 = 4 + 1$ ).

MACC.K.OA.1.4

For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.

MACC.K.OA.1.5

Fluently add and subtract within 5.

**MACC.K.NBT**  
**MACC.K.NBT.1**  
MACC.K.NBT.1.1

**Number and Operations in Base Ten**

**Work with numbers 11–19 to gain foundations for place value.**

Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g.,  $18 = 10 + 8$ ); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

**MACC.K.MD**  
**MACC.K.MD.1**  
MACC.K.MD.1.1

**Measurement and Data**

**Describe and compare measurable attributes.**

Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.

MACC.K.MD.1.2

Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. *For example, directly compare the heights of two children and describe one child as taller/shorter.*

<p><b>MACC.K.MD.2</b> MACC.K.MD.2.3</p>	<p><b>Classify objects and count the number of objects in each category.</b> Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. Note: Limit category counts to be less than or equal to 10.</p>
<p><b>MACC.K.G</b> <b>MACC.K.G.1</b></p>	<p><b>Geometry</b> <b>Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).</b></p>
<p>MACC.K.G.1.1</p>	<p>Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as <i>above, below, beside, in front of, behind, and next to</i>.</p>
<p>MACC.K.G.1.2 MACC.K.G.1.3</p>	<p>Correctly name shapes regardless of their orientations or overall size. Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”).</p>
<p><b>MACC.K.G.2</b> MACC.K.G.2.4</p>	<p><b>Analyze, compare, create, and compose shapes.</b> Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/“corners”) and other attributes (e.g., having sides of equal length).</p>
<p>MACC.K.G.2.5</p>	<p>Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.</p>
<p>MACC.K.G.2.6</p>	<p>Compose simple shapes to form larger shapes. <i>For example, “Can you join these two triangles with full sides touching to make a rectangle?”</i></p>

Course: 5012070 Mathematics - Grade Five

## GENERAL INFORMATION

Course Number: 5012070  
Course Title: Mathematics - Grade Five  
Abbreviated Title: MATH GRADE FIVE  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades PreK to 5 Education Courses » Subject: Mathematics » SubSubject: General Mathematics »  
Number of Credits: NA  
Course Length: Year  
Course Type: Core  
Course Level: NA  
Course Status: State Board Approved

## RELATED STANDARDS/BENCHMARKS

MA.5.A.1.1: Describe the process of finding quotients involving multi-digit dividends using models, place value, properties, and the relationship of division to multiplication.

MA.5.A.1.2: Estimate quotients or calculate them mentally depending on the context and numbers involved.

MA.5.A.1.3: Interpret solutions to division situations including those with remainders depending on the context of the problem.

MA.5.A.1.4: Divide multi-digit whole numbers fluently, including solving real-world problems, demonstrating understanding of the standard algorithm and checking the reasonableness of results.

MA.5.A.2.1: Represent addition and subtraction of decimals and fractions with like and unlike denominators using models, place value, or properties.

MA.5.A.2.2: Add and subtract fractions and decimals fluently, and verify the reasonableness of results, including in problem situations.

MA.5.A.2.3: Make reasonable estimates of fraction and decimal sums and differences, and use techniques for rounding.

MA.5.A.2.4: Determine the prime factorization of numbers.

- MA.5.A.4.1: Use the properties of equality to solve numerical and real world situations.
- MA.5.A.4.2: Construct and describe a graph showing continuous data, such as a graph of a quantity that changes over time.
- MA.5.A.6.1: Identify and relate prime and composite numbers, factors, and multiples within the context of fractions.
- MA.5.A.6.2: Use the order of operations to simplify expressions which include exponents and parentheses.
- MA.5.A.6.3: Describe real-world situations using positive and negative numbers.
- MA.5.A.6.4: Compare, order, and graph integers, including integers shown on a number line.
- MA.5.A.6.5: Solve non-routine problems using various strategies including “solving a simpler problem” and “guess, check, and revise”.
- MA.5.G.3.1: Analyze and compare the properties of two-dimensional figures and three-dimensional solids (polyhedra), including the number of edges, faces, vertices, and types of faces.
- MA.5.G.3.2: Describe, define, and determine surface area and volume of prisms by using appropriate units and selecting strategies and tools.
- MA.5.G.5.1: Identify and plot ordered pairs on the first quadrant of the coordinate plane.
- MA.5.G.5.2: Compare, contrast, and convert units of measure within the same dimension (length, mass, or time) to solve problems.
- MA.5.G.5.3: Solve problems requiring attention to approximation, selection of appropriate measuring tools, and precision of measurement.
- MA.5.G.5.4: Derive and apply formulas for areas of parallelograms, triangles, and trapezoids from the area of a rectangle.
- MA.5.S.7.1: Construct and analyze line graphs and double bar graphs.
- MA.5.S.7.2: Differentiate between continuous and discrete data, and determine ways to represent those using graphs and diagrams.

Course: 5012060 Mathematics - Grade Four

## GENERAL INFORMATION

Course Number: 5012060

Course Title: Mathematics - Grade Four

Abbreviated Title: MATH GRADE FOUR

Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades PreK to 5 Education Courses » Subject: Mathematics » SubSubject: General Mathematics »

Number of Credits: NA

Course Length: Year

Course Type: Core

Course Level: NA

Course Status: SBE Approval Pending

Special Notes: Additional content addressed on the Grade 4 NAEP Mathematics assessment includes:

- Solve problems involving conversions within the same measurement system such as conversions involving inches and feet or hours and minutes. (MACC.4.MD.1.1)
- Determine situations in which a highly accurate measurement is important. (MACC.K12.MP.6)
- Describe relative positions of points and lines using the geometric ideas of parallelism or perpendicularity. (MACC.4.G.1.1)
- Explore properties of paths between points.
- Graph or interpret points with whole number or letter coordinates on grids or in the first quadrant of the coordinate plane; construct geometric figures with vertices at points on a coordinate grid.
- Given a set of data or a graph, describe the distribution of data using median, range, or mode.
- Use informal probabilistic thinking to describe chance events (i.e., likely and unlikely, certain and impossible).
- Determine a simple probability from a context that includes a picture; represent the probability of a given outcome using a picture or other graphic and list all possible outcomes of a given situation or event.
- Recognize or describe a relationship in which quantities change proportionally.
- Use simple ratios to describe problem situations.

## RELATED STANDARDS/BENCHMARKS

- MA.4.A.1.1: Use and describe various models for multiplication in problem-solving situations, and demonstrate recall of basic multiplication and related division facts with ease.
- MA.4.A.1.2: Multiply multi-digit whole numbers through four digits fluently, demonstrating understanding of the standard algorithm, and checking for reasonableness of results, including solving real-world problems.
- MA.4.A.2.1: Use decimals through the thousandths place to name numbers between whole numbers.
- MA.4.A.2.2: Describe decimals as an extension of the base-ten number system.
- MA.4.A.2.3: Relate equivalent fractions and decimals with and without models, including locations on a number line.
- MA.4.A.2.4: Compare and order decimals, and estimate fraction and decimal amounts in real-world problems.
- MA.4.A.4.1: Generate algebraic rules and use all four operations to describe patterns, including nonnumeric growing or repeating patterns.
- MA.4.A.4.2: Describe mathematics relationships using expressions, equations, and visual representations.
- MA.4.A.4.3: Recognize and write algebraic expressions for functions with two operations.
- MA.4.A.6.1: Use and represent numbers through millions in various contexts, including estimation of relative sizes of amounts or distances.
- MA.4.A.6.2: Use models to represent division as:
- the inverse of multiplication
  - as partitioning
  - as successive subtraction
- MA.4.A.6.3: Generate equivalent fractions and simplify fractions.
- MA.4.A.6.4: Determine factors and multiples for specified whole numbers.
- MA.4.A.6.5: Relate halves, fourths, tenths, and hundredths to decimals and percents.
- MA.4.A.6.6: Estimate and describe reasonableness of estimates; determine the appropriateness of an estimate versus an exact answer.
- MA.4.G.3.1: Describe and determine area as the number of same-sized units that cover a region in the plane, recognizing that a unit square is the standard unit for measuring area.



- MA.4.G.3.2: Justify the formula for the area of the rectangle "area = base x height".
- MA.4.G.3.3: Select and use appropriate units, both customary and metric, strategies, and measuring tools to estimate and solve real-world area problems.
- MA.4.G.5.1: Classify angles of two-dimensional shapes using benchmark angles ( $45^\circ$ ,  $90^\circ$ ,  $180^\circ$ , and  $360^\circ$ )
- MA.4.G.5.2: Identify and describe the results of translations, reflections, and rotations of 45, 90, 180, 270, and 360 degrees, including figures with line and rotational symmetry.
- MA.4.G.5.3: Identify and build a three-dimensional object from a two-dimensional representation of that object and vice versa.

Course: 5012050 Mathematics - Grade Three

## GENERAL INFORMATION

Course Number: 5012050  
Course Title: Mathematics - Grade Three  
Abbreviated Title: MATH GRADE THREE  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades PreK to 5 Education Courses » Subject: Mathematics » SubSubject: General Mathematics »  
Number of Credits: NA  
Course Length: Year  
Course Type: Core  
Course Level: NA  
Course Status: State Board Approved

## RELATED STANDARDS/BENCHMARKS

MA.3.A.1.1: Model multiplication and division including problems presented in context: repeated addition, multiplicative comparison, array, how many combinations, measurement, and partitioning.

MA.3.A.1.2: Solve multiplication and division fact problems by using strategies that result from applying number properties.

MA.3.A.1.3: Identify, describe, and apply division and multiplication as inverse operations.

MA.3.A.2.1: Represent fractions, including fractions greater than one, using area, set, and linear models.

MA.3.A.2.2: Describe how the size of the fractional part is related to the number of equal sized pieces in the whole.

MA.3.A.2.3: Compare and order fractions, including fractions greater than one, using models and strategies.

MA.3.A.2.4: Use models to represent equivalent fractions, including fractions greater than 1, and identify representations of equivalence.

MA.3.A.4.1: Create, analyze, and represent patterns and relationships using words, variables, tables, and graphs.

- MA.3.A.6.1: Represent, compute, estimate, and solve problems using numbers through hundred thousands.
- MA.3.A.6.2: Solve non-routine problems by making a table, chart, or list and searching for patterns.
- MA.3.G.3.1: Describe, analyze, compare, and classify two-dimensional shapes using sides and angles - including acute, obtuse, and right angles - and connect these ideas to the definition of shapes.
- MA.3.G.3.2: Compose, decompose, and transform polygons to make other polygons, including concave and convex polygons with three, four, five, six, eight, or ten sides.
- MA.3.G.3.3: Build, draw, and analyze two-dimensional shapes from several orientations in order to examine and apply congruence and symmetry.
- MA.3.G.5.1: Select appropriate units, strategies, and tools to solve problems involving perimeter.
- MA.3.G.5.2: Measure objects using fractional parts of linear units such as  $\frac{1}{2}$ ,  $\frac{1}{4}$ , and  $\frac{1}{10}$ .
- MA.3.G.5.3: Tell time to the nearest minute and to the nearest quarter hour, and determine the amount of time elapsed.
- MA.3.S.7.1: Construct and analyze frequency tables, bar graphs, pictographs, and line plots from data, including data collected through observations, surveys, and experiments.

Course: 5012040 Mathematics - Grade Two

## GENERAL INFORMATION

Course Number: 5012040  
Course Title: Mathematics - Grade Two  
Abbreviated Title: MATH GRADE TWO  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades PreK to 5 Education Courses » Subject: Mathematics » SubSubject: General Mathematics »  
Number of Credits: NA  
Course Length: Year  
Course Type: Core  
Course Level: NA  
Course Status: State Board Approved

## RELATED STANDARDS/BENCHMARKS

MA.2.A.1.1: Identify relationships between the digits and their place values through the thousands, including counting by tens and hundreds.

MA.2.A.1.2: Identify and name numbers through thousands in terms of place value, and apply this knowledge to expanded notation.

MA.2.A.1.3: Compare and order multi-digit numbers through the thousands.

MA.2.A.2.1: Recall basic addition and related subtraction facts.

MA.2.A.2.2: Add and subtract multi-digit whole numbers through three digits with fluency by using a variety of strategies, including invented and standard algorithms and explanations of those procedures.

MA.2.A.2.3: Estimate solutions to multi-digit addition and subtraction problems through three digits.

MA.2.A.2.4: Solve addition and subtraction problems that involve measurement and geometry.

MA.2.A.4.1: Extend number patterns to build a foundation for understanding multiples and factors – for example, skip counting by 2's, 5's, 10's.

MA.2.A.4.2: Classify numbers as odd or even and explain why.

- MA.2.A.4.3: Generalize numeric and non-numeric patterns using words and tables.
- MA.2.A.4.4: Describe and apply equality to solve problems, such as in balancing situations.
- MA.2.A.4.5: Recognize and state rules for functions that use addition and subtraction.
- MA.2.A.6.1: Solve problems that involve repeated addition.
- MA.2.G.3.1: Estimate and use standard units, including inches and centimeters, to partition and measure lengths of objects.
- MA.2.G.3.2: Describe the inverse relationship between the size of a unit and number of units needed to measure a given object.
- MA.2.G.3.3: Apply the Transitive Property when comparing lengths of objects.
- MA.2.G.3.4: Estimate, select an appropriate tool, measure, and/or compute lengths to solve problems.
- MA.2.G.5.1: Use geometric models to demonstrate the relationships between wholes and their parts as a foundation to fractions.
- MA.2.G.5.2: Identify time to the nearest hour and half hour.
- MA.2.G.5.3: Identify, combine, and compare values of money in cents up to \$1 and in dollars up to \$100, working with a single unit of currency.
- MA.2.G.5.4: Measure weight/mass and capacity/volume of objects. Include the use of the appropriate unit of measure and their abbreviations including cups, pints, quarts, gallons, ounces (oz), pounds (lbs), grams (g), kilograms (kg), milliliters (mL) and liters (L).

Course: 5012030 Mathematics - Grade One

## GENERAL INFORMATION

Course Number: 5012030  
Course Title: Mathematics - Grade One  
Abbreviated Title: MATH GRADE ONE  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades PreK to 5 Education Courses » Subject: Mathematics » SubSubject: General Mathematics »  
Number of Credits: NA  
Course Length: Year  
Course Type: Core  
Course Level: NA  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

MACC.1 In Grade 1, instructional time should focus on four critical areas: (1) developing understanding of addition, subtraction, and strategies for addition and subtraction within 20; (2) developing understanding of whole number relationships and place value, including grouping in tens and ones; (3) developing understanding of linear measurement and measuring lengths as iterating length units; and (4) reasoning about attributes of, and composing and decomposing geometric shapes.

(1) Students develop strategies for adding and subtracting whole numbers based on their prior work with small numbers. They use a variety of models, including discrete objects and length-based models (e.g., cubes connected to form lengths), to model add-to, take-from, put-together, take-apart, and compare situations to develop meaning for the operations of addition and subtraction, and to develop strategies to solve arithmetic problems with these operations. Students understand connections between counting and addition and subtraction (e.g., adding two is the same as counting on two). They use properties of addition to add whole numbers and to create and use increasingly sophisticated strategies based on these properties (e.g., “making tens”) to solve addition and subtraction problems within 20. By comparing a variety of solution strategies, children build their understanding of the relationship between addition and subtraction.

- (2) Students develop, discuss, and use efficient, accurate, and generalizable methods to add within 100 and subtract multiples of 10. They compare whole numbers (at least to 100) to develop understanding of and solve problems involving their relative sizes. They think of whole numbers between 10 and 100 in terms of tens and ones (especially recognizing the numbers 11 to 19 as composed of a ten and some ones). Through activities that build number sense, they understand the order of the counting numbers and their relative magnitudes.
- (3) Students develop an understanding of the meaning and processes of measurement, including underlying concepts such as iterating (the mental activity of building up the length of an object with equal-sized units) and the transitivity principle for indirect measurement. Note: Students should apply the principle of transitivity of measurement to make indirect comparisons, but they need not use this technical term.
- (4) Students compose and decompose plane or solid figures (e.g., put two triangles together to make a quadrilateral) and build understanding of part-whole relationships as well as the properties of the original and composite shapes. As they combine shapes, they recognize them from different perspectives and orientations, describe their geometric attributes, and determine how they are alike and different, to develop the background for measurement and for initial understandings of properties such as congruence and symmetry.

**MACC.K12.MP**  
MACC.K12.MP.1

**Mathematical Practices**  
Make sense of problems and persevere in solving them

MACC.K12.MP.2

Reason abstractly and quantitatively

MACC.K12.MP.3

Construct viable arguments and critique the reasoning of others

MACC.K12.MP.4

Model with mathematics

MACC.K12.MP.5

Use appropriate tools strategically

MACC.K12.MP.6

Attend to precision

MACC.K12.MP.7

Look for and make use of structure

MACC.K12.MP.8

Look for and express regularity in repeated reasoning

**MACC.1.OA**  
**MACC.1.OA.1**  
MACC.1.OA.1.1

**Operations and Algebraic Thinking**  
**Represent and solve problems involving addition and subtraction.**  
Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. Note: See Table 1.

- MACC.1.OA.1.2 Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
- MACC.1.OA.2 Understand and apply properties of operations and the relationship between addition and subtraction.
- MACC.1.OA.2.3 Apply properties of operations as strategies to add and subtract.  
*Examples: If  $8 + 3 = 11$  is known, then  $3 + 8 = 11$  is also known. (Commutative property of addition.) To add  $2 + 6 + 4$ , the second two numbers can be added to make a ten, so  $2 + 6 + 4 = 2 + 10 = 12$ . (Associative property of addition.) Note: Students need not use formal terms for these properties.*
- MACC.1.OA.2.4 Understand subtraction as an unknown-addend problem. *For example, subtract  $10 - 8$  by finding the number that makes 10 when added to 8.*
- MACC.1.OA.3 Add and subtract within 20.**
- MACC.1.OA.3.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).
- MACC.1.OA.3.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g.,  $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$ ); decomposing a number leading to a ten (e.g.,  $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$ ); using the relationship between addition and subtraction (e.g., knowing that  $8 + 4 = 12$ , one knows  $12 - 8 = 4$ ); and creating equivalent but easier or known sums (e.g., adding  $6 + 7$  by creating the known equivalent  $6 + 6 + 1 = 12 + 1 = 13$ ).
- MACC.1.OA.4 Work with addition and subtraction equations.**
- MACC.1.OA.4.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. *For example, which of the following equations are true and which are false?  $6 = 6$ ,  $7 = 8 - 1$ ,  $5 + 2 = 2 + 5$ ,  $4 + 1 = 5 + 2$ .*
- MACC.1.OA.4.8 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations  $8 + ? = 11$ ,  $5 = \quad - 3$ ,  $6 + 6 = \quad$ .*
- MACC.1.NBT Number and Operations in Base Ten**
- MACC.1.NBT.1 Extend the counting sequence.**
- MACC.1.NBT.1.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
- MACC.1.NBT.2 Understand place value.



MACC.1.NBT.2.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:

MACC.1.NBT.2.2a 10 can be thought of as a bundle of ten ones — called a “ten.”

MACC.1.NBT.2.2b The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.

MACC.1.NBT.2.2c The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).

MACC.1.NBT.2.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols  $>$ ,  $=$ , and  $<$ .

**MACC.1.NBT.3 Use place value understanding and properties of operations to add and subtract.**

MACC.1.NBT.3.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

MACC.1.NBT.3.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

MACC.1.NBT.3.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

**MACC.1.MD Measurement and Data**

**MACC.1.MD.1 Measure lengths indirectly and by iterating length units.**

MACC.1.MD.1.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object.

MACC.1.MD.1.2 Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.*

**MACC.1.MD.2 Tell and write time.**

MACC.1.MD.2.3 Tell and write time in hours and half-hours using analog and digital clocks.

**MACC.1.MD.3**  
MACC.1.MD.3.4

**Represent and interpret data.**

Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

**MACC.1.G**  
**MACC.1.G.1**  
MACC.1.G.1.1

**Geometry**

**Reason with shapes and their attributes.**

Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.

MACC.1.G.1.2

Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. Note: Students do not need to learn formal names such as "right rectangular prism."

MACC.1.G.1.3

Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

**Table 1**

	Result Unknown	Change Unknown	Start Unknown
Add To	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now?  $2 + 3 = ?$	Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two?  $2 + ? = 5$	Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before?  $? + 3 = 5$
Take From	Five apples were on the table. I ate two apples. How many apples are on the table now?  $5 - 2 = ?$	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat?  $5 - ? = 3$	Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before?  $? - 2 = 3$
	Total Unknown	Addend Unknown	Both Addends Unknown <sup>1</sup>
Put Together/ Take Apart <sup>2</sup>	Three red apples and two green apples are on the table. How many apples are on the table?  $3 + 2 = ?$	Five apples are on the table. Three are red and the rest are green. How many apples are green?  $3 + ? = 5, 5 - 3 = ?$	Grandma has five flowers. How many can she put in her red vase and how many in her blue vase?  $5 = 0 + 5, 5 = 5 + 0$ $5 = 1 + 4, 5 = 4 + 1$ $5 = 2 + 3, 5 = 3 + 2$
	Difference Unknown	Bigger Unknown	Smaller Unknown
Compare <sup>3</sup>	("How many more?" version): Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy?  ("How many fewer?" version): Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie?  $2 + ? = 5, 5 - 2 = ?$	(Version with "more"): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have?  (Version with "fewer"): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have?  $2 + 3 = ?, 3 + 2 = ?$	(Version with "more"): Julie has three more apples than Lucy. Julie has five apples. How many apples does Lucy have?  (Version with "fewer"): Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have?  $5 - 3 = ?, ? + 3 = 5$

1-These take apart situations can be used to show all the decompositions of a given number. The associated equations, which have the total on the left of the equal sign, help children understand that the = sign does not always mean makes or results in but always does mean is the same number as.

2-Either addend can be unknown, so there are three variations of these problem situations. Both Addends Unknown is a productive extension of this basic situation, especially for small numbers less than or equal to 10.

3-For the Bigger Unknown or Smaller Unknown situations, one version directs the correct operation (the version using more for the bigger unknown and using less for the smaller unknown). The other versions are more difficult.

Course: 1205080 M/J Pre-Algebra, Advanced

## GENERAL INFORMATION

Course Number: 1205080  
Course Title: M/J Pre-Algebra, Advanced  
Abbreviated Title: M/J PRE-ALG, ADV  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 6 to 8 Education Courses » Subject: Mathematics » SubSubject: General Mathematics »

Course Length: Year  
Course Type: Core  
Course Level: 3  
Course Status: SBE Approval Pending  
Special Notes: Additional content addressed on the Grade 8 NAEP Mathematics assessment includes:

- Draw or sketch from a written description polygons, circles, or semicircles. (MACC.7.G.1.2; include circles and semicircles)
- Represent or describe a three-dimensional situation in a two-dimensional drawing from different views. (MACC.6.G.1.4)
- Demonstrate an understanding about the two- and three-dimensional shapes in our world through identifying, drawing, modeling, building, or taking apart. (MACC.6.G.1.4, MACC.7.G.1.3, MACC.7.G.2.6)
- Describe or analyze properties and relationships of parallel or intersecting lines. (MACC.8.G.1.5)
- Visualize or describe the cross section of a solid. (MACC.7.G.1.3)
- Represent geometric figures using rectangular coordinates on a plane. (MACC.6.G.1.3)
- Describe how mean, median, mode, range, or interquartile ranges relate to distribution shape. (MACC.6.SP.2.5c)
- Identify outliers and determine their effect on mean, median, mode, and range. (MACC.8.SP.1.1)
- Using appropriate statistical measures, compare two or more data sets describing the same characteristic for two different populations for subset of the same population. (MACC.7.SP.2.3, MACC.7.SP.2.4)
- Given a sample, identify possible sources of bias in sampling. (MACC.7.SP.1.1)
- Distinguish between a random and nonrandom sample. (MACC.7.SP.1.1)
- Evaluate the design of an experiment. (MACC.7.SP.1.2)
- Determine the theoretical probability of simple and compound events in familiar contexts. (MACC.7.SP.3.8a)
- Estimate the probability of simple and compound events through experimentation or simulation. (MACC.7.SP.3.8)
- Use theoretical probability to evaluate or predict experimental outcomes. (MACC.7.SP.3.6, MACC.SP.3.7)

- Describe relative positions of points and lines using the geometric ideas of midpoint, points on common line through a common point, parallelism, or perpendicularity.
- Describe the intersection of two or more geometric figures in the plane (e.g., intersection of a circle and a line).
- Make and test a geometric conjecture about regular polygons.

## RELATED STANDARDS/BENCHMARKS

### **LACC.68.RST.2 Craft and Structure**

LACC.68.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

### **LACC.68.RST.3 Integration of Knowledge and Ideas**

LACC.68.RST.3.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

## NEXT GENERATION SUNSHINE STATE STANDARDS

- MA.8.A.1.1: Create and interpret tables, graphs, and models to represent, analyze, and solve problems related to linear equations, including analysis of domain, range, and the difference between discrete and continuous data.
- MA.8.A.1.2: Interpret the slope and the x- and y-intercepts when graphing a linear equation for a real-world problem.
- MA.8.A.1.3: Use tables, graphs, and models to represent, analyze, and solve real-world problems related to systems of linear equations.
- MA.8.A.1.4: Identify the solution to a system of linear equations using graphs.
- MA.8.A.1.5: Translate among verbal, tabular, graphical, and algebraic representations of linear functions.
- MA.8.A.1.6: Compare the graphs of linear and non-linear functions for real-world situations.
- MA.8.A.4.1: Solve literal equations for a specified variable.
- MA.8.A.4.2: Solve and graph one- and two-step inequalities in one variable.
- MA.8.A.6.1: Use exponents and scientific notation to write large and small numbers and vice versa and to solve problems.
- MA.8.A.6.2: Make reasonable approximations of square roots and mathematical expressions that include square roots, and use them to estimate solutions

to problems and to compare mathematical expressions involving real numbers and radical expressions.

- MA.8.A.6.3: Simplify real number expressions using the laws of exponents.
- MA.8.A.6.4: Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, and irrational numbers) using multi-step and real world problems.
- MA.8.G.2.1: Use similar triangles to solve problems that include height and distances.
- MA.8.G.2.2: Classify and determine the measure of angles, including angles created when parallel lines are cut by transversals.
- MA.8.G.2.3: Demonstrate that the sum of the angles in a triangle is 180-degrees and apply this fact to find unknown measure of angles and the sum of angles in polygons.
- MA.8.G.2.4: Validate and apply Pythagorean Theorem to find distances in real world situations or between points in the coordinate plane.
- MA.8.G.5.1: Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)) and dimensions including temperature, area, volume, and derived units to solve problems.
- MA.8.S.3.1: Select, organize and construct appropriate data displays, including box and whisker plots, scatter plots, and lines of best fit to convey information and make conjectures about possible relationships.
- MA.8.S.3.2: Determine and describe how changes in data values impact measures of central tendency.
- MA.912.A.1.1: Know equivalent forms of real numbers (including integer exponents and radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers).
- MA.912.A.1.2: Compare real number expressions.
- MA.912.A.3.1: Solve linear equations in one variable that include simplifying algebraic expressions.
- MA.912.A.3.2: Identify and apply the distributive, associative, and commutative properties of real numbers and the properties of equality.
- MA.912.A.3.5: Symbolically represent and solve multi-step and real-world applications that involve linear equations and inequalities.
- MA.912.A.4.1: Simplify monomials and monomial expressions using the laws of integral exponents.
- MA.912.A.4.2: Add, subtract, and multiply polynomials.

Course: 1205070 M/J Pre-Algebra

## GENERAL INFORMATION

Course Number: 1205070  
Course Title: M/J Pre-Algebra  
Abbreviated Title: M/J PRE-ALG  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 6 to 8 Education Courses » Subject: Mathematics » SubSubject: General Mathematics »

Course Length: Year  
Course Type: Core  
Course Level: 2  
Course Status: SBE Approval Pending  
Special Notes: Additional content addressed on the Grade 8 NAEP Mathematics assessment includes:

- Draw or sketch from a written description polygons, circles, or semicircles. (MACC.7.G.1.2; include circles and semicircles)
- Represent or describe a three-dimensional situation in a two-dimensional drawing from different views. (MACC.6.G.1.4)
- Demonstrate an understanding about the two- and three-dimensional shapes in our world through identifying, drawing, modeling, building, or taking apart. (MACC.6.G.1.4, MACC.7.G.1.3, MACC.7.G.2.6)
- Describe or analyze properties and relationships of parallel or intersecting lines. (MACC.8.G.1.5)
- Visualize or describe the cross section of a solid. (MACC.7.G.1.3)
- Represent geometric figures using rectangular coordinates on a plane. (MACC.6.G.1.3)
- Describe how mean, median, mode, range, or interquartile ranges relate to distribution shape. (MACC.6.SP.2.5c)
- Identify outliers and determine their effect on mean, median, mode, and range. (MACC.8.SP.1.1)
- Using appropriate statistical measures, compare two or more data sets describing the same characteristic for two different populations for subset of the same population. (MACC.7.SP.2.3, MACC.7.SP.2.4)
- Given a sample, identify possible sources of bias in sampling. (MACC.7.SP.1.1)
- Distinguish between a random and nonrandom sample. (MACC.7.SP.1.1)
- Evaluate the design of an experiment. (MACC.7.SP.1.2)
- Determine the theoretical probability of simple and compound events in familiar contexts. (MACC.7.SP.3.8a)
- Estimate the probability of simple and compound events through experimentation or simulation. (MACC.7.SP.3.8)
- Use theoretical probability to evaluate or predict experimental outcomes. (MACC.7.SP.3.6, MACC.SP.3.7)

- Describe relative positions of points and lines using the geometric ideas of midpoint, points on common line through a common point, parallelism, or perpendicularity.
- Describe the intersection of two or more geometric figures in the plane (e.g., intersection of a circle and a line).
- Make and test a geometric conjecture about regular polygons.

## RELATED STANDARDS/BENCHMARKS

<b>LACC.68.RST.2</b>	<b>Craft and Structure</b>
LACC.68.RST.2.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.
<b>LACC.68.RST.3</b>	<b>Integration of Knowledge and Ideas</b>
LACC.68.RST.3.7	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.8.A.1.1:	Create and interpret tables, graphs, and models to represent, analyze, and solve problems related to linear equations, including analysis of domain, range, and the difference between discrete and continuous data.
MA.8.A.1.2:	Interpret the slope and the x- and y-intercepts when graphing a linear equation for a real-world problem.
MA.8.A.1.3:	Use tables, graphs, and models to represent, analyze, and solve real-world problems related to systems of linear equations.
MA.8.A.1.4:	Identify the solution to a system of linear equations using graphs.
MA.8.A.1.5:	Translate among verbal, tabular, graphical, and algebraic representations of linear functions.
MA.8.A.1.6:	Compare the graphs of linear and non-linear functions for real-world situations.
MA.8.A.4.1:	Solve literal equations for a specified variable.
MA.8.A.4.2:	Solve and graph one- and two-step inequalities in one variable.
MA.8.A.6.1:	Use exponents and scientific notation to write large and small numbers and vice versa and to solve problems.
MA.8.A.6.2:	Make reasonable approximations of square roots and mathematical expressions that include square roots, and use them to estimate solutions to problems and to compare mathematical expressions involving real numbers and radical expressions.



- MA.8.A.6.3: Simplify real number expressions using the laws of exponents.
- MA.8.A.6.4: Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, and irrational numbers) using multi-step and real world problems.
- MA.8.G.2.1: Use similar triangles to solve problems that include height and distances.
- MA.8.G.2.2: Classify and determine the measure of angles, including angles created when parallel lines are cut by transversals.
- MA.8.G.2.3: Demonstrate that the sum of the angles in a triangle is 180-degrees and apply this fact to find unknown measure of angles and the sum of angles in polygons.
- MA.8.G.2.4: Validate and apply Pythagorean Theorem to find distances in real world situations or between points in the coordinate plane.
- MA.8.G.5.1: Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)) and dimensions including temperature, area, volume, and derived units to solve problems.
- MA.8.S.3.1: Select, organize and construct appropriate data displays, including box and whisker plots, scatter plots, and lines of best fit to convey information and make conjectures about possible relationships.
- MA.8.S.3.2: Determine and describe how changes in data values impact measures of central tendency.

Course: 1205050 M/J Mathematics 2, Advanced

## GENERAL INFORMATION

Course Number: 1205050  
Course Title: M/J Mathematics 2, Advanced  
Abbreviated Title: M/J MATH 2, ADV  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 6 to 8 Education Courses » Subject: Mathematics » SubSubject: General Mathematics »  
Course Length: Year  
Course Type: Core  
Course Level: 3  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.68.RST.2 Craft and Structure**  
LACC.68.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

**LACC.68.RST.3 Integration of Knowledge and Ideas**  
LACC.68.RST.3.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.7.A.1.1: Distinguish between situations that are proportional or not proportional, and use proportions to solve problems.

MA.7.A.1.2: Solve percent problems, including problems involving discounts, simple interest, taxes, tips, and percents of increase or decrease.

MA.7.A.1.3: Solve problems involving similar figures.

MA.7.A.1.4: Graph proportional relationships and identify the unit rate as the slope of the related linear function.

MA.7.A.1.5: Distinguish direct variation from other relationships, including inverse variation.

MA.7.A.1.6: Apply proportionality to measurement in multiple contexts, including scale drawings and constant speed.

MA.7.A.5.1: Express rational numbers as terminating or repeating decimals.

- MA.7.G.2.1: Justify and apply formulas for surface area and volume of pyramids, prisms, cylinders, and cones.
- MA.7.G.4.1: Determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures, and apply these relationships to solve problems.
- MA.7.G.4.2: Predict the results of transformations, and draw transformed figures with and without the coordinate plane.
- MA.7.G.4.3: Identify and plot ordered pairs in all four quadrants of the coordinate plane.
- MA.7.P.7.1: Determine the outcome of an experiment and predict which events are likely or unlikely, and if the experiment is fair or unfair.
- MA.7.P.7.2: Determine, compare, and make predictions based on experimental or theoretical probability of independent or dependent events.
- MA.7.S.6.1: Evaluate the reasonableness of a sample to determine the appropriateness of generalizations made about the population.
- MA.7.S.6.2: Construct and analyze histograms, stem-and-leaf plots, and circle graphs.
- MA.8.A.1.1: Create and interpret tables, graphs, and models to represent, analyze, and solve problems related to linear equations, including analysis of domain, range, and the difference between discrete and continuous data.
- MA.8.A.1.2: Interpret the slope and the x- and y-intercepts when graphing a linear equation for a real-world problem.
- MA.8.A.1.6: Compare the graphs of linear and non-linear functions for real-world situations.
- MA.8.A.4.2: Solve and graph one- and two-step inequalities in one variable.
- MA.8.A.6.1: Use exponents and scientific notation to write large and small numbers and vice versa and to solve problems.
- MA.8.A.6.2: Make reasonable approximations of square roots and mathematical expressions that include square roots, and use them to estimate solutions to problems and to compare mathematical expressions involving real numbers and radical expressions.
- MA.8.A.6.3: Simplify real number expressions using the laws of exponents.
- MA.8.A.6.4: Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, and irrational numbers) using multi-step and real world problems.

- MA.8.G.2.2: Classify and determine the measure of angles, including angles created when parallel lines are cut by transversals.
- MA.8.G.2.3: Demonstrate that the sum of the angles in a triangle is 180-degrees and apply this fact to find unknown measure of angles and the sum of angles in polygons.
- MA.8.G.2.4: Validate and apply Pythagorean Theorem to find distances in real world situations or between points in the coordinate plane.
- MA.8.G.5.1: Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)) and dimensions including temperature, area, volume, and derived units to solve problems.
- MA.8.S.3.1: Select, organize and construct appropriate data displays, including box and whisker plots, scatter plots, and lines of best fit to convey information and make conjectures about possible relationships.
- MA.8.S.3.2: Determine and describe how changes in data values impact measures of central tendency.

Course: 1205040 M/J Mathematics 2

## GENERAL INFORMATION

Course Number: 1205040  
Course Title: M/J Mathematics 2  
Abbreviated Title: M/J MATH 2  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 6 to 8 Education Courses » Subject: Mathematics » SubSubject: General Mathematics »  
Course Length: Year  
Course Type: Core  
Course Level: 2  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.68.RST.2 Craft and Structure**  
LACC.68.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

**LACC.68.RST.3 Integration of Knowledge and Ideas**  
LACC.68.RST.3.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.7.A.1.1: Distinguish between situations that are proportional or not proportional, and use proportions to solve problems.

MA.7.A.1.2: Solve percent problems, including problems involving discounts, simple interest, taxes, tips, and percents of increase or decrease.

MA.7.A.1.3: Solve problems involving similar figures.

MA.7.A.1.4: Graph proportional relationships and identify the unit rate as the slope of the related linear function.

MA.7.A.1.5: Distinguish direct variation from other relationships, including inverse variation.

MA.7.A.1.6: Apply proportionality to measurement in multiple contexts, including scale drawings and constant speed.

MA.7.A.3.1: Use and justify the rules for adding, subtracting, multiplying, dividing, and finding the absolute value of integers.

- MA.7.A.3.2: Add, subtract, multiply, and divide integers, fractions, and terminating decimals, and perform exponential operations with rational bases and whole number exponents including solving problems in everyday contexts.
- MA.7.A.3.3: Formulate and use different strategies to solve one-step and two-step linear equations, including equations with rational coefficients.
- MA.7.A.3.4: Use the properties of equality to represent an equation in a different way and to show that two equations are equivalent in a given context.
- MA.7.A.5.1: Express rational numbers as terminating or repeating decimals.
- MA.7.A.5.2: Solve non-routine problems by working backwards.
- MA.7.G.2.1: Justify and apply formulas for surface area and volume of pyramids, prisms, cylinders, and cones.
- MA.7.G.2.2: Use formulas to find surface areas and volume of three-dimensional composite shapes.
- MA.7.G.4.1: Determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures, and apply these relationships to solve problems.
- MA.7.G.4.2: Predict the results of transformations, and draw transformed figures with and without the coordinate plane.
- MA.7.G.4.3: Identify and plot ordered pairs in all four quadrants of the coordinate plane.
- MA.7.G.4.4: Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)), dimensions, and derived units to solve problems.
- MA.7.P.7.1: Determine the outcome of an experiment and predict which events are likely or unlikely, and if the experiment is fair or unfair.
- MA.7.P.7.2: Determine, compare, and make predictions based on experimental or theoretical probability of independent or dependent events.
- MA.7.S.6.1: Evaluate the reasonableness of a sample to determine the appropriateness of generalizations made about the population.
- MA.7.S.6.2: Construct and analyze histograms, stem-and-leaf plots, and circle graphs.

Course: 1205020 M/J Mathematics 1, Advanced

## GENERAL INFORMATION

Course Number: 1205020  
Course Title: M/J Mathematics 1, Advanced  
Abbreviated Title: M/J MATH 1 ADV  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 6 to 8 Education Courses » Subject: Mathematics » SubSubject: General Mathematics »  
Course Length: Year  
Course Type: Core  
Course Level: 3  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.68.RST.2 Craft and Structure**  
LACC.68.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

**LACC.68.RST.3 Integration of Knowledge and Ideas**  
LACC.68.RST.3.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.6.A.1.1: Explain and justify procedures for multiplying and dividing fractions and decimals.

MA.6.A.1.2: Multiply and divide fractions and decimals efficiently.

MA.6.A.1.3: Solve real-world problems involving multiplication and division of fractions and decimals.

MA.6.A.2.1: Use reasoning about multiplication and division to solve ratio and rate problems.

MA.6.A.2.2: Interpret and compare ratios and rates.

MA.6.A.3.1: Write and evaluate mathematical expressions that correspond to given situations.

MA.6.A.3.2: Write, solve, and graph one- and two- step linear equations and inequalities.

MA.6.A.3.3: Work backward with two-step function rules to undo expressions.

- MA.6.A.3.4: Solve problems given a formula.
- MA.6.A.3.5: Apply the Commutative, Associative, and Distributive Properties to show that two expressions are equivalent.
- MA.6.A.3.6: Construct and analyze tables, graphs, and equations to describe linear functions and other simple relations using both common language and algebraic notation.
- MA.6.A.5.1: Use equivalent forms of fractions, decimals, and percents to solve problems.
- MA.6.A.5.2: Compare and order fractions, decimals, and percents, including finding their approximate location on a number line.
- MA.6.A.5.3: Estimate the results of computations with fractions, decimals, and percents, and judge the reasonableness of the results.
- MA.6.G.4.1: Understand the concept of  $\pi$ , know common estimates of  $\pi$  (3.14;  $22/7$ ) and use these values to estimate and calculate the circumference and the area of circles.
- MA.6.G.4.2: Find the perimeters and areas of composite two-dimensional figures, including non-rectangular figures (such as semicircles) using various strategies.
- MA.6.G.4.3: Determine a missing dimension of a plane figure or prism given its area or volume and some of the dimensions, or determine the area or volume given the dimensions.
- MA.6.S.6.1: Determine the measures of central tendency (mean, median, mode) and variability (range) for a given set of data.
- MA.6.S.6.2: Select and analyze the measures of central tendency or variability to represent, describe, analyze, and/or summarize a data set for the purposes of answering questions appropriately.
- MA.7.A.1.2: Solve percent problems, including problems involving discounts, simple interest, taxes, tips, and percents of increase or decrease.
- MA.7.A.3.1: Use and justify the rules for adding, subtracting, multiplying, dividing, and finding the absolute value of integers.
- MA.7.A.3.2: Add, subtract, multiply, and divide integers, fractions, and terminating decimals, and perform exponential operations with rational bases and whole number exponents including solving problems in everyday contexts.
- MA.7.A.3.3: Formulate and use different strategies to solve one-step and two-step linear equations, including equations with rational coefficients.



- MA.7.A.3.4: Use the properties of equality to represent an equation in a different way and to show that two equations are equivalent in a given context.
- MA.7.A.5.1: Express rational numbers as terminating or repeating decimals.  
MA.7.A.5.2: Solve non-routine problems by working backwards.
- MA.7.G.2.1: Justify and apply formulas for surface area and volume of pyramids, prisms, cylinders, and cones.
- MA.7.G.2.2: Use formulas to find surface areas and volume of three-dimensional composite shapes.
- MA.7.G.4.3: Identify and plot ordered pairs in all four quadrants of the coordinate plane.

Course: 1205010 M/J Mathematics 1

## GENERAL INFORMATION

Course Number: 1205010  
Course Title: M/J Mathematics 1  
Abbreviated Title: M/J MATH 1  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 6 to 8 Education Courses » Subject: Mathematics » SubSubject: General Mathematics »  
Course Length: Year  
Course Type: Core  
Course Level: 2  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.68.RST.2 Craft and Structure**  
LACC.68.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

**LACC.68.RST.3 Integration of Knowledge and Ideas**  
LACC.68.RST.3.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.6.A.1.1: Explain and justify procedures for multiplying and dividing fractions and decimals.

MA.6.A.1.2: Multiply and divide fractions and decimals efficiently.

MA.6.A.1.3: Solve real-world problems involving multiplication and division of fractions and decimals.

MA.6.A.2.1: Use reasoning about multiplication and division to solve ratio and rate problems.

MA.6.A.2.2: Interpret and compare ratios and rates.

MA.6.A.3.1: Write and evaluate mathematical expressions that correspond to given situations.

MA.6.A.3.2: Write, solve, and graph one- and two- step linear equations and inequalities.

MA.6.A.3.3: Work backward with two-step function rules to undo expressions.

- MA.6.A.3.4: Solve problems given a formula.
- MA.6.A.3.5: Apply the Commutative, Associative, and Distributive Properties to show that two expressions are equivalent.
- MA.6.A.3.6: Construct and analyze tables, graphs, and equations to describe linear functions and other simple relations using both common language and algebraic notation.
- MA.6.A.5.1: Use equivalent forms of fractions, decimals, and percents to solve problems.
- MA.6.A.5.2: Compare and order fractions, decimals, and percents, including finding their approximate location on a number line.
- MA.6.A.5.3: Estimate the results of computations with fractions, decimals, and percents, and judge the reasonableness of the results
- MA.6.G.4.1: Understand the concept of Pi, know common estimates of  $\pi$  (3.14;  $\frac{22}{7}$ ) and use these values to estimate and calculate the circumference and the area of circles.
- MA.6.G.4.2: Find the perimeters and areas of composite two-dimensional figures, including non-rectangular figures (such as semicircles) using various strategies
- MA.6.G.4.3: Determine a missing dimension of a plane figure or prism given its area or volume and some of the dimensions, or determine the area or volume given the dimensions.
- MA.6.S.6.1: Determine the measures of central tendency (mean, median, mode) and variability (range) for a given set of data.
- MA.6.S.6.2: Select and analyze the measures of central tendency or variability to represent, describe, analyze, and/or summarize a data set for the purposes of answering questions appropriately.

Course: 1298310 Advanced Topics in Mathematics (formerly 129830A)

## GENERAL INFORMATION

Course Number: 1298310  
Course Title: Advanced Topics in Mathematics (formerly 129830A)  
Abbreviated Title: ADV TOPICS IN MATH  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Liberal Arts Mathematics »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Level: 2  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

- LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
- LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.
- LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
- LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

- MA.912.A.2.6: Identify and graph common functions (including but not limited to linear, rational, quadratic, cubic, radical, absolute value).
- MA.912.A.2.8: Determine the composition of functions.
- MA.912.A.2.9: Recognize, interpret, and graph functions defined piece-wise with and without technology.
- MA.912.A.2.13: Solve real-world problems involving relations and functions.

- MA.912.A.4.6: Use theorems of polynomial behavior (including but not limited to the Fundamental Theorem of Algebra, Remainder Theorem, the Rational Root Theorem, Descartes' Rule of Signs, and the Conjugate Root Theorem) to find the zeros of a polynomial function.
- MA.912.A.4.7: Write a polynomial equation for a given set of real and/or complex roots.
- MA.912.A.4.8: Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression with and without technology.
- MA.912.A.4.11: Solve a polynomial inequality by examining the graph with and without the use of technology.
- MA.912.A.5.1: Simplify algebraic ratios.
- MA.912.A.5.2: Add, subtract, multiply, and divide rational expressions.
- MA.912.A.5.3: Simplify complex fractions.
- MA.912.A.5.5: Solve rational equations.
- MA.912.A.5.6: Identify removable and non-removable discontinuities, and vertical, horizontal, and oblique asymptotes of a graph of a rational function, find the zeros, and graph the function.
- MA.912.A.5.7: Solve real-world problems involving rational equations (mixture, distance, work, interest, and ratio).
- MA.912.A.7.5: Solve quadratic equations over the complex number system.
- MA.912.A.7.7: Solve non-linear systems of equations with and without using technology.
- MA.912.A.8.2: Define and use the properties of logarithms to simplify logarithmic expressions and to find their approximate values.
- MA.912.A.8.3: Graph exponential and logarithmic functions.
- MA.912.A.8.5: Solve logarithmic and exponential equations.
- MA.912.A.9.1: Write the equations of conic sections in standard form and general form, in order to identify the conic section and to find its geometric properties (foci, asymptotes, eccentricity, etc.).
- MA.912.A.9.2: Graph conic sections with and without using graphing technology.
- MA.912.A.9.3: Solve real-world problems involving conic sections.

- MA.912.D.11.1: Define arithmetic and geometric sequences and series.
- MA.912.D.11.2: Use sigma notation to describe series.
- MA.912.D.11.3: Find specified terms of arithmetic and geometric sequences.
- MA.912.D.11.4: Find partial sums of arithmetic and geometric series, and find sums of infinite convergent geometric series. Use Sigma notation where applicable.
- MA.912.D.8.1: Use matrices to organize and store data. Perform matrix operations (addition, subtraction, scalar multiplication, multiplication)
- MA.912.D.8.2: Use matrix operations to solve problems.
- MA.912.D.8.4: Find the inverse of a matrix, and use the inverse to solve problems with and without the use of technology.
- MA.912.D.8.5: Use determinants of  $2 \times 2$  and  $3 \times 3$  matrices as well as higher order matrices with and without the use of technology.
- MA.912.F.1.1: Explain the difference between simple and compound interest.
- MA.912.F.1.2: Solve problems involving compound interest.
- MA.912.F.1.3: Demonstrate the relationship between simple interest and linear growth.
- MA.912.F.1.4: Demonstrate the relationship between compound interest and exponential growth.
- MA.912.F.2.1: Calculate the future value of a given amount of money with and without technology.
- MA.912.P.1.1: Use counting principles, including the addition and the multiplication principles, to determine size of finite sample spaces and probabilities of events in those spaces.
- MA.912.P.1.2: Use formulas for permutations and combinations to count outcomes and determine probabilities of events.
- MA.912.P.2.1: Determine probabilities of complementary events, and calculate odds for and against the occurrence of events.
- MA.912.P.2.2: Determine probabilities of independent events.
- MA.912.P.2.3: Understand and use the concept of conditional probability, including: understanding how conditioning affects the probability of events and; finding conditional probabilities from a two-way frequency table.

- MA.912.S.3.3: Calculate and interpret measures of the center of a set of data, including mean, median, and weighted mean, and use these measures to make comparisons among sets of data.
- MA.912.S.3.4: Calculate and interpret measures of variance and standard deviation. Use these measures to make comparisons among sets of data.
- MA.912.S.3.5: Calculate and interpret the range and quartiles of a set of data.
- MA.912.S.3.6: Use empirical rules (e.g., 68-95-99.7 rule) to estimate spread of distributions and to make comparisons among sets of data.
- MA.912.T.2.1: Define and use the trigonometric ratios (sine, cosine, tangent, cotangent, secant, cosecant) in terms of angles of right triangles.
- MA.912.T.2.2: Solve real-world problems involving right triangles using technology when appropriate.

Course: 1220910 Discrete Mathematics Honors

## GENERAL INFORMATION

Course Number: 1220910  
Course Title: Discrete Mathematics Honors  
Abbreviated Title: DISCRETE MATH HON  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Discrete Mathematics »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Type: Core  
Course Level: 3  
Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

- LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
- LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.
- LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
- LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.



## NEXT GENERATION SUNSHINE STATE STANDARDS

- MA.912.A.10.1: Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guessing- and-checking, solving a simpler problem, writing an equation, working backwards, and creating a table.
- MA.912.A.10.2: Decide whether a solution is reasonable in the context of the original situation.
- MA.912.A.7.9: Solve optimization problems.
- MA.912.D.1.1: Use recursive and iterative thinking to solve problems, including identification of patterns, population growth and decline, and compound interest.
- MA.912.D.1.2: Use finite differences to solve problems and to find explicit formulas for recurrence relations.
- MA.912.D.1.3: Use mathematical induction to prove various concepts in number theory (such as sums of infinite integer series, divisibility statements, and parity statements), recurrence relations, and other applications.
- MA.912.D.11.1: Define arithmetic and geometric sequences and series.
- MA.912.D.11.2: Use sigma notation to describe series.
- MA.912.D.11.3: Find specified terms of arithmetic and geometric sequences.
- MA.912.D.11.4: Find partial sums of arithmetic and geometric series, and find sums of infinite convergent geometric series. Use Sigma notation where applicable.
- MA.912.D.11.5: Explore and use other sequences found in nature such as the Fibonacci sequence and the golden ratio.
- MA.912.D.2.1: Use Euler and Hamilton cycles and paths in graphs to solve routing problems.
- MA.912.D.2.2: Use critical path analysis to solve scheduling problems.
- MA.912.D.2.3: Use graph coloring techniques to solve problems.
- MA.912.D.2.4: Use spanning trees, rooted trees, binary trees, and decision trees to solve problems.
- MA.912.D.4.1: Solve maximal profit/minimal cost problems.
- MA.912.D.6.1: Use truth tables to determine truth values of propositional statements.
- MA.912.D.6.2: Find the converse, inverse, and contrapositive of a statement
- MA.912.D.6.3: Determine whether two propositions are logically equivalent.

- MA.912.D.6.4: Use methods of direct and indirect proof and determine whether a short proof is logically valid.
- MA.912.D.6.5: Identify and give examples of :
- undefined terms;
  - axioms;
  - theorems;
  - inductive and deductive proofs; and,
  - inductive and deductive reasoning.
- MA.912.D.6.6: Construct logical arguments using laws of detachment (modus ponens), syllogism, tautology, and contradiction; judge the validity of arguments, and give counterexamples to disprove statements.
- MA.912.D.6.7: Use applications of the universal and existential quantifiers to propositional statements.
- MA.912.D.7.1: Perform set operations such as union and intersection, complement, and cross product.
- MA.912.D.7.2: Use Venn diagrams to explore relationships and patterns and to make arguments about relationships between sets.
- MA.912.D.8.1: Use matrices to organize and store data. Perform matrix operations (addition, subtraction, scalar multiplication, multiplication)
- MA.912.D.8.2: Use matrix operations to solve problems.
- MA.912.D.8.4: Find the inverse of a matrix, and use the inverse to solve problems with and without the use of technology.
- MA.912.D.8.5: Use determinants of  $2 \times 2$  and  $3 \times 3$  matrices as well as higher order matrices with and without the use of technology.
- MA.912.D.8.6: Use matrices to solve Markov chain problems that link present events to future events using probabilities.
- MA.912.P.1.1: Use counting principles, including the addition and the multiplication principles, to determine size of finite sample spaces and probabilities of events in those spaces.
- MA.912.P.1.2: Use formulas for permutations and combinations to count outcomes and determine probabilities of events.
- MA.912.P.2.2: Determine probabilities of independent events.

Course: 1211300 Trigonometry Honors

## GENERAL INFORMATION

Course Number: 1211300  
Course Title: Trigonometry Honors  
Abbreviated Title: TRIG HON  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Trigonometry »  
Number of Credits: Half credit (0.5)  
Course Length: Semester  
Course Type: Core  
Course Level: 3  
Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

- LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
- LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.
- LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
- LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

- MA.912.D.9.1: Demonstrate an understanding of the geometric interpretation of vectors and vector operations including addition, scalar multiplication, dot product, and cross product in the plane and in three-dimensional space.
- MA.912.D.9.2: Demonstrate an understanding of the algebraic interpretation of vectors and vector operations including addition, scalar multiplication, dot product, and cross product in the plane and in three-dimensional space.
- MA.912.D.9.3: Use vectors to model and solve application problems.
- MA.912.T.1.1: Convert between degree and radian measures.
- MA.912.T.1.2: Define and determine sine and cosine using the unit circle.
- MA.912.T.1.3: State and use exact values of trigonometric functions for special angles: multiples of  $\pi/6$  and  $\pi/4$  (degree and radian measures).
- MA.912.T.1.4: Find approximate values of trigonometric and inverse trigonometric functions using appropriate technology.
- MA.912.T.1.5: Make connections between right triangle ratios, trigonometric functions, and circular functions.
- MA.912.T.1.6: Define and graph trigonometric functions using domain, range, intercepts, period, amplitude, phase shift, vertical shift, and asymptotes with and without the use of graphing technology.
- MA.912.T.1.7: Define and graph inverse trigonometric relations and functions.
- MA.912.T.1.8: Solve real-world problems involving applications of trigonometric functions using graphing technology when appropriate.
- MA.912.T.2.1: Define and use the trigonometric ratios (sine, cosine, tangent, cotangent, secant, cosecant) in terms of angles of right triangles.
- MA.912.T.2.2: Solve real-world problems involving right triangles using technology when appropriate.
- MA.912.T.2.3: Apply the laws of sines and cosines to solve real-world problems using technology.
- MA.912.T.2.4: Use the area of triangles given two sides and an angle or three sides to solve real-world problems.
- MA.912.T.3.1: Verify the basic Pythagorean identities, such as  $\sin^2 x + \cos^2 x = 1$ , and show they are equivalent to the Pythagorean Theorem.
- MA.912.T.3.2: Use basic trigonometric identities to verify other identities and simplify expressions.

- MA.912.T.3.3: Use the sum and difference, half-angle and double-angle formulas for sine, cosine, and tangent, when formulas are provided.
- MA.912.T.3.4: Solve trigonometric equations and real-world problems involving applications of trigonometric equations using technology when appropriate.
- MA.912.T.4.1: Define polar coordinates and relate polar coordinates to Cartesian coordinates with and without the use of technology.
- MA.912.T.4.2: Represent equations given in rectangular coordinates in terms of polar coordinates.
- MA.912.T.4.3: Graph equations in the polar coordinate plane with and without the use of graphing technology.
- MA.912.T.4.4: Define the trigonometric form of complex numbers, convert complex numbers to trigonometric form, and multiply complex numbers in trigonometric form.
- MA.912.T.4.5: Apply DeMoivre's Theorem to perform operations with complex numbers.

Course: 1210300 Probability & Statistics with Applications Honors

## GENERAL INFORMATION

Course Number: 1210300  
Course Title: Probability & Statistics with Applications Honors  
Abbreviated Title: PROB, STAT W/APPLS HON  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Probability and Statistics »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Type: Core  
Course Level: 3  
Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

- LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
- LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.
- LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
- LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

- MA.912.P.1.1: Use counting principles, including the addition and the multiplication principles, to determine size of finite sample spaces and probabilities of events in those spaces.
- MA.912.P.1.2: Use formulas for permutations and combinations to count outcomes and determine probabilities of events.
- MA.912.P.2.1: Determine probabilities of complementary events, and calculate odds for and against the occurrence of events.
- MA.912.P.2.2: Determine probabilities of independent events.
- MA.912.P.2.3: Understand and use the concept of conditional probability, including: understanding how conditioning affects the probability of events and finding conditional probabilities from a two-way frequency table.
- MA.912.P.3.1: Determine probabilities of events from distributions, including:
- discrete uniform (all outcomes in a finite set equally likely)
  - binomial
  - normal
  - exponential
- MA.912.P.3.2: Determine the mean and variance of distributions, including:
- discrete uniform (all outcomes in a finite set equally likely)
  - binomial
  - normal
  - exponential
- MA.912.P.3.3: Apply the properties of the normal distribution.
- MA.912.P.3.4: Apply the Central Limit Theorem to determine the probability that a sample mean will be in a certain interval.
- MA.912.S.1.1: Formulate an appropriate research question to be answered by collecting data or performing an experiment.
- MA.912.S.1.2: Determine appropriate and consistent standards of measurement for the data to be collected in a survey or experiment.
- MA.912.S.2.1: Compare the difference between surveys, experiments, and observational studies and what types of questions can and cannot be answered by a particular design.
- MA.912.S.2.2: Apply the definition of random sample and basic types of sampling, including representative samples, stratified samples, censuses.
- MA.912.S.2.3: Identify sources of bias, including sampling and nonsampling errors.

- MA.912.S.3.1: Read and interpret data presented in various formats. Determine whether data is presented in appropriate format, and identify possible corrections. Formats to include:
- bar graphs
  - line graphs
  - stem and leaf plots
  - circle graphs
  - histograms
  - box and whiskers plots
  - scatter plots
  - cumulative frequency (ogive) graphs
- MA.912.S.3.2: Collect, organize, and analyze data sets, determine the best format for the data and present visual summaries from the following:
- bar graphs
  - line graphs
  - stem and leaf plots
  - circle graphs
  - histograms
  - box and whisker plots
  - scatter plots
  - cumulative frequency (ogive) graphs
- MA.912.S.3.3: Calculate and interpret measures of the center of a set of data, including mean, median, and weighted mean, and use these measures to make comparisons among sets of data.
- MA.912.S.3.4: Calculate and interpret measures of variance and standard deviation. Use these measures to make comparisons among sets of data.
- MA.912.S.3.5: Calculate and interpret the range and quartiles of a set of data.
- MA.912.S.3.6: Use empirical rules such as the 68-95-99.7 rule to estimate spread of distributions and to make comparisons among sets of data.
- MA.912.S.3.7: Calculate the correlation coefficient of a set of paired data, and interpret the coefficient as a measure of the strength and direction of the relationship between the variables.
- MA.912.S.3.8: Determine whether a data distribution is symmetric or skewed based on an appropriate graphical presentation of the data.
- MA.912.S.3.9: Identify outliers in a set of data based on an appropriate graphical presentation of the data, and describe the effect of outliers on the mean, median, and range of the data.
- MA.912.S.4.1: Explain and interpret the concepts of confidence level and "margin of error."



- MA.912.S.4.2: Use a simulation to approximate sampling distributions for the mean, using repeated sampling simulations from a given population.
- MA.912.S.4.3: Apply the Central Limit Theorem to solve problems.
- MA.912.S.4.4: Approximate confidence intervals for means using simulations of the distribution of the sample mean.
- MA.912.S.4.5: Find the equation of the least squares regression line for a set of data.
- MA.912.S.5.1: Analyze the relationship between confidence level, margin of error, and sample size.
- MA.912.S.5.2: Apply the general principles of hypothesis testing.
- MA.912.S.5.3: Explain and identify the following: null hypothesis, alternative hypotheses, Type I error, and Type II error.
- MA.912.S.5.4: Explain the meaning of p-value and its role in hypothesis testing.
- MA.912.S.5.5: Perform hypothesis tests of means and proportions for large samples, using simulations to determine whether a sample mean (proportion) has a low likelihood of occurring.
- MA.912.S.5.6: Interpret the results of hypothesis tests of means and proportions, and make decisions based on p-values of test.
- MA.912.S.5.8: Use a regression line equation to make predictions.
- MA.912.S.5.9: Interpret the coefficient of determination,  $r^2$ , for a least-squares regression.

Course: 1208300 Liberal Arts Mathematics

## GENERAL INFORMATION

Course Number: 1208300  
Course Title: Liberal Arts Mathematics  
Abbreviated Title: LIB ARTS MATH  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Liberal Arts Mathematics »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Level: 2  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

- LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
- LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.
- LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
- LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

- MA.912.A.1.3: Simplify real number expressions using the laws of exponents.
- MA.912.A.1.4: Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers) using multi-step and real-world problems.
- MA.912.A.1.8: Use the zero product property of real numbers in a variety of contexts to identify solutions to equations.

- MA.912.A.2.1: Create a graph to represent a real-world situation.
- MA.912.A.2.2: Interpret a graph representing a real-world situation.
- MA.912.A.2.3: Describe the concept of a function, use function notation, determine whether a given relation is a function, and link equations to functions.
- MA.912.A.3.3: Solve literal equations for a specified variable.
- MA.912.A.3.4: Solve and graph simple and compound inequalities in one variable and be able to justify each step in a solution.
- MA.912.A.3.5: Symbolically represent and solve multi-step and real-world applications that involve linear equations and inequalities.
- MA.912.A.3.7: Rewrite equations of a line into slope-intercept form and standard form.
- MA.912.A.3.8: Graph a line given any of the following information: a table of values, the x- and y-intercepts, two points, the slope and a point, the equation of the line in slope-intercept form, standard form, or point-slope form.
- MA.912.A.3.9: Determine the slope, x-intercept, and y-intercept of a line given its graph, its equation, or two points on the line.
- MA.912.A.3.10: Write an equation of a line given any of the following information: two points on the line, its slope and one point on the line, or its graph. Also, find an equation of a new line parallel to a given line, or perpendicular to a given line, through a given point on the new line.
- MA.912.A.3.11: Write an equation of a line that models a data set, and use the equation or the graph to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change.
- MA.912.A.3.13: Use a graph to approximate the solution of a system of linear equations or inequalities in two variables with and without technology.
- MA.912.A.7.2: Solve quadratic equations over the real numbers by factoring and by using the quadratic formula.
- MA.912.G.1.1: Find the lengths and midpoints of line segments in two-dimensional coordinate systems.
- MA.912.G.1.4: Use coordinate geometry to find slopes, parallel lines, perpendicular lines, and equations of lines.

- MA.912.G.2.3: Use properties of congruent and similar polygons to solve mathematical or real-world problems.
- MA.912.G.2.5: Explain the derivation and apply formulas for perimeter and area of polygons (triangles, quadrilaterals, pentagons, etc.).
- MA.912.G.2.7: Determine how changes in dimensions affect the perimeter and area of common geometric figures.
- MA.912.G.3.1: Describe, classify, and compare relationships among quadrilaterals including the square, rectangle, rhombus, parallelogram, trapezoid, and kite.
- MA.912.G.4.4: Use properties of congruent and similar triangles to solve problems involving lengths and areas.
- MA.912.G.5.3: Use special right triangles ( $30^\circ - 60^\circ - 90^\circ$  and  $45^\circ - 45^\circ - 90^\circ$ ) to solve problems.
- MA.912.G.5.4: Solve real-world problems involving right triangles.
- MA.912.G.7.5: Explain and use formulas for lateral area, surface area, and volume of solids.
- MA.912.G.7.7: Determine how changes in dimensions affect the surface area and volume of common geometric solids.
- MA.912.G.8.2: Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess-and-check, solving a simpler problem, writing an equation, and working backwards.
- MA.912.G.8.3: Determine whether a solution is reasonable in the context of the original situation.
- MA.912.S.3.1: Read and interpret data presented in various formats. Determine whether data is presented in appropriate format, and identify possible corrections. Formats to include:
- bar graphs
  - line graphs
  - stem and leaf plots
  - circle graphs
  - histograms
  - box and whiskers plots
  - scatter plots
  - cumulative frequency (ogive) graphs
- MA.912.S.3.2: Collect, organize, and analyze data sets, determine the best format for the data and present visual summaries from the following:
- bar graphs

- line graphs
- stem and leaf plots
- circle graphs
- histograms
- box and whisker plots
- scatter plots
- cumulative frequency (ogive) graphs

MA.912.S.3.3: Calculate and interpret measures of the center of a set of data, including mean, median, and weighted mean, and use these measures to make comparisons among sets of data.

MA.912.S.3.5: Calculate and interpret the range and quartiles of a set of data.

Course: 1207330 Integrated Mathematics 3

## GENERAL INFORMATION

Course Number: 1207330  
Course Title: Integrated Mathematics 3  
Abbreviated Title: INTEG MATH 3  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Integrated Mathematics »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Level: 2  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.912.A.1.6: Identify the real and imaginary parts of complex numbers and perform basic operations.

MA.912.A.10.1: Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guessing- and-checking, solving a simpler problem, writing an equation, working backwards, and creating a table.

MA.912.A.10.2: Decide whether a solution is reasonable in the context of the original situation.

- MA.912.A.10.3: Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities, rational or radical expressions, or logarithmic or exponential functions).
- MA.912.A.2.5: Graph absolute value equations and inequalities in two variables.
- MA.912.A.2.6: Identify and graph common functions (including but not limited to linear, rational, quadratic, cubic, radical, absolute value).
- MA.912.A.2.7: Perform operations (addition, subtraction, division, and multiplication) of functions algebraically, numerically, and graphically.
- MA.912.A.2.8: Determine the composition of functions.
- MA.912.A.2.10: Describe and graph transformations of functions.
- MA.912.A.2.11: Solve problems involving functions and their inverses.
- MA.912.A.3.14: Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods.
- MA.912.A.3.15: Solve real-world problems involving systems of linear equations and inequalities in two and three variables.
- MA.912.A.4.4: Divide polynomials by monomials and polynomials with various techniques, including synthetic division.
- MA.912.A.4.5: Graph polynomial functions with and without technology and describe end behavior.
- MA.912.A.4.6: Use theorems of polynomial behavior (including but not limited to the Fundamental Theorem of Algebra, Remainder Theorem, the Rational Root Theorem, Descartes' Rule of Signs, and the Conjugate Root Theorem) to find the zeros of a polynomial function.
- MA.912.A.4.8: Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression with and without technology.
- MA.912.A.4.9: Use graphing technology to find approximate solutions for polynomial equations.
- MA.912.A.4.10: Use polynomial equations to solve real-world problems.
- MA.912.A.6.4: Convert between rational exponent and radical forms of expressions.
- MA.912.A.6.5: Solve equations that contain radical expressions.
- MA.912.A.7.3: Solve quadratic equations over the real numbers by completing the square.

- MA.912.A.7.4: Use the discriminant to determine the nature of the roots of a quadratic equation.
- MA.912.A.7.5: Solve quadratic equations over the complex number system.
- MA.912.A.8.1: Define exponential and logarithmic functions and determine their relationship.
- MA.912.A.8.2: Define and use the properties of logarithms to simplify logarithmic expressions and to find their approximate values.
- MA.912.A.8.3: Graph exponential and logarithmic functions.
- MA.912.A.8.5: Solve logarithmic and exponential equations.
- MA.912.A.8.6: Use the change of base formula.
- MA.912.A.8.7: Solve applications of exponential growth and decay.
- MA.912.D.11.1: Define arithmetic and geometric sequences and series.
- MA.912.D.11.3: Find specified terms of arithmetic and geometric sequences.
- MA.912.G.7.1: Describe and make regular, non-regular, and oblique polyhedra, and sketch the net for a given polyhedron and vice versa.
- MA.912.G.7.2: Describe the relationships between the faces, edges, and vertices of polyhedra.
- MA.912.G.7.4: Identify chords, tangents, radii, and great circles of spheres.
- MA.912.G.7.5: Explain and use formulas for lateral area, surface area, and volume of solids
- MA.912.G.7.6: Identify and use properties of congruent and similar solids.
- MA.912.G.7.7: Determine how changes in dimensions affect the surface area and volume of common geometric solids.
- MA.912.S.3.3: Calculate and interpret measures of the center of a set of data, including mean, median, and weighted mean, and use these measures to make comparisons among sets of data.
- MA.912.S.3.4: Calculate and interpret measures of variance and standard deviation. Use these measures to make comparisons among sets of data.
- MA.912.S.3.9: Identify outliers in a set of data based on an appropriate graphical presentation of the data, and describe the effect of outliers on the mean, median, and range of the data.
- MA.912.T.2.1: Define and use the trigonometric ratios (sine, cosine, tangent, cotangent, secant, cosecant) in terms of angles of right triangles.



Course: 1207320 Integrated Mathematics 2

## GENERAL INFORMATION

Course Number: 1207320  
Course Title: Integrated Mathematics 2  
Abbreviated Title: INTEG MATH 2  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Integrated Mathematics »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Level: 2  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.912.A.1.8: Use the zero product property of real numbers in a variety of contexts to identify solutions to equations.

MA.912.A.10.1: Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guessing- and-checking, solving a simpler problem, writing an equation, working backwards, and creating a table.

- MA.912.A.10.2: Decide whether a solution is reasonable in the context of the original situation.
- MA.912.A.10.3: Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities, rational or radical expressions, or logarithmic or exponential functions).
- MA.912.A.3.6: Solve and graph the solutions of absolute value equations and inequalities with one variable.
- MA.912.A.5.1: Simplify algebraic ratios.
- MA.912.A.5.2: Add, subtract, multiply, and divide rational expressions.
- MA.912.A.5.3: Simplify complex fractions.
- MA.912.A.5.4: Solve algebraic proportions.
- MA.912.A.5.5: Solve rational equations.
- MA.912.A.7.1: Graph quadratic equations with and without graphing technology.  
MA.912.A.7.2: Solve quadratic equations over the real numbers by factoring and by using the quadratic formula.
- MA.912.A.7.6: Identify the axis of symmetry, vertex, domain, range and intercept(s) for a given parabola.
- MA.912.A.7.8: Use quadratic equations to solve real-world problems.  
MA.912.A.7.10: Use graphing technology to find approximate solutions of quadratic equations.
- MA.912.G.2.4: Apply transformations (translations, reflections, rotations, dilations, and scale factors) to polygons. to determine congruence, similarity, and symmetry. Know that images formed by translations, reflections, and rotations are congruent to the original shape. Create and verify tessellations of the plane using polygons.
- MA.912.G.2.5: Explain the derivation and apply formulas for perimeter and area of polygons (triangles, quadrilaterals, pentagons, etc.).
- MA.912.G.2.7: Determine how changes in dimensions affect the perimeter and area of common geometric figures.
- MA.912.G.3.1: Describe, classify, and compare relationships among quadrilaterals including the square, rectangle, rhombus, parallelogram, trapezoid, and kite.
- MA.912.G.3.2: Compare and contrast special quadrilaterals on the basis of their properties.

- MA.912.G.3.3: Use coordinate geometry to prove properties of congruent, regular, and similar quadrilaterals.
- MA.912.G.3.4: Prove theorems involving quadrilaterals.
- MA.912.G.4.3: Construct triangles congruent to given triangles.
- MA.912.G.4.4: Use properties of congruent and similar triangles to solve problems involving lengths and areas.
- MA.912.G.4.5: Apply theorems involving segments divided proportionally.
- MA.912.G.4.6: Prove that triangles are congruent or similar and use the concept of corresponding parts of congruent triangles.
- MA.912.G.4.7: Apply the inequality theorems: triangle inequality, inequality in one triangle, and the Hinge Theorem.
- MA.912.G.5.2: State and apply the relationships that exist when the altitude is drawn to the hypotenuse of a right triangle.
- MA.912.G.5.3: Use special right triangles ( $30^\circ - 60^\circ - 90^\circ$  and  $45^\circ - 45^\circ - 90^\circ$ ) to solve problems.
- MA.912.G.5.4: Solve real-world problems involving right triangles.
- MA.912.G.6.2: Define and identify: circumference, radius, diameter, arc, arc length, chord, secant, tangent and concentric circles.
- MA.912.G.6.4: Determine and use measures of arcs and related angles (central, inscribed, and intersections of secants and tangents).
- MA.912.G.6.5: Solve real-world problems using measures of circumference, arc length, and areas of circles and sectors.
- MA.912.G.6.6: Given the center and the radius, find the equation of a circle in the coordinate plane or given the equation of a circle in center-radius form, state the center and the radius of the circle.
- MA.912.G.6.7: Given the equation of a circle in center-radius form or given the center and the radius of a circle, sketch the graph of the circle.
- MA.912.G.8.2: Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess-and-check, solving a simpler problem, writing an equation, and working backwards.
- MA.912.G.8.3: Determine whether a solution is reasonable in the context of the original situation.
- MA.912.G.8.5: Write geometric proofs, including proofs by contradiction and proofs involving coordinate geometry. Use and compare a variety

of ways to present deductive proofs, such as flow charts, paragraphs, two-column, and indirect proofs.

MA.912.G.8.6: Perform basic constructions using straightedge and compass, and/or drawing programs describing and justifying the procedures used. Distinguish between sketching, constructing, and drawing geometric figures.

MA.912.S.2.3: Identify sources of bias, including sampling and nonsampling errors.

MA.912.T.2.1: Define and use the trigonometric ratios (sine, cosine, tangent, cotangent, secant, cosecant) in terms of angles of right triangles.

Course: 1207310 Integrated Mathematics 1

## GENERAL INFORMATION

Course Number: 1207310  
Course Title: Integrated Mathematics 1  
Abbreviated Title: INTEG MATH 1  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Integrated Mathematics »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Level: 2  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

### **LACC.910.RST.2 Craft and Structure**

LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

### **LACC.1112.RST.2 Craft and Structure**

LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

### **LACC.910.RST.3 Integration of Knowledge and Ideas**

LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

### **LACC.1112.RST.3 Integration of Knowledge and Ideas**

LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.912.A.10.1: Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guessing- and-checking, solving a simpler problem, writing an equation, working backwards, and creating a table.

- MA.912.A.10.2: Decide whether a solution is reasonable in the context of the original situation.
- MA.912.A.10.3: Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities, rational or radical expressions, or logarithmic or exponential functions).
- MA.912.A.2.3: Describe the concept of a function, use function notation, determine whether a given relation is a function, and link equations to functions.
- MA.912.A.2.4: Determine the domain and range of a relation.
- MA.912.A.2.13: Solve real-world problems involving relations and functions.
- MA.912.A.3.1: Solve linear equations in one variable that include simplifying algebraic expressions.
- MA.912.A.3.2: Identify and apply the distributive, associative, and commutative properties of real numbers and the properties of equality.
- MA.912.A.3.3: Solve literal equations for a specified variable.
- MA.912.A.3.4: Solve and graph simple and compound inequalities in one variable and be able to justify each step in a solution.
- MA.912.A.3.7: Rewrite equations of a line into slope-intercept form and standard form.
- MA.912.A.3.8: Graph a line given any of the following information: a table of values, the x- and y-intercepts, two points, the slope and a point, the equation of the line in slope-intercept form, standard form, or point-slope form.
- MA.912.A.3.9: Determine the slope, x-intercept, and y-intercept of a line given its graph, its equation, or two points on the line.
- MA.912.A.3.10: Write an equation of a line given any of the following information: two points on the line, its slope and one point on the line, or its graph. Also, find an equation of a new line parallel to a given line, or perpendicular to a given line, through a given point on the new line.
- MA.912.A.3.11: Write an equation of a line that models a data set, and use the equation or the graph to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change.

- MA.912.A.3.12: Graph a linear equation or inequality in two variables with and without graphing technology. Write an equation or inequality represented by a given graph.
- MA.912.A.3.13: Use a graph to approximate the solution of a system of linear equations or inequalities in two variables with and without technology.
- MA.912.A.3.14: Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods.
- MA.912.A.3.15: Solve real-world problems involving systems of linear equations and inequalities in two and three variables.
- MA.912.A.4.1: Simplify monomials and monomial expressions using the laws of integral exponents.
- MA.912.A.4.2: Add, subtract, and multiply polynomials.
- MA.912.A.4.3: Factor polynomial expressions.
- MA.912.A.6.1: Simplify radical expressions
- MA.912.A.6.2: Add, subtract, multiply, and divide radical expressions (square roots and higher).
- MA.912.G.1.1: Find the lengths and midpoints of line segments in two-dimensional coordinate systems.
- MA.912.G.1.2: Construct congruent segments and angles, angle bisectors, and parallel and perpendicular lines using a straight edge and compass or a drawing program, explaining and justifying the process used.
- MA.912.G.1.3: Identify and use the relationships between special pairs of angles formed by parallel lines and transversals.
- MA.912.G.1.4: Use coordinate geometry to find slopes, parallel lines, perpendicular lines, and equations of lines.
- MA.912.G.2.1: Identify and describe convex, concave, regular, and irregular polygons.
- MA.912.G.2.2: Determine the measures of interior and exterior angles of polygons, justifying the method used.
- MA.912.G.4.1: Classify, construct, and describe triangles that are right, acute, obtuse, scalene, isosceles, equilateral, and equiangular.

- MA.912.G.4.2: Define, identify, and construct altitudes, medians, angle bisectors, perpendicular bisectors, orthocenter, centroid, incenter, and circumcenter.
- MA.912.G.5.1: Prove and apply the Pythagorean Theorem and its converse.  
MA.912.G.8.1: Analyze the structure of Euclidean geometry as an axiomatic system. Distinguish between undefined terms, definitions, postulates, and theorems.
- MA.912.G.8.2: Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess-and-check, solving a simpler problem, writing an equation, and working backwards.
- MA.912.G.8.3: Determine whether a solution is reasonable in the context of the original situation.



Course: 1206330 Analytic Geometry Honors

## GENERAL INFORMATION

Course Number: 1206330  
Course Title: Analytic Geometry Honors  
Abbreviated Title: ANLY GEO HON  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Geometry »  
Number of Credits: Half credit (.5)  
Course Length: Semester  
Course Level: 3  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.912.A.4.5: Graph polynomial functions with and without technology and describe end behavior.

MA.912.A.4.8: Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression with and without technology.

MA.912.A.4.9: Use graphing technology to find approximate solutions for polynomial equations.

- MA.912.A.5.6: Identify removable and non-removable discontinuities, and vertical, horizontal, and oblique asymptotes of a graph of a rational function, find the zeros, and graph the function.
- MA.912.A.8.7: Solve applications of exponential growth and decay.
- MA.912.A.9.1: Write the equations of conic sections in standard form and general form, in order to identify the conic section and to find its geometric properties (foci, asymptotes, eccentricity, etc.).
- MA.912.A.9.2: Graph conic sections with and without using graphing technology.
- MA.912.A.9.3: Solve real-world problems involving conic sections.
- MA.912.D.10.1: Sketch the graph of a curve in the plane represented parametrically, indicating the direction of motion.
- MA.912.D.10.2: Convert from a parametric representation of a plane curve to a rectangular equation and vice-versa.
- MA.912.D.10.3: Use parametric equations to model applications of motion in the plane.
- MA.912.D.6.4: Use methods of direct and indirect proof and determine whether a short proof is logically valid.

Course: 1206320 Geometry Honors

## GENERAL INFORMATION

Course Number: 1206320  
Course Title: Geometry Honors  
Abbreviated Title: GEO HON  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Geometry »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Level: 3  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.912.D.11.5: Explore and use other sequences found in nature such as the Fibonacci sequence and the golden ratio.

MA.912.D.6.1: Use truth tables to determine truth values of propositional statements.

MA.912.D.6.2: Find the converse, inverse, and contrapositive of a statement.

MA.912.D.6.3: Determine whether two propositions are logically equivalent.

- MA.912.D.6.4: Use methods of direct and indirect proof and determine whether a short proof is logically valid.
- MA.912.D.9.3: Use vectors to model and solve application problems.
- MA.912.G.1.1: Find the lengths and midpoints of line segments in two-dimensional coordinate systems.
- MA.912.G.1.2: Construct congruent segments and angles, angle bisectors, and parallel and perpendicular lines using a straight edge and compass or a drawing program, explaining and justifying the process used.
- MA.912.G.1.3: Identify and use the relationships between special pairs of angles formed by parallel lines and transversals.
- MA.912.G.2.1: Identify and describe convex, concave, regular, and irregular polygons.
- MA.912.G.2.2: Determine the measures of interior and exterior angles of polygons, justifying the method used.
- MA.912.G.2.3: Use properties of congruent and similar polygons to solve mathematical or real-world problems.
- MA.912.G.2.4: Apply transformations (translations, reflections, rotations, dilations, and scale factors) to polygons. to determine congruence, similarity, and symmetry. Know that images formed by translations, reflections, and rotations are congruent to the original shape. Create and verify tessellations of the plane using polygons.
- MA.912.G.2.5: Explain the derivation and apply formulas for perimeter and area of polygons (triangles, quadrilaterals, pentagons, etc.).
- MA.912.G.2.6: Use coordinate geometry to prove properties of congruent, regular and similar polygons, and to perform transformations in the plane.
- MA.912.G.2.7: Determine how changes in dimensions affect the perimeter and area of common geometric figures.
- MA.912.G.3.1: Describe, classify, and compare relationships among quadrilaterals including the square, rectangle, rhombus, parallelogram, trapezoid, and kite.
- MA.912.G.3.2: Compare and contrast special quadrilaterals on the basis of their properties.
- MA.912.G.3.3: Use coordinate geometry to prove properties of congruent, regular, and similar quadrilaterals.

- MA.912.G.3.4: Prove theorems involving quadrilaterals.
- MA.912.G.4.1: Classify, construct, and describe triangles that are right, acute, obtuse, scalene, isosceles, equilateral, and equiangular.
- MA.912.G.4.2: Define, identify, and construct altitudes, medians, angle bisectors, perpendicular bisectors, orthocenter, centroid, incenter, and circumcenter.
- MA.912.G.4.3: Construct triangles congruent to given triangles.
- MA.912.G.4.4: Use properties of congruent and similar triangles to solve problems involving lengths and areas.
- MA.912.G.4.5: Apply theorems involving segments divided proportionally.
- MA.912.G.4.6: Prove that triangles are congruent or similar and use the concept of corresponding parts of congruent triangles.
- MA.912.G.4.7: Apply the inequality theorems: triangle inequality, inequality in one triangle, and the Hinge Theorem.
- MA.912.G.4.8: Use coordinate geometry to prove properties of congruent, regular, and similar triangles.
- MA.912.G.5.1: Prove and apply the Pythagorean Theorem and its converse.
- MA.912.G.5.2: State and apply the relationships that exist when the altitude is drawn to the hypotenuse of a right triangle.
- MA.912.G.5.3: Use special right triangles ( $30^\circ - 60^\circ - 90^\circ$  and  $45^\circ - 45^\circ - 90^\circ$ ) to solve problems.
- MA.912.G.5.4: Solve real-world problems involving right triangles.
- MA.912.G.6.1: Determine the center of a given circle. Given three points not on a line, construct the circle that passes through them. Construct tangents to circles. Circumscribe and inscribe circles about and within triangles and regular polygons.
- MA.912.G.6.2: Define and identify: circumference, radius, diameter, arc, arc length, chord, secant, tangent and concentric circles.
- MA.912.G.6.3: Prove theorems related to circles, including related angles, chords, tangents, and secants.
- MA.912.G.6.4: Determine and use measures of arcs and related angles (central, inscribed, and intersections of secants and tangents).
- MA.912.G.6.5: Solve real-world problems using measures of circumference, arc length, and areas of circles and sectors.

- MA.912.G.6.6: Given the center and the radius, find the equation of a circle in the coordinate plane or given the equation of a circle in center-radius form, state the center and the radius of the circle.
- MA.912.G.6.7: Given the equation of a circle in center-radius form or given the center and the radius of a circle, sketch the graph of the circle.
- MA.912.G.7.1: Describe and make regular, non-regular, and oblique polyhedra, and sketch the net for a given polyhedron and vice versa.
- MA.912.G.7.2: Describe the relationships between the faces, edges, and vertices of polyhedra.
- MA.912.G.7.3: Identify, sketch, find areas and/or perimeters of cross sections of solid objects.
- MA.912.G.7.4: Identify chords, tangents, radii, and great circles of spheres.
- MA.912.G.7.5: Explain and use formulas for lateral area, surface area, and volume of solids.
- MA.912.G.7.6: Identify and use properties of congruent and similar solids.
- MA.912.G.7.7: Determine how changes in dimensions affect the surface area and volume of common geometric solids.
- MA.912.G.8.1: Analyze the structure of Euclidean geometry as an axiomatic system. Distinguish between undefined terms, definitions, postulates, and theorems.
- MA.912.G.8.2: Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess-and-check, solving a simpler problem, writing an equation, and working backwards.
- MA.912.G.8.3: Determine whether a solution is reasonable in the context of the original situation.
- MA.912.G.8.4: Make conjectures with justifications about geometric ideas. Distinguish between information that supports a conjecture and the proof of a conjecture.
- MA.912.G.8.5: Write geometric proofs, including proofs by contradiction and proofs involving coordinate geometry. Use and compare a variety of ways to present deductive proofs, such as flow charts, paragraphs, two-column, and indirect proofs.
- MA.912.G.8.6: Perform basic constructions using straightedge and compass, and/or drawing programs describing and justifying the procedures used. Distinguish between sketching, constructing, and drawing geometric figures.

MA.912.T.2.1:

Define and use the trigonometric ratios (sine, cosine, tangent, cotangent, secant, cosecant) in terms of angles of right triangles.

Course: 1206315 Geometry for Credit Recovery

## GENERAL INFORMATION

Course Number: 1206315  
Course Title: Geometry for Credit Recovery  
Abbreviated Title: GEO CR  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Geometry »  
Number of Credits: One credit (1)  
Course Length: Varies  
Course Level: 2  
Course Status: SBE Approval Pending  
Special Notes: *Credit Recovery courses are credit bearing courses with specific content requirements defined by Next Generation Sunshine State Standards and/or Common Core State Standards. Students enrolled in a Credit Recovery course must have previously attempted the corresponding course (and/or End-of-Course assessment) since the course requirements for the Credit Recovery course are exactly the same as the previously attempted corresponding course. For example, Geometry (1206310) and Geometry for Credit Recovery (1206315) have identical content requirements. It is important to note that Credit Recovery courses are not bound by Section 1003.436(1)(a), Florida Statutes, requiring a minimum of 135 hours of bona fide instruction (120 hours in a school/district implementing block scheduling) in a designed course of study that contains student performance standards, since the students have previously attempted successful completion of the corresponding course. Additionally, Credit Recovery courses should ONLY be used for credit recovery, grade forgiveness, or remediation for students needing to prepare for an End-of-Course assessment retake.*

## RELATED STANDARDS/BENCHMARKS

- LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
- LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.
- LACC.910.RST.3 Integration of Knowledge and Ideas**



LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**

LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

**NEXT GENERATION SUNSHINE STATE STANDARDS**

MA.912.D.6.2: Find the converse, inverse, and contrapositive of a statement.

MA.912.D.6.3: Determine whether two propositions are logically equivalent.

MA.912.D.6.4: Use methods of direct and indirect proof and determine whether a short proof is logically valid.

MA.912.G.1.1: Find the lengths and midpoints of line segments in two-dimensional coordinate systems.

MA.912.G.1.2: Construct congruent segments and angles, angle bisectors, and parallel and perpendicular lines using a straight edge and compass or a drawing program, explaining and justifying the process used.

MA.912.G.1.3: Identify and use the relationships between special pairs of angles formed by parallel lines and transversals.

MA.912.G.2.1: Identify and describe convex, concave, regular, and irregular polygons.

MA.912.G.2.2: Determine the measures of interior and exterior angles of polygons, justifying the method used.

MA.912.G.2.3: Use properties of congruent and similar polygons to solve mathematical or real-world problems.

MA.912.G.2.4: Apply transformations (translations, reflections, rotations, dilations, and scale factors) to polygons. to determine congruence, similarity, and symmetry. Know that images formed by translations, reflections, and rotations are congruent to the original shape. Create and verify tessellations of the plane using polygons.

MA.912.G.2.5: Explain the derivation and apply formulas for perimeter and area of polygons (triangles, quadrilaterals, pentagons, etc.).

MA.912.G.2.7: Determine how changes in dimensions affect the perimeter and area of common geometric figures.

- MA.912.G.3.1: Describe, classify, and compare relationships among quadrilaterals including the square, rectangle, rhombus, parallelogram, trapezoid, and kite.
- MA.912.G.3.2: Compare and contrast special quadrilaterals on the basis of their properties.
- MA.912.G.3.3: Use coordinate geometry to prove properties of congruent, regular, and similar quadrilaterals.
- MA.912.G.3.4: Prove theorems involving quadrilaterals.
- MA.912.G.4.1: Classify, construct, and describe triangles that are right, acute, obtuse, scalene, isosceles, equilateral, and equiangular.
- MA.912.G.4.2: Define, identify, and construct altitudes, medians, angle bisectors, perpendicular bisectors, orthocenter, centroid, incenter, and circumcenter.
- MA.912.G.4.3: Construct triangles congruent to given triangles.
- MA.912.G.4.4: Use properties of congruent and similar triangles to solve problems involving lengths and areas.
- MA.912.G.4.5: Apply theorems involving segments divided proportionally.
- MA.912.G.4.6: Prove that triangles are congruent or similar and use the concept of corresponding parts of congruent triangles.
- MA.912.G.4.7: Apply the inequality theorems: triangle inequality, inequality in one triangle, and the Hinge Theorem.
- MA.912.G.5.1: Prove and apply the Pythagorean Theorem and its converse.
- MA.912.G.5.2: State and apply the relationships that exist when the altitude is drawn to the hypotenuse of a right triangle.
- MA.912.G.5.3: Use special right triangles ( $30^\circ - 60^\circ - 90^\circ$  and  $45^\circ - 45^\circ - 90^\circ$ ) to solve problems.
- MA.912.G.5.4: Solve real-world problems involving right triangles.
- MA.912.G.6.2: Define and identify: circumference, radius, diameter, arc, arc length, chord, secant, tangent and concentric circles.
- MA.912.G.6.4: Determine and use measures of arcs and related angles (central, inscribed, and intersections of secants and tangents).
- MA.912.G.6.5: Solve real-world problems using measures of circumference, arc length, and areas of circles and sectors.

- MA.912.G.6.6: Given the center and the radius, find the equation of a circle in the coordinate plane or given the equation of a circle in center-radius form, state the center and the radius of the circle.
- MA.912.G.6.7: Given the equation of a circle in center-radius form or given the center and the radius of a circle, sketch the graph of the circle.
- MA.912.G.7.1: Describe and make regular, non-regular, and oblique polyhedra, and sketch the net for a given polyhedron and vice versa.
- MA.912.G.7.2: Describe the relationships between the faces, edges, and vertices of polyhedra.
- MA.912.G.7.4: Identify chords, tangents, radii, and great circles of spheres.
- MA.912.G.7.5: Explain and use formulas for lateral area, surface area, and volume of solids.
- MA.912.G.7.6: Identify and use properties of congruent and similar solids.
- MA.912.G.7.7: Determine how changes in dimensions affect the surface area and volume of common geometric solids.
- MA.912.G.8.1: Analyze the structure of Euclidean geometry as an axiomatic system. Distinguish between undefined terms, definitions, postulates, and theorems.
- MA.912.G.8.2: Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess-and-check, solving a simpler problem, writing an equation, and working backwards.
- MA.912.G.8.3: Determine whether a solution is reasonable in the context of the original situation.
- MA.912.G.8.4: Make conjectures with justifications about geometric ideas. Distinguish between information that supports a conjecture and the proof of a conjecture.
- MA.912.G.8.5: Write geometric proofs, including proofs by contradiction and proofs involving coordinate geometry. Use and compare a variety of ways to present deductive proofs, such as flow charts, paragraphs, two-column, and indirect proofs.
- MA.912.G.8.6: Perform basic constructions using straightedge and compass, and/or drawing programs describing and justifying the procedures used. Distinguish between sketching, constructing, and drawing geometric figures.
- MA.912.T.2.1: Define and use the trigonometric ratios (sine, cosine, tangent, cotangent, secant, cosecant) in terms of angles of right triangles.



Course: 1206310 Geometry

## GENERAL INFORMATION

Course Number: 1206310  
Course Title: Geometry  
Abbreviated Title: GEO  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Geometry »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Level: 2  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.912.D.6.2: Find the converse, inverse, and contrapositive of a statement.  
MA.912.D.6.3: Determine whether two propositions are logically equivalent.  
MA.912.D.6.4: Use methods of direct and indirect proof and determine whether a short proof is logically valid.  
MA.912.G.1.1: Find the lengths and midpoints of line segments in two-dimensional coordinate systems.

- MA.912.G.1.2: Construct congruent segments and angles, angle bisectors, and parallel and perpendicular lines using a straight edge and compass or a drawing program, explaining and justifying the process used.
- MA.912.G.1.3: Identify and use the relationships between special pairs of angles formed by parallel lines and transversals.
- MA.912.G.2.1: Identify and describe convex, concave, regular, and irregular polygons.
- MA.912.G.2.2: Determine the measures of interior and exterior angles of polygons, justifying the method used.
- MA.912.G.2.3: Use properties of congruent and similar polygons to solve mathematical or real-world problems.
- MA.912.G.2.4: Apply transformations (translations, reflections, rotations, dilations, and scale factors) to polygons. to determine congruence, similarity, and symmetry. Know that images formed by translations, reflections, and rotations are congruent to the original shape. Create and verify tessellations of the plane using polygons.
- MA.912.G.2.5: Explain the derivation and apply formulas for perimeter and area of polygons (triangles, quadrilaterals, pentagons, etc.).
- MA.912.G.2.7: Determine how changes in dimensions affect the perimeter and area of common geometric figures.
- MA.912.G.3.1: Describe, classify, and compare relationships among quadrilaterals including the square, rectangle, rhombus, parallelogram, trapezoid, and kite.
- MA.912.G.3.2: Compare and contrast special quadrilaterals on the basis of their properties.
- MA.912.G.3.3: Use coordinate geometry to prove properties of congruent, regular, and similar quadrilaterals.
- MA.912.G.3.4: Prove theorems involving quadrilaterals.
- MA.912.G.4.1: Classify, construct, and describe triangles that are right, acute, obtuse, scalene, isosceles, equilateral, and equiangular.
- MA.912.G.4.2: Define, identify, and construct altitudes, medians, angle bisectors, perpendicular bisectors, orthocenter, centroid, incenter, and circumcenter.
- MA.912.G.4.3: Construct triangles congruent to given triangles.

- MA.912.G.4.4: Use properties of congruent and similar triangles to solve problems involving lengths and areas.
- MA.912.G.4.5: Apply theorems involving segments divided proportionally.
- MA.912.G.4.6: Prove that triangles are congruent or similar and use the concept of corresponding parts of congruent triangles.
- MA.912.G.4.7: Apply the inequality theorems: triangle inequality, inequality in one triangle, and the Hinge Theorem.
- MA.912.G.5.1: Prove and apply the Pythagorean Theorem and its converse.
- MA.912.G.5.2: State and apply the relationships that exist when the altitude is drawn to the hypotenuse of a right triangle.
- MA.912.G.5.3: Use special right triangles ( $30^\circ - 60^\circ - 90^\circ$  and  $45^\circ - 45^\circ - 90^\circ$ ) to solve problems.
- MA.912.G.5.4: Solve real-world problems involving right triangles.
- MA.912.G.6.2: Define and identify: circumference, radius, diameter, arc, arc length, chord, secant, tangent and concentric circles.
- MA.912.G.6.4: Determine and use measures of arcs and related angles (central, inscribed, and intersections of secants and tangents).
- MA.912.G.6.5: Solve real-world problems using measures of circumference, arc length, and areas of circles and sectors.
- MA.912.G.6.6: Given the center and the radius, find the equation of a circle in the coordinate plane or given the equation of a circle in center-radius form, state the center and the radius of the circle.
- MA.912.G.6.7: Given the equation of a circle in center-radius form or given the center and the radius of a circle, sketch the graph of the circle.
- MA.912.G.7.1: Describe and make regular, non-regular, and oblique polyhedra, and sketch the net for a given polyhedron and vice versa.
- MA.912.G.7.2: Describe the relationships between the faces, edges, and vertices of polyhedra.
- MA.912.G.7.4: Identify chords, tangents, radii, and great circles of spheres.
- MA.912.G.7.5: Explain and use formulas for lateral area, surface area, and volume of solids.
- MA.912.G.7.6: Identify and use properties of congruent and similar solids.
- MA.912.G.7.7: Determine how changes in dimensions affect the surface area and volume of common geometric solids.

- MA.912.G.8.1: Analyze the structure of Euclidean geometry as an axiomatic system. Distinguish between undefined terms, definitions, postulates, and theorems.
- MA.912.G.8.2: Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess-and-check, solving a simpler problem, writing an equation, and working backwards.
- MA.912.G.8.3: Determine whether a solution is reasonable in the context of the original situation.
- MA.912.G.8.4: Make conjectures with justifications about geometric ideas. Distinguish between information that supports a conjecture and the proof of a conjecture.
- MA.912.G.8.5: Write geometric proofs, including proofs by contradiction and proofs involving coordinate geometry. Use and compare a variety of ways to present deductive proofs, such as flow charts, paragraphs, two-column, and indirect proofs.
- MA.912.G.8.6: Perform basic constructions using straightedge and compass, and/or drawing programs describing and justifying the procedures used. Distinguish between sketching, constructing, and drawing geometric figures.
- MA.912.T.2.1: Define and use the trigonometric ratios (sine, cosine, tangent, cotangent, secant, cosecant) in terms of angles of right triangles.



Course: 1206300 Informal Geometry

## GENERAL INFORMATION

Course Number: 1206300  
Course Title: Informal Geometry  
Abbreviated Title: INF GEO  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Geometry »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Level: 2  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.912.D.6.2: Find the converse, inverse, and contrapositive of a statement.

MA.912.G.1.1: Find the lengths and midpoints of line segments in two-dimensional coordinate systems.

MA.912.G.1.3: Identify and use the relationships between special pairs of angles formed by parallel lines and transversals.

- MA.912.G.2.1: Identify and describe convex, concave, regular, and irregular polygons.
- MA.912.G.2.2: Determine the measures of interior and exterior angles of polygons, justifying the method used.
- MA.912.G.2.3: Use properties of congruent and similar polygons to solve mathematical or real-world problems.
- MA.912.G.2.5: Explain the derivation and apply formulas for perimeter and area of polygons (triangles, quadrilaterals, pentagons, etc.).
- MA.912.G.3.1: Describe, classify, and compare relationships among quadrilaterals including the square, rectangle, rhombus, parallelogram, trapezoid, and kite.
- MA.912.G.3.2: Compare and contrast special quadrilaterals on the basis of their properties.
- MA.912.G.4.1: Classify, construct, and describe triangles that are right, acute, obtuse, scalene, isosceles, equilateral, and equiangular.
- MA.912.G.4.2: Define, identify, and construct altitudes, medians, angle bisectors, perpendicular bisectors, orthocenter, centroid, incenter, and circumcenter.
- MA.912.G.4.3: Construct triangles congruent to given triangles.
- MA.912.G.4.4: Use properties of congruent and similar triangles to solve problems involving lengths and areas.
- MA.912.G.4.5: Apply theorems involving segments divided proportionally.
- MA.912.G.4.6: Prove that triangles are congruent or similar and use the concept of corresponding parts of congruent triangles.
- MA.912.G.4.7: Apply the inequality theorems: triangle inequality, inequality in one triangle, and the Hinge Theorem.
- MA.912.G.5.1: Prove and apply the Pythagorean Theorem and its converse.
- MA.912.G.5.3: Use special right triangles ( $30^\circ - 60^\circ - 90^\circ$  and  $45^\circ - 45^\circ - 90^\circ$ ) to solve problems.
- MA.912.G.5.4: Solve real-world problems involving right triangles.
- MA.912.G.6.2: Define and identify: circumference, radius, diameter, arc, arc length, chord, secant, tangent and concentric circles.
- MA.912.G.6.4: Determine and use measures of arcs and related angles (central, inscribed, and intersections of secants and tangents).

- MA.912.G.6.5: Solve real-world problems using measures of circumference, arc length, and areas of circles and sectors.
- MA.912.G.7.1: Describe and make regular, non-regular, and oblique polyhedra, and sketch the net for a given polyhedron and vice versa.
- MA.912.G.7.2: Describe the relationships between the faces, edges, and vertices of polyhedra.
- MA.912.G.7.4: Identify chords, tangents, radii, and great circles of spheres.
- MA.912.G.7.5: Explain and use formulas for lateral area, surface area, and volume of solids.
- MA.912.G.7.7: Determine how changes in dimensions affect the surface area and volume of common geometric solids.
- MA.912.G.8.1: Analyze the structure of Euclidean geometry as an axiomatic system. Distinguish between undefined terms, definitions, postulates, and theorems.
- MA.912.G.8.2: Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess-and-check, solving a simpler problem, writing an equation, and working backwards.
- MA.912.G.8.3: Determine whether a solution is reasonable in the context of the original situation.
- MA.912.G.8.4: Make conjectures with justifications about geometric ideas. Distinguish between information that supports a conjecture and the proof of a conjecture.

Course: 1205540 Business Mathematics

## GENERAL INFORMATION

Course Number: 1205540  
Course Title: Business Mathematics  
Abbreviated Title: BUSINESS MATH  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group:  
Grades 9 to 12 and Adult Education Courses » Subject:  
Mathematics » SubSubject: General Mathematics »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Level: 1  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.6.A.1.3: Solve real-world problems involving multiplication and division of fractions and decimals.

MA.6.A.3.1: Write and evaluate mathematical expressions that correspond to given situations.

MA.6.A.3.4: Solve problems given a formula.

- MA.6.A.5.1: Use equivalent forms of fractions, decimals, and percents to solve problems.
- MA.6.A.5.3: Estimate the results of computations with fractions, decimals, and percents, and judge the reasonableness of the results.
- MA.6.S.6.1: Determine the measures of central tendency (mean, median, mode) and variability (range) for a given set of data.
- MA.7.A.1.2: Solve percent problems, including problems involving discounts, simple interest, taxes, tips, and percents of increase or decrease.
- MA.7.G.4.1: Determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures, and apply these relationships to solve problems.
- MA.7.G.4.4: Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)), dimensions, and derived units to solve problems.
- MA.8.A.6.1: Use exponents and scientific notation to write large and small numbers and vice versa and to solve problems.
- MA.8.A.6.4: Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, and irrational numbers) using multi-step and real world problems.
- MA.8.S.3.1: Select, organize and construct appropriate data displays, including box and whisker plots, scatter plots, and lines of best fit to convey information and make conjectures about possible relationships.
- MA.912.F.1.1: Explain the difference between simple and compound interest.
- MA.912.F.1.2: Solve problems involving compound interest.
- MA.912.F.2.1: Calculate the future value of a given amount of money with and without technology.
- MA.912.F.2.2: Calculate the present value of a certain amount of money for a given length of time in the future with and without technology.
- MA.912.F.3.1: Compare the advantages and disadvantages of using cash versus a credit card.
- MA.912.F.3.3: Calculate the finance charges and total amount due on a credit card bill.
- MA.912.F.3.6: Calculate total cost of purchasing consumer durables over time given different down payments, financing options, and fees.

- MA.912.F.4.2: Explain cash management strategies including debit accounts, checking accounts, and savings accounts.
- MA.912.F.4.5: Develop and apply a variety of strategies to use tax tables, and to determine, calculate, and complete yearly federal income tax
- MA.912.F.4.11: Purchase stock with a set amount of money, and follow the process through gains, losses, and selling.
- MA.912.F.4.13: Given current exchange rates be able to convert from one form of currency to another.
- MA.912.F.5.1: Demonstrate how price and quantity demanded relate, how price and quantity supplied relate, and how price changes or price controls affect distribution and allocation in the economy.

Course: 1205510 Explorations in Mathematics 2

## GENERAL INFORMATION

Course Number: 1205510  
Course Title: Explorations in Mathematics 2  
Abbreviated Title: EXPLORS IN MATH 2  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: General Mathematics »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Level: 1  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.6.G.4.1 Understand the concept of Pi, know common estimates of Pi (3.14; 22/7) and use these values to estimate and calculate the circumference and the area of circles.

MA.8.A.1.1 Create and interpret tables, graphs, and models to represent, analyze, and solve problems related to linear equations, including analysis of domain, range, and the difference between discrete and continuous data.

MA.8.A.1.3	Use tables, graphs, and models to represent, analyze, and solve real-world problems related to systems of linear equations.
MA.8.A.1.6	Compare the graphs of linear and non-linear functions for real-world situations.
MA.8.G.2.1	Use similar triangles to solve problems that include height and distances.
MA.8.G.2.4	Validate and apply Pythagorean Theorem to find distances in real world situations or between points in the coordinate plane.
MA.8.S.3.2	Determine and describe how changes in data values impact measures of central tendency.
MA.8.G.5.1	Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)) and dimensions including temperature, area, volume, and derived units to solve problems.
MA.8.A.6.1	Use exponents and scientific notation to write large and small numbers and vice versa and to solve problems.
MA.912.A.1.1	Know equivalent forms of real numbers (including integer exponents and radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers).
MA.912.A.3.1	Solve linear equations in one variable that include simplifying algebraic expressions.
MA.912.A.3.2	Identify and apply the distributive, associative, and commutative properties of real numbers and the properties of equality.
MA.912.A.10.1	Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guessing- and-checking, solving a simpler problem, writing an equation, working backwards, and creating a table.
MA.912.A.10.2	Decide whether a solution is reasonable in the context of the original situation.
MA.912.F.3.1	Compare the advantages and disadvantages of using cash versus a credit card.
MA.912.F.3.6	Calculate total cost of purchasing consumer durables over time given different down payments, financing options, and fees.
MA.912.F.4.1	Develop personal budgets that fit within various income brackets.
MA.912.F.4.2	Explain cash management strategies including debit accounts, checking accounts, and savings accounts.



Course: 1205500 Explorations in Mathematics 1

## GENERAL INFORMATION

Course Number: 1205500  
Course Title: Explorations in Mathematics 1  
Abbreviated Title: EXPLORS IN MATH 1  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group:  
Grades 9 to 12 and Adult Education Courses » Subject:  
Mathematics » SubSubject: General Mathematics »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Level: 1  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

- LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
- LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.
- LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
- LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

- MA.4.G.5.2: Identify and describe the results of translations, reflections, and rotations of 45, 90, 180, 270, and 360 degrees, including figures with line and rotational symmetry.

- MA.6.A.1.1: Explain and justify procedures for multiplying and dividing fractions and decimals.
- MA.6.A.1.2: Multiply and divide fractions and decimals efficiently.
- MA.6.A.1.3: Solve real-world problems involving multiplication and division of fractions and decimals.
- MA.6.A.2.1: Use reasoning about multiplication and division to solve ratio and rate problems.
- MA.6.A.2.2: Interpret and compare ratios and rates.
- MA.6.A.3.3: Work backward with two-step function rules to undo expressions.
- MA.6.A.3.4: Solve problems given a formula.
- MA.6.A.3.6: Construct and analyze tables, graphs, and equations to describe linear functions and other simple relations using both common language and algebraic notation.
- MA.6.S.6.1: Determine the measures of central tendency (mean, median, mode) and variability (range) for a given set of data.
- MA.7.A.1.2: Solve percent problems, including problems involving discounts, simple interest, taxes, tips, and percents of increase or decrease.
- MA.7.A.3.2: Add, subtract, multiply, and divide integers, fractions, and terminating decimals, and perform exponential operations with rational bases and whole number exponents including solving problems in everyday contexts.
- MA.7.A.5.1: Express rational numbers as terminating or repeating decimals.
- MA.7.G.4.3: Identify and plot ordered pairs in all four quadrants of the coordinate plane.
- MA.912.G.2.1: Identify and describe convex, concave, regular, and irregular polygons.
- MA.912.G.4.1: Classify, construct, and describe triangles that are right, acute, obtuse, scalene, isosceles, equilateral, and equiangular.
- MA.912.T.5.1: Use a variety of problem-solving strategies, such as drawing a diagram, guess-and-check, solving a simpler problem, examining simpler problems, and working backwards, using technology when appropriate.
- MA.912.T.5.2: Decide whether a solution is reasonable in the context of the original situation.

<b>Course Title:</b>	Applied Mathematics 3
<b>Course Number:</b>	1205420
<b>Course Abbreviated Title:</b>	APPLIED MATH 3
<b>Course Path:</b>	<b>Section:</b> <a href="#">Grades PreK to 12 Education Courses</a> » <b>Grade Group:</b> <a href="#">Grades 9 to 12 and Adult Education Courses</a> » <b>Subject:</b> <a href="#">Mathematics</a> » <b>SubSubject:</b> <a href="#">Applied Mathematics</a> »
<b>Number of Credits:</b>	One credit (1)
<b>Course length:</b>	Year
<b>Status:</b>	State Board Approved

<a href="#">LACC.1112.RST.2.4:</a>	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
<a href="#">LACC.1112.RST.3.7:</a>	Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
<a href="#">LACC.910.RST.2.4:</a>	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
<a href="#">LACC.910.RST.3.7:</a>	Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
<a href="#">MA.912.A.1.6:</a>	Identify the real and imaginary parts of complex numbers and perform basic operations.
<a href="#">MA.912.A.1.8:</a>	Use the zero product property of real numbers in a variety of contexts to identify solutions to equations.
<a href="#">MA.912.A.10.1:</a>	Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guessing- and-checking, solving a simpler problem, writing an equation, working backwards, and creating a table.
<a href="#">MA.912.A.10.2:</a>	Decide whether a solution is reasonable in the context of the original situation.
<a href="#">MA.912.A.10.3:</a>	Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or

	inequalities, rational or radical expressions, or logarithmic or exponential functions).
<a href="#"><u>MA.912.A.2.10:</u></a>	Describe and graph transformations of functions
<a href="#"><u>MA.912.A.2.11:</u></a>	Solve problems involving functions and their inverses.
<a href="#"><u>MA.912.A.2.12:</u></a>	Solve problems using direct, inverse, and joint variations.
<a href="#"><u>MA.912.A.2.5:</u></a>	Graph absolute value equations and inequalities in two variables.
<a href="#"><u>MA.912.A.2.6:</u></a>	Identify and graph common functions (including but not limited to linear, rational, quadratic, cubic, radical, absolute value).
<a href="#"><u>MA.912.A.2.7:</u></a>	Perform operations (addition, subtraction, division, and multiplication) of functions algebraically, numerically, and graphically.
<a href="#"><u>MA.912.A.2.8:</u></a>	Determine the composition of functions.
<a href="#"><u>MA.912.A.3.10:</u></a>	Write an equation of a line given any of the following information: two points on the line, its slope and one point on the line, or its graph. Also, find an equation of a new line parallel to a given line, or perpendicular to a given line, through a given point on the new line.
<a href="#"><u>MA.912.A.3.13:</u></a>	Use a graph to approximate the solution of a system of linear equations or inequalities in two variables with and without technology.
<a href="#"><u>MA.912.A.3.14:</u></a>	Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods.
<a href="#"><u>MA.912.A.3.15:</u></a>	Solve real-world problems involving systems of linear equations and inequalities in two and three variables.
<a href="#"><u>MA.912.A.3.3:</u></a>	Solve literal equations for a specified variable.
<a href="#"><u>MA.912.A.3.6:</u></a>	Solve and graph the solutions of absolute value equations and inequalities with one variable.
<a href="#"><u>MA.912.A.4.10:</u></a>	Use polynomial equations to solve real-world problems.
<a href="#"><u>MA.912.A.4.3:</u></a>	Factor polynomial expressions.
<a href="#"><u>MA.912.A.4.4:</u></a>	Divide polynomials by monomials and polynomials with various techniques, including synthetic division.
<a href="#"><u>MA.912.A.4.5:</u></a>	Graph polynomial functions with and without technology and describe end behavior.
<a href="#"><u>MA.912.A.4.6:</u></a>	Use theorems of polynomial behavior (including but not limited to the Fundamental Theorem of Algebra, Remainder Theorem, the Rational

	Root Theorem, Descartes' Rule of Signs, and the Conjugate Root Theorem) to find the zeros of a polynomial function.
<a href="#"><u>MA.912.A.4.7:</u></a>	Write a polynomial equation for a given set of real and/or complex roots.
<a href="#"><u>MA.912.A.4.8:</u></a>	Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression with and without technology.
<a href="#"><u>MA.912.A.4.9:</u></a>	Use graphing technology to find approximate solutions for polynomial equations.
<a href="#"><u>MA.912.A.5.2:</u></a>	Add, subtract, multiply, and divide rational expressions.
<a href="#"><u>MA.912.A.5.3:</u></a>	Simplify complex fractions.
<a href="#"><u>MA.912.A.5.4:</u></a>	Solve algebraic proportions.
<a href="#"><u>MA.912.A.5.5:</u></a>	Solve rational equations.
<a href="#"><u>MA.912.A.6.1:</u></a>	Simplify radical expressions
<a href="#"><u>MA.912.A.6.2:</u></a>	Add, subtract, multiply, and divide radical expressions (square roots and higher).
<a href="#"><u>MA.912.A.6.3:</u></a>	Simplify expressions using properties of rational exponents.
<a href="#"><u>MA.912.A.6.4:</u></a>	Convert between rational exponent and radical forms of expressions.
<a href="#"><u>MA.912.A.6.5:</u></a>	Solve equations that contain radical expressions.
<a href="#"><u>MA.912.A.7.1:</u></a>	Graph quadratic equations with and without graphing technology.
<a href="#"><u>MA.912.A.7.10:</u></a>	Use graphing technology to find approximate solutions of quadratic equations.
<a href="#"><u>MA.912.A.7.2:</u></a>	Solve quadratic equations over the real numbers by factoring and by using the quadratic formula.
<a href="#"><u>MA.912.A.7.3:</u></a>	Solve quadratic equations over the real numbers by completing the square.
<a href="#"><u>MA.912.A.7.4:</u></a>	Use the discriminant to determine the nature of the roots of a quadratic equation.
<a href="#"><u>MA.912.A.7.5:</u></a>	Solve quadratic equations over the complex number system.
<a href="#"><u>MA.912.A.7.6:</u></a>	Identify the axis of symmetry, vertex, domain, range and intercept(s) for a given parabola.
<a href="#"><u>MA.912.A.7.8:</u></a>	Use quadratic equations to solve real-world problems.

<a href="#"><u>MA.912.D.11.1:</u></a>	Define arithmetic and geometric sequences and series.
<a href="#"><u>MA.912.D.11.3:</u></a>	Find specified terms of arithmetic and geometric sequences.
<a href="#"><u>MA.912.G.2.3:</u></a>	Use properties of congruent and similar polygons to solve mathematical or real-world problems.
<a href="#"><u>MA.912.G.2.5:</u></a>	Explain the derivation and apply formulas for perimeter and area of polygons (triangles, quadrilaterals, pentagons, etc.).
<a href="#"><u>MA.912.G.4.4:</u></a>	Use properties of congruent and similar triangles to solve problems involving lengths and areas.
<a href="#"><u>MA.912.G.5.3:</u></a>	Use special right triangles ( $30^\circ - 60^\circ - 90^\circ$ and $45^\circ - 45^\circ - 90^\circ$ ) to solve problems.
<a href="#"><u>MA.912.G.5.4:</u></a>	Solve real-world problems involving right triangles.
<a href="#"><u>MA.912.G.6.5:</u></a>	Solve real-world problems using measures of circumference, arc length, and areas of circles and sectors.
<a href="#"><u>MA.912.G.7.5:</u></a>	Explain and use formulas for lateral area, surface area, and volume of solids.
<a href="#"><u>MA.912.G.7.7:</u></a>	Determine how changes in dimensions affect the surface area and volume of common geometric solids.

Course: 1205410 Applied Mathematics 2

## GENERAL INFORMATION

Course Number: 1205410  
Course Title: Applied Mathematics 2  
Abbreviated Title: APPLIED MATH 2  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Applied Mathematics »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Type: Core  
Course Level: 2  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.912.A.1.8: Use the zero product property of real numbers in a variety of contexts to identify solutions to equations.

- MA.912.A.10.1: Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guessing- and-checking, solving a simpler problem, writing an equation, working backwards, and creating a table.
- MA.912.A.10.2: Decide whether a solution is reasonable in the context of the original situation.
- MA.912.A.10.3: Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities, rational or radical expressions, or logarithmic or exponential functions).
- MA.912.A.3.13: Use a graph to approximate the solution of a system of linear equations or inequalities in two variables with and without technology.
- MA.912.A.3.14: Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods.
- MA.912.A.3.15: Solve real-world problems involving systems of linear equations and inequalities in two and three variables.
- MA.912.A.4.1: Simplify monomials and monomial expressions using the laws of integral exponents.
- MA.912.A.4.2: Add, subtract, and multiply polynomials.
- MA.912.A.4.3: Factor polynomial expressions.
- MA.912.A.4.4: Divide polynomials by monomials and polynomials with various techniques, including synthetic division.
- MA.912.A.5.1: Simplify algebraic ratios.
- MA.912.A.5.4: Solve algebraic proportions.
- MA.912.A.6.1: Simplify radical expressions.
- MA.912.A.6.2: Add, subtract, multiply, and divide radical expressions (square roots and higher).
- MA.912.A.7.1: Graph quadratic equations with and without graphing technology.
- MA.912.A.7.2: Solve quadratic equations over the real numbers by factoring and by using the quadratic formula.
- MA.912.A.7.8: Use quadratic equations to solve real-world problems.



- MA.912.A.7.10: Use graphing technology to find approximate solutions of quadratic equations.
- MA.912.G.2.5: Explain the derivation and apply formulas for perimeter and area of polygons (triangles, quadrilaterals, pentagons, etc.).
- MA.912.G.5.3: Use special right triangles ( $30^\circ - 60^\circ - 90^\circ$  and  $45^\circ - 45^\circ - 90^\circ$ ) to solve problems.
- MA.912.G.5.4: Solve real-world problems involving right triangles.
- MA.912.G.6.5: Solve real-world problems using measures of circumference, arc length, and areas of circles and sectors.
- MA.912.G.7.5: Explain and use formulas for lateral area, surface area, and volume of solids.
- MA.912.G.7.7: Determine how changes in dimensions affect the surface area and volume of common geometric solids
- MA.912.S.2.1: Compare the difference between surveys, experiments, and observational studies and what types of questions can and cannot be answered by a particular design.
- MA.912.S.2.2: Apply the definition of random sample and basic types of sampling, including representative samples, stratified samples, censuses
- MA.912.S.2.3: Identify sources of bias, including sampling and nonsampling errors.
- MA.912.S.3.9: Identify outliers in a set of data based on an appropriate graphical presentation of the data, and describe the effect of outliers on the mean, median, and range of the data.

Course: 1205400 Applied Mathematics 1

## GENERAL INFORMATION

Course Number: 1205400  
Course Title: Applied Mathematics 1  
Abbreviated Title: APPLIED MATH 1  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Applied Mathematics »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Type: Core  
Course Level: 2  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.912.A.10.1: Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guessing- and-checking, solving a simpler problem, writing an equation, working backwards, and creating a table.

- MA.912.A.10.2: Decide whether a solution is reasonable in the context of the original situation.
- MA.912.A.10.3: Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities, rational or radical expressions, or logarithmic or exponential functions).
- MA.912.A.2.3: Describe the concept of a function, use function notation, determine whether a given relation is a function, and link equations to functions.
- MA.912.A.2.4: Determine the domain and range of a relation.
- MA.912.A.2.13: Solve real-world problems involving relations and functions.
- MA.912.A.3.1: Solve linear equations in one variable that include simplifying algebraic expressions.
- MA.912.A.3.2: Identify and apply the distributive, associative, and commutative properties of real numbers and the properties of equality.
- MA.912.A.3.3: Solve literal equations for a specified variable.
- MA.912.A.3.4: Solve and graph simple and compound inequalities in one variable and be able to justify each step in a solution.
- MA.912.A.3.5: Symbolically represent and solve multi-step and real-world applications that involve linear equations and inequalities.
- MA.912.A.3.7: Rewrite equations of a line into slope-intercept form and standard form.
- MA.912.A.3.8: Graph a line given any of the following information: a table of values, the  $x$ - and  $y$ -intercepts, two points, the slope and a point, the equation of the line in slope-intercept form, standard form, or point-slope form.
- MA.912.A.3.9: Determine the slope,  $x$ -intercept, and  $y$ -intercept of a line given its graph, its equation, or two points on the line.
- MA.912.A.3.10: Write an equation of a line given any of the following information: two points on the line, its slope and one point on the line, or its graph. Also, find an equation of a new line parallel to a given line, or perpendicular to a given line, through a given point on the new line.
- MA.912.A.3.11: Write an equation of a line that models a data set, and use the equation or the graph to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change.

- MA.912.A.3.12: Graph a linear equation or inequality in two variables with and without graphing technology. Write an equation or inequality represented by a given graph.
- MA.912.D.7.1: Perform set operations such as union and intersection, complement, and cross product.
- MA.912.D.7.2: Use Venn diagrams to explore relationships and patterns and to make arguments about relationships between sets.
- MA.912.G.1.1: Find the lengths and midpoints of line segments in two-dimensional coordinate systems.
- MA.912.G.1.4: Use coordinate geometry to find slopes, parallel lines, perpendicular lines, and equations of lines.
- MA.912.G.2.3: Use properties of congruent and similar polygons to solve mathematical or real-world problems.
- MA.912.G.2.4: Apply transformations (translations, reflections, rotations, dilations, and scale factors) to polygons. to determine congruence, similarity, and symmetry. Know that images formed by translations, reflections, and rotations are congruent to the original shape. Create and verify tessellations of the plane using polygons.
- MA.912.G.3.1: Describe, classify, and compare relationships among quadrilaterals including the square, rectangle, rhombus, parallelogram, trapezoid, and kite.
- MA.912.G.4.4: Use properties of congruent and similar triangles to solve problems involving lengths and areas.

Course: 1205370 Consumer Mathematics

## GENERAL INFORMATION

Course Number: 1205370  
Course Title: Consumer Mathematics  
Abbreviated Title: CONSUMER MATH  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group:  
Grades 9 to 12 and Adult Education Courses » Subject:  
Mathematics » SubSubject: General Mathematics »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Level: 1  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.6.A.1.3: Solve real-world problems involving multiplication and division of fractions and decimals.

MA.6.A.3.1: Write and evaluate mathematical expressions that correspond to given situations.

MA.6.A.3.4: Solve problems given a formula.

- MA.6.A.5.1: Use equivalent forms of fractions, decimals, and percents to solve problems.
- MA.6.A.5.3: Estimate the results of computations with fractions, decimals, and percents, and judge the reasonableness of the results.
- MA.6.S.6.1: Determine the measures of central tendency (mean, median, mode) and variability (range) for a given set of data.
- MA.7.A.1.2: Solve percent problems, including problems involving discounts, simple interest, taxes, tips, and percents of increase or decrease.
- MA.7.G.4.4: Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)), dimensions, and derived units to solve problems.
- MA.8.A.6.4: Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, and irrational numbers) using multi-step and real world problems.
- MA.912.F.1.1: Explain the difference between simple and compound interest.
- MA.912.F.1.2: Solve problems involving compound interest.
- MA.912.F.2.1: Calculate the future value of a given amount of money with and without technology.
- MA.912.F.3.1: Compare the advantages and disadvantages of using cash versus a credit card.
- MA.912.F.3.3: Calculate the finance charges and total amount due on a credit card bill.
- MA.912.F.3.9: Calculate the total amount to be paid over the life of a fixed rate loan.
- MA.912.F.3.13: Calculate the total amount paid for the life of a loan for a house including the down payment, points, fees, and interest.
- MA.912.F.3.17: Compare interest rate calculations and annual percentage rate calculations to distinguish between the two rates.
- MA.912.F.4.1: Develop personal budgets that fit within various income brackets.
- MA.912.F.4.2: Explain cash management strategies including debit accounts, checking accounts, and savings accounts.
- MA.912.T.5.1: Use a variety of problem-solving strategies, such as drawing a diagram, guess-and-check, solving a simpler problem, examining simpler problems, and working backwards, using technology when appropriate.

MA.912.T.5.2:

Decide whether a solution is reasonable in the context of the original situation.

Course: 1202340 Pre-Calculus Honors

## GENERAL INFORMATION

Course Number: 1202340  
Course Title: Pre-Calculus Honors  
Abbreviated Title: PRE-CALCULUS HON  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Calculus »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Type: Core  
Course Level: 3  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.912.A.4.5: Graph polynomial functions with and without technology and describe end behavior.



- MA.912.A.4.6: Use theorems of polynomial behavior (including but not limited to the Fundamental Theorem of Algebra, Remainder Theorem, the Rational Root Theorem, Descartes' Rule of Signs, and the Conjugate Root Theorem) to find the zeros of a polynomial function.
- MA.912.A.4.7: Write a polynomial equation for a given set of real and/or complex roots.
- MA.912.A.4.8: Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression with and without technology.
- MA.912.A.5.6: Identify removable and non-removable discontinuities, and vertical, horizontal, and oblique asymptotes of a graph of a rational function, find the zeros, and graph the function.
- MA.912.A.9.1: Write the equations of conic sections in standard form and general form, in order to identify the conic section and to find its geometric properties (foci, asymptotes, eccentricity, etc.).
- MA.912.A.9.2: Graph conic sections with and without using graphing technology.
- MA.912.A.9.3: Solve real-world problems involving conic sections
- MA.912.C.1.1: Understand the concept of limit and estimate limits from graphs and tables of values.
- MA.912.C.1.2: Find limits by substitution.
- MA.912.C.1.3: Find limits of sums, differences, products, and quotients.
- MA.912.C.1.4: Find limits of rational functions that are undefined at a point.
- MA.912.C.1.5: Find one-sided limits.
- MA.912.C.1.9: Understand continuity in terms of limits.
- MA.912.C.1.10: Decide if a function is continuous at a point.
- MA.912.C.1.11: Find the types of discontinuities of a function.
- MA.912.C.1.12: Understand and use the Intermediate Value Theorem on a function over a closed interval.
- MA.912.C.1.13: Understand and apply the Extreme Value Theorem: If  $f(x)$  is continuous over a closed interval, then  $f$  has a maximum and a minimum on the interval.
- MA.912.D.1.3: Use mathematical induction to prove various concepts in number theory (such as sums of infinite integer series, divisibility statements, and parity statements), recurrence relations, and other applications.

- MA.912.D.10.1: Sketch the graph of a curve in the plane represented parametrically, indicating the direction of motion.
- MA.912.D.10.2: Convert from a parametric representation of a plane curve to a rectangular equation and vice-versa.
- MA.912.D.10.3: Use parametric equations to model applications of motion in the plane.
- MA.912.D.11.4: Find partial sums of arithmetic and geometric series, and find sums of infinite convergent geometric series. Use Sigma notation where applicable.
- MA.912.D.9.1: Demonstrate an understanding of the geometric interpretation of vectors and vector operations including addition, scalar multiplication, dot product, and cross product in the plane and in three-dimensional space.
- MA.912.D.9.2: Demonstrate an understanding of the algebraic interpretation of vectors and vector operations including addition, scalar multiplication, dot product, and cross product in the plane and in three-dimensional space.
- MA.912.D.9.3: Use vectors to model and solve application problems.
- MA.912.T.1.1: Convert between degree and radian measures.
- MA.912.T.1.2: Define and determine sine and cosine using the unit circle.
- MA.912.T.1.3: State and use exact values of trigonometric functions for special angles: multiples of  $\pi/6$  and  $\pi/4$  (degree and radian measures).
- MA.912.T.1.4: Find approximate values of trigonometric and inverse trigonometric functions using appropriate technology.
- MA.912.T.1.5: Make connections between right triangle ratios, trigonometric functions, and circular functions.
- MA.912.T.1.6: Define and graph trigonometric functions using domain, range, intercepts, period, amplitude, phase shift, vertical shift, and asymptotes with and without the use of graphing technology.
- MA.912.T.1.7: Define and graph inverse trigonometric relations and functions.
- MA.912.T.1.8: Solve real-world problems involving applications of trigonometric functions using graphing technology when appropriate.
- MA.912.T.2.1: Define and use the trigonometric ratios (sine, cosine, tangent, cotangent, secant, cosecant) in terms of angles of right triangles.
- MA.912.T.2.2: Solve real-world problems involving right triangles using technology when appropriate.
- MA.912.T.2.3: Apply the laws of sines and cosines to solve real-world problems using technology.

- MA.912.T.2.4: Use the area of triangles given two sides and an angle or three sides to solve real-world problems.
- MA.912.T.3.1: Verify the basic Pythagorean identities, such as  $\sin^2 x + \cos^2 x = 1$ , and show they are equivalent to the Pythagorean Theorem.
- MA.912.T.3.2: Use basic trigonometric identities to verify other identities and simplify expressions.
- MA.912.T.3.3: Use the sum and difference, half-angle and double-angle formulas for sine, cosine, and tangent, when formulas are provided.
- MA.912.T.3.4: Solve trigonometric equations and real-world problems involving applications of trigonometric equations using technology when appropriate.
- MA.912.T.4.1: Define polar coordinates and relate polar coordinates to Cartesian coordinates with and without the use of technology.
- MA.912.T.4.2: Represent equations given in rectangular coordinates in terms of polar coordinates.
- MA.912.T.4.3: Graph equations in the polar coordinate plane with and without the use of graphing technology.
- MA.912.T.4.4: Define the trigonometric form of complex numbers, convert complex numbers to trigonometric form, and multiply complex numbers in trigonometric form.
- MA.912.T.4.5: Apply DeMoivre's Theorem to perform operations with complex numbers.

Course: 1202300 Calculus Honors

## GENERAL INFORMATION

Course Number: 1202300  
Course Title: Calculus Honors  
Abbreviated Title: CALCULUS HON  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Calculus »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Type: Core  
Course Level: 3  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.912.C.1.6: Find limits at infinity.

- MA.912.C.1.7: Decide when a limit is infinite and use limits involving infinity to describe asymptotic behavior.
- MA.912.C.1.8: Find special limits such as
- MA.912.C.2.1: Understand the concept of derivative geometrically, numerically, and analytically, and interpret the derivative as an instantaneous rate of change or as the slope of the tangent line.
- MA.912.C.2.2: State, understand, and apply the definition of derivative.
- MA.912.C.2.3: Find the derivatives of functions, including algebraic, trigonometric, logarithmic, and exponential functions.
- MA.912.C.2.4: Find the derivatives of sums, products, and quotients.
- MA.912.C.2.5: Find the derivatives of composite functions using the Chain Rule.
- MA.912.C.2.6: Find the derivatives of implicitly-defined functions.
- MA.912.C.2.7: Find derivatives of inverse functions.
- MA.912.C.2.8: Find second derivatives and derivatives of higher order.
- MA.912.C.2.9: Find derivatives using logarithmic differentiation.
- MA.912.C.2.10: Understand and use the relationship between differentiability and continuity.
- MA.912.C.2.11: Understand and apply the Mean Value Theorem.
- MA.912.C.3.1: Find the slope of a curve at a point, including points at which there are vertical tangent lines and no tangent lines.
- MA.912.C.3.2: Find an equation for the tangent line to a curve at a point and a local linear approximation.
- MA.912.C.3.3: Decide where functions are decreasing and increasing. Understand the relationship between the increasing and decreasing behavior of  $f$  and the sign of  $f'$ .
- MA.912.C.3.4: Find local and absolute maximum and minimum points.
- MA.912.C.3.5: Find points of inflection of functions. Understand the relationship between the concavity of  $f$  and the sign of  $f''$ . Understand points of inflection as places where concavity changes.
- MA.912.C.3.6: Use first and second derivatives to help sketch graphs. Compare the corresponding characteristics of the graphs of  $f$ ,  $f'$ , and  $f''$ .
- MA.912.C.3.7: Use implicit differentiation to find the derivative of an inverse function.

- MA.912.C.3.8: Solve optimization problems.
- MA.912.C.3.9: Find average and instantaneous rates of change. Understand the instantaneous rate of change as the limit of the average rate of change. Interpret a derivative as a rate of change in applications, including velocity, speed, and acceleration.
- MA.912.C.3.10: Find the velocity and acceleration of a particle moving in a straight line.
- MA.912.C.3.11: Model rates of change, including related rates problems.
- MA.912.C.4.1: Use rectangle approximations to find approximate values of integrals.
- MA.912.C.4.2: Calculate the values of Riemann Sums over equal subdivisions using left, right, and midpoint evaluation points.
- MA.912.C.4.3: Interpret a definite integral as a limit of Riemann sums.
- MA.912.C.4.4: Interpret a definite integral of the rate of change of a quantity over an interval as the change of the quantity over the interval. That is,  $\int_a^b f'(x)dx = f(b) - f(a)$  (Fundamental Theorem of Calculus).
- MA.912.C.4.5: Use the Fundamental Theorem of Calculus to evaluate definite and indefinite integrals and to represent particular antiderivatives. Perform analytical and graphical analysis of functions so defined.
- MA.912.C.4.6: Use these properties of definite integrals:

- $\int_a^b [f(x) + g(x)]dx = \int_a^b f(x)dx + \int_a^b g(x)dx$
- $\int_a^b k \cdot f(x)dx = k \int_a^b f(x)dx$
- $\int_a^a f(x)dx = 0$
- $\int_a^b f(x)dx = - \int_b^a f(x)dx$
- $\int_a^b f(x)dx + \int_b^c f(x)dx = \int_a^c f(x)dx$
- If  $f(x) \leq g(x)$  on  $[a, b]$ , then  $\int_a^b f(x)dx \leq \int_a^b g(x)dx$

- MA.912.C.4.7: Use integration by substitution (or change of variable) to find values of integrals.
- MA.912.C.4.8: Use Riemann Sums, the Trapezoidal Rule, and technology to approximate definite integrals of functions represented algebraically, geometrically, and by tables of values.

- MA.912.C.5.1: Find specific antiderivatives using initial conditions, including finding velocity functions from acceleration functions, finding position functions from velocity functions, and solving applications related to motion along a line.
- MA.912.C.5.5: Use definite integrals to find the area between a curve and the x-axis or between two curves.
- MA.912.C.5.7: Use definite integrals to find the volume of a solid with known cross-sectional area, including solids of revolution.
- MA.912.C.5.8: Apply integration to model, and solve problems in physical, biological, and social sciences.

Course: 1201310 Analysis of Functions Honors

## GENERAL INFORMATION

Course Number: 1201310  
Course Title: Analysis of Functions Honors  
Abbreviated Title: ANALYSIS OF FUNC HON  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Mathematical Analysis »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Type: Core  
Course Level: 3  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.912.A.2.1: Create a graph to represent a real-world situation.



- MA.912.A.2.2: Interpret a graph representing a real-world situation.
- MA.912.A.2.4: Determine the domain and range of a relation.
- MA.912.A.2.6: Identify and graph common functions (including but not limited to linear, rational, quadratic, cubic, radical, absolute value).
- MA.912.A.2.9: Recognize, interpret, and graph functions defined piece-wise with and without technology.
- MA.912.A.2.10: Describe and graph transformations of functions
- MA.912.A.2.11: Solve problems involving functions and their inverses.
- MA.912.A.2.13: Solve real-world problems involving relations and functions.
- MA.912.A.4.5: Graph polynomial functions with and without technology and describe end behavior.
- MA.912.A.4.6: Use theorems of polynomial behavior (including but not limited to the Fundamental Theorem of Algebra, Remainder Theorem, the Rational Root Theorem, Descartes' Rule of Signs, and the Conjugate Root Theorem) to find the zeros of a polynomial function.
- MA.912.A.4.7: Write a polynomial equation for a given set of real and/or complex roots.
- MA.912.A.4.8: Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression with and without technology.
- MA.912.A.4.9: Use graphing technology to find approximate solutions for polynomial equations.
- MA.912.A.4.10: Use polynomial equations to solve real-world problems.
- MA.912.A.5.6: Identify removable and non-removable discontinuities, and vertical, horizontal, and oblique asymptotes of a graph of a rational function, find the zeros, and graph the function.
- MA.912.A.5.7: Solve real-world problems involving rational equations (mixture, distance, work, interest, and ratio).
- MA.912.A.8.3: Graph exponential and logarithmic functions.
- MA.912.A.8.7: Solve applications of exponential growth and decay.
- MA.912.T.1.1: Convert between degree and radian measures.
- MA.912.T.1.4: Find approximate values of trigonometric and inverse trigonometric functions using appropriate technology.

- MA.912.T.1.6: Define and graph trigonometric functions using domain, range, intercepts, period, amplitude, phase shift, vertical shift, and asymptotes with and without the use of graphing technology.
- MA.912.T.1.7: Define and graph inverse trigonometric relations and functions.
- MA.912.T.1.8: Solve real-world problems involving applications of trigonometric functions using graphing technology when appropriate.
- MA.912.T.2.1: Define and use the trigonometric ratios (sine, cosine, tangent, cotangent, secant, cosecant) in terms of angles of right triangles.

Course: 1201300 Mathematical Analysis Honors

## GENERAL INFORMATION

Course Number: 1201300  
Course Title: Mathematical Analysis Honors  
Abbreviated Title: MATH ANALYSIS HON  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Mathematical Analysis »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Type: Core  
Course Level: 3  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.912.A.2.1: Create a graph to represent a real-world situation.

- MA.912.A.2.2: Interpret a graph representing a real-world situation.
- MA.912.A.2.4: Determine the domain and range of a relation.
- MA.912.A.2.6: Identify and graph common functions (including but not limited to linear, rational, quadratic, cubic, radical, absolute value).
- MA.912.A.2.9: Recognize, interpret, and graph functions defined piece-wise with and without technology.
- MA.912.A.2.10: Describe and graph transformations of functions
- MA.912.A.3.14: Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods.
- MA.912.A.3.15: Solve real-world problems involving systems of linear equations and inequalities in two and three variables.
- MA.912.A.4.5: Graph polynomial functions with and without technology and describe end behavior.
- MA.912.A.4.6: Use theorems of polynomial behavior (including but not limited to the Fundamental Theorem of Algebra, Remainder Theorem, the Rational Root Theorem, Descartes' Rule of Signs, and the Conjugate Root Theorem) to find the zeros of a polynomial function.
- MA.912.A.4.7: Write a polynomial equation for a given set of real and/or complex roots.
- MA.912.A.4.8: Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression with and without technology.
- MA.912.A.4.9: Use graphing technology to find approximate solutions for polynomial equations.
- MA.912.A.4.10: Use polynomial equations to solve real-world problems.
- MA.912.A.5.6: Identify removable and non-removable discontinuities, and vertical, horizontal, and oblique asymptotes of a graph of a rational function, find the zeros, and graph the function.
- MA.912.A.5.7: Solve real-world problems involving rational equations (mixture, distance, work, interest, and ratio).
- MA.912.A.8.3: Graph exponential and logarithmic functions.
- MA.912.C.1.1: Understand the concept of limit and estimate limits from graphs and tables of values.
- MA.912.C.1.2: Find limits by substitution.
- MA.912.C.1.3: Find limits of sums, differences, products, and quotients.

- MA.912.C.1.4: Find limits of rational functions that are undefined at a point.
- MA.912.C.1.9: Understand continuity in terms of limits.
- MA.912.C.1.10: Decide if a function is continuous at a point.
- MA.912.C.1.11: Find the types of discontinuities of a function.
- MA.912.D.1.3: Use mathematical induction to prove various concepts in number theory (such as sums of infinite integer series, divisibility statements, and parity statements), recurrence relations, and other applications.
- MA.912.D.11.4: Find partial sums of arithmetic and geometric series, and find sums of infinite convergent geometric series. Use Sigma notation where applicable.
- MA.912.D.6.6: Construct logical arguments using laws of detachment (modus ponens), syllogism, tautology, and contradiction; judge the validity of arguments, and give counterexamples to disprove statements.
- MA.912.D.8.2: Use matrix operations to solve problems.
- MA.912.D.8.3: Use row-reduction techniques to solve problems.
- MA.912.D.8.4: Find the inverse of a matrix, and use the inverse to solve problems with and without the use of technology.
- MA.912.D.8.6: Use matrices to solve Markov chain problems that link present events to future events using probabilities.
- MA.912.P.1.1: Use counting principles, including the addition and the multiplication principles, to determine size of finite sample spaces and probabilities of events in those spaces.
- MA.912.P.1.2: Use formulas for permutations and combinations to count outcomes and determine probabilities of events.
- MA.912.P.2.3: Understand and use the concept of conditional probability, including: understanding how conditioning affects the probability of events and finding conditional probabilities from a two-way frequency table.
- MA.912.P.3.3: Apply the properties of the normal distribution.
- MA.912.S.3.3: Calculate and interpret measures of the center of a set of data, including mean, median, and weighted mean, and use these measures to make comparisons among sets of data.
- MA.912.S.3.4: Calculate and interpret measures of variance and standard deviation. Use these measures to make comparisons among sets of data.
- MA.912.S.3.6: Use empirical rules such as the 68-95-99.7 rule to estimate spread of distributions and to make comparisons among sets of data.

MA.912.S.3.8: Determine whether a data distribution is symmetric or skewed based on an appropriate graphical presentation of the data.

MA.912.S.3.9: Identify outliers in a set of data based on an appropriate graphical presentation of the data, and describe the effect of outliers on the mean, median, and range of the data.

Course: 1200700 Math for College Readiness

## GENERAL INFORMATION

Course Number: 1200700  
Course Title: Math for College Readiness  
Abbreviated Title: Math Coll. Readiness  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics»  
SubSubject: Algebra »  
Number of Credits: 1  
Course Length: Year  
Course Type: Core  
Course Level: 2  
Course Status: SBE Approval Pending  
General Notes: This course is targeted for grade 12 students, whose test scores on the Postsecondary Educational Readiness Test (P.E.R.T.) are at or below the established cut scores for mathematics, indicating that they are not yet “college ready” in mathematics or simply need some additional instruction in content to prepare them for success in college level mathematics. This course incorporates the Common Core Standards for Mathematical Practices as well as the following Common Core Standards for Mathematical Content: Expressions and Equations, The Number System, Functions, Algebra, Geometry, Number and Quantity, Statistics and Probability, and the Common Core Standards for High School Modeling. The standards align with the Mathematics Postsecondary Readiness Competencies deemed necessary for entry-level college courses.

## RELATED STANDARDS/BENCHMARKS

<b>MACC.K12.MP</b>	<b>Mathematical Practices</b>
MACC.K12.MP.1	Make sense of problems and persevere in solving them
MACC.K12.MP.2	Reason abstractly and quantitatively
MACC.K12.MP.3	Construct viable arguments and critique the reasoning of others
MACC.K12.MP.4	Model with mathematics
MACC.K12.MP.5	Use appropriate tools strategically
MACC.K12.MP.6	Attend to precision
MACC.K12.MP.7	Look for and make use of structure

MACC.K12.MP.8 Look for and express regularity in repeated reasoning

**MACC.7.EE**  
**MACC.7.EE.2**  
**MACC.7.EE.2.4b**

**Expressions and Equations**  
**Solve real-life and mathematical problems using numerical and algebraic expressions and equations**

Solve word problems leading to inequalities of the form  $px + q > r$  or  $px + q < r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example, As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.*

**MACC.7.NS**  
**MACC.7.NS.1**  
**MACC.7.NS.1.1**

**The Number System**  
**Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.**

Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

**MACC.7.NS.1.2**

Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

**MACC.8.EE**  
**MACC.8.EE.1**  
**MACC.8.EE.1.1**

**Expressions and Equations**  
**Work with radicals and integer exponents**

Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example,  $3^2 \times 3^{-5} = 3^{-3} = 1/(3^3) = 1/27$ .*

**MACC.8.EE.1.4**

Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

**MACC.8.EE.2**  
**MACC.8.EE.2.5**

**Understand the connections between proportional relationships, lines, and linear equations**

Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*

**MACC.8.F**  
**MACC.8.F.2**  
**MACC.8.F.2.4**

**Functions**  
**Use functions to model relationships between quantities**

Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function



from a description of a relationship or from two  $(x, y)$  values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

**MACC.8.NS**  
**MACC.8.NS.1**

**The Number System**

**Know that there are numbers that are not rational, and approximate them by rational numbers**

MACC.8.NS.1.1

Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.

MACC.8.NS.1.2

Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g.,  $\pi^2$ ). *For example, by truncating the decimal expansion of  $\sqrt{2}$  (square root of 2), show that  $\sqrt{2}$  is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*

**MACC.912.A-APR**  
**MACC.912.A-APR.1**

**Arithmetic with Polynomials and Rational Expressions**

**Perform arithmetic operations on polynomials**

MACC.912.A-APR.1.1

Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

**MACC.912.A-APR.2**

**Understand the relationship between zeros and factors of polynomials.**

MACC.912.A-APR.2.3

Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.

**MACC.912.A-APR.3**

**Use polynomial identities to solve problems.**

MACC.912.A-APR.3.4

Prove polynomial identities and use them to describe numerical relationships. *For example, the polynomial identity  $(x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2$  can be used to generate Pythagorean triples.*

**MACC.912.A-APR.4**

**Rewrite rational expressions.**

MACC.912.A-APR.4.6

Rewrite simple rational expressions in different forms; write  $a(x)/b(x)$  in the form  $q(x) + r(x)/b(x)$ , where  $a(x)$ ,  $b(x)$ ,  $q(x)$ , and  $r(x)$  are polynomials with the degree of  $r(x)$  less than the degree of  $b(x)$ , using inspection, long division, or, for the more complicated examples, a computer algebra system.

MACC.912.A-APR.4.7

Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.

- MACC.912.A-CED**      **Creating Equations**  
**MACC.912.A-CED.1**    **Create equations that describe numbers or relationships**  
MACC.912.A-CED.1.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.\*
- MACC.912.A-CED.1.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.\*
- MACC.912.A-CED.1.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.\**
- MACC.912.A-CED.1.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law  $V = IR$  to highlight resistance  $R$ .\**
- MACC.912.A-REI**      **Reasoning with Equations and Inequalities**  
**MACC.912.A-REI.1**    **Understand solving equations as a process of reasoning and explain the reasoning**  
MACC.912.A-REI.1.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
- MACC.912.A-REI.1.2 Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
- MACC.912.A-REI.2**    **Solve equations and inequalities in one variable**  
MACC.912.A-REI.2.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
- MACC.912.A-REI.2.4 Solve quadratic equations in one variable.
- MACC.912.A-REI.2.4a Use the method of completing the square to transform any quadratic equation in  $x$  into an equation of the form  $(x - p)^2 = q$  that has the same solutions. Derive the quadratic formula from this form.
- MACC.912.A-REI.2.4b Solve quadratic equations by inspection (e.g., for  $x^2 = 49$ ), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as  $a \pm bi$  for real numbers  $a$  and  $b$ .
- MACC.912.A-REI.3**    **Solve systems of equations**  
MACC.912.A-REI.3.5 Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.

MACC.912.A-REI.3.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

**MACC.912.A-REI.4 Represent and solve equations and inequalities graphically**

MACC.912.A-REI.4.10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

MACC.912.A-REI.4.11 Explain why the x-coordinates of the points where the graphs of the equations  $y = f(x)$  and  $y = g(x)$  intersect are the solutions of the equation  $f(x) = g(x)$ ; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where  $f(x)$  and/or  $g(x)$  are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.\*

**MACC.912.A-SSE Seeing Structure in Expressions**

**MACC.912.A-SSE.1 Interpret the structure of expressions**

MACC.912.A-SSE.1.1 Interpret expressions that represent a quantity in terms of its context.\*

MACC.912.A-SSE.1.1a Interpret parts of an expression, such as terms, factors, and coefficients.\*

MACC.912.A-SSE.1.1b Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret  $P(1+r)^n$  as the product of  $P$  and a factor not depending on  $P$ .*\*

MACC.912.A-SSE.1.2 Use the structure of an expression to identify ways to rewrite it. For example, see  $x^4 - y^4$  as  $(x^2)^2 - (y^2)^2$ , thus recognizing it as a difference of squares that can be factored as  $(x^2 - y^2)(x^2 + y^2)$ .

**MACC.912.A-SSE.2 Write expressions in equivalent forms to solve problems**

MACC.912.A-SSE.2.3 Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.\*

MACC.912.A-SSE.2.3a Factor a quadratic expression to reveal the zeros of the function it defines.\*

**MACC.912.F-IF Interpreting Functions**

**MACC.912.F-IF.1 Understand the concept of a function and use function notation**

MACC.912.F-IF.1.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If  $f$  is a function and  $x$  is an element of its domain, then  $f(x)$  denotes the output of  $f$  corresponding to the input  $x$ . The graph of  $f$  is the graph of the equation  $y = f(x)$ .

**MACC.912.F-IF.2 Interpret functions that arise in applications in terms of the context**

MACC.912.F-IF.2.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of

the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.\*

MACC.912.F-IF.2.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function  $h(n)$  gives the number of person-hours it takes to assemble  $n$  engines in a factory, then the positive integers would be an appropriate domain for the function.\**

MACC.912.F-IF.2.6 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.\*

**MACC.912.F-IF.3 Analyze functions using different representations**

MACC.912.F-IF.3.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.\*

MACC.912.F-IF.3.7a Graph linear and quadratic functions and show intercepts, maxima, and minima.\*

MACC.912.F-IF.3.8 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.

MACC.912.F-IF.3.8a Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.

**MACC.912.F-BF Building Functions**

**MACC.912.F-BF.1 Build a function that models a relationship between two quantities**

MACC.912.F-BF.1.1 Write a function that describes a relationship between two quantities.\*

MACC.912.F-BF.1.1a Determine an explicit expression, a recursive process, or steps for calculation from a context.\*

MACC.912.F-BF.1.1b Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.\*

**MACC.912.F-BF.2 Build new functions from existing functions.**

MACC.912.F-BF.2.3 Identify the effect on the graph of replacing  $f(x)$  by  $f(x) + k$ ,  $k f(x)$ ,  $f(kx)$ , and  $f(x + k)$  for specific values of  $k$  (both positive and negative); find the value of  $k$  given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.

**MACC.912.G-GPE Expressing Geometric Properties with Equations**

**MACC.912.G-GPE.2 Use coordinates to prove simple geometric theorems algebraically.**

MACC.912.G-GPE.2.5 Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).

MACC.912.G-GPE.2.6 Find the point on a directed line segment between two given points that partitions the segment in a given ratio.

MACC.912.G-GPE.2.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.\*

**MACC.912.N-Q Quantities\***

**MACC.912.N-Q.1 Reason quantitatively and use units to solve problems.**

MACC.912.N-Q.1.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.\*

MACC.912.N-Q.1.2 Define appropriate quantities for the purpose of descriptive modeling.\*

MACC.912.N-Q.1.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.\*

**MACC.912.N-RN The Real Number System**

**MACC.912.N-RN.1 Extend the properties of exponents to rational exponents**

MACC.912.N-RN.1.1 Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. *For example, we define  $5^{1/3}$  to be the cube root of 5 because we want  $[5^{1/3}]^3 = 5^{[(1/3) \times 3]}$  to hold, so  $[5^{1/3}]^3$  must equal 5.*

MACC.912.N-RN.1.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents.

**MACC.912.N-RN.2 Use Properties of rational and irrational numbers**

MACC.912.N-RN.2.3 Explain why the sum or product of rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.

**MACC.912.S-ID Interpreting Categorical and Quantitative Data**

**MACC.912.S-ID.2 Summarize, represent, and interpret data on two categorical and quantitative variables.**

MACC.912.S-ID.2.5 Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.\*

MACC.912.S-ID.2.6 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.\*

MACC.912.S-ID.2.6a Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.\*

MACC.912.S-ID.2.6b Informally assess the fit of a function by plotting and analyzing residuals.\*

MACC.912.S-ID.2.6c Fit a linear function for a scatter plot that suggests a linear association.\*

**MACC.912.S-ID.3 Interpret linear models**

MACC.912.S-ID.3.7 Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.\*

**Modeling standards:** *Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Making mathematical models is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol (\*).*

Course: 1200500 Advanced Algebra with Financial Applications

## GENERAL INFORMATION

Course Number: 200500  
Course Title: Advanced Algebra with Financial Applications  
Abbreviated Title: ADV ALG W/FIN APP  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Algebra »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Type: Core  
Course Level: 2  
Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.912.A.2.1: Create a graph to represent a real-world situation.

- MA.912.A.2.2: Interpret a graph representing a real-world situation.
- MA.912.A.3.5: Symbolically represent and solve multi-step and real-world applications that involve linear equations and inequalities.
- MA.912.A.3.15: Solve real-world problems involving systems of linear equations and inequalities in two and three variables.
- MA.912.A.8.7: Solve applications of exponential growth and decay.
- MA.912.D.1.1: Use recursive and iterative thinking to solve problems, including identification of patterns, population growth and decline, and compound interest.
- MA.912.F.1.1: Explain the difference between simple and compound interest.
- MA.912.F.1.2: Solve problems involving compound interest.
- MA.912.F.1.3: Demonstrate the relationship between simple interest and linear growth.
- MA.912.F.1.4: Demonstrate the relationship between compound interest and exponential growth.
- MA.912.F.2.1: Calculate the future value of a given amount of money with and without technology.
- MA.912.F.2.2: Calculate the present value of a certain amount of money for a given length of time in the future with and without technology.
- MA.912.F.3.1: Compare the advantages and disadvantages of using cash versus a credit card.
- MA.912.F.3.2: Analyze credit scores and reports.
- MA.912.F.3.3: Calculate the finance charges and total amount due on a credit card bill.
- MA.912.F.3.4: Compare the advantages and disadvantages of deferred payments.
- MA.912.F.3.5: Calculate deferred payments.
- MA.912.F.3.6: Calculate total cost of purchasing consumer durables over time given different down payments, financing options, and fees.
- MA.912.F.3.7: Calculate the following fees associated with a mortgage:
- discount points
  - origination fee
  - maximum brokerage fee on a net or gross loan
  - documentary stamps
  - prorated expenses (interest, county and/or city property taxes, and mortgage on an assumed mortgage)



- MA.912.F.3.9: Calculate the total amount to be paid over the life of a fixed rate loan.
- MA.912.F.3.10: Calculate the effects on the monthly payment in the change of interest rate based on an adjustable rate mortgage.
- MA.912.F.3.11: Calculate the final pay out amount for a balloon mortgage.
- MA.912.F.3.12: Compare the cost of paying a higher interest rate and lower points versus a lower interest rate and more points.
- MA.912.F.3.13: Calculate the total amount paid for the life of a loan for a house including the down payment, points, fees, and interest.
- MA.912.F.3.14: Compare the total cost for a set purchase price using a fixed rate, adjustable rate, and a balloon mortgage.
- MA.912.F.3.17: Compare interest rate calculations and annual percentage rate calculations to distinguish between the two rates.
- MA.912.F.4.1: Develop personal budgets that fit within various income brackets.
- MA.912.F.4.2: Explain cash management strategies including debit accounts, checking accounts, and savings accounts.
- MA.912.F.4.3: Calculate net worth.
- MA.912.F.4.4: Establish a plan to pay off debt.
- MA.912.F.4.5: Develop and apply a variety of strategies to use tax tables, and to determine, calculate, and complete yearly federal income tax.
- MA.912.F.4.6: Compare different insurance options and fees.
- MA.912.F.4.7: Compare and contrast the role of insurance as a device to mitigate risk and calculate expenses of various options.
- MA.912.F.4.8: Collect, organize, and interpret data to determine an effective retirement savings plan to meet personal financial goals.
- MA.912.F.4.9: Calculate, compare, and contrast different types of retirement plans, including IRAs, ROTH accounts, and annuities.
- MA.912.F.4.10: Analyze diversification in investments.
- MA.912.F.4.11: Purchase stock with a set amount of money, and follow the process through gains, losses, and selling.
- MA.912.F.4.12: Compare and contrast income from purchase of common stock, preferred stock, and bonds.
- MA.912.F.4.13: Given current exchange rates be able to convert from one form of currency to another.

- MA.912.S.3.1: Read and interpret data presented in various formats. Determine whether data is presented in appropriate format, and identify possible corrections. Formats to include:
- bar graphs
  - line graphs
  - stem and leaf plots
  - circle graphs
  - histograms
  - box and whiskers plots
  - scatter plots
  - cumulative frequency (ogive) graphs
- MA.912.S.3.3: Calculate and interpret measures of the center of a set of data, including mean, median, and weighted mean, and use these measures to make comparisons among sets of data.
- MA.912.T.5.1: Use a variety of problem-solving strategies, such as drawing a diagram, guess-and-check, solving a simpler problem, examining simpler problems, and working backwards, using technology when appropriate.
- MA.912.T.5.2: Decide whether a solution is reasonable in the context of the original situation.

Course: 1200410 Mathematics for College Success

## GENERAL INFORMATION

Course Number: 1200410  
Course Title: Mathematics for College Success  
Abbreviated Title: Math Coll. Success  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics» SubSubject: Algebra »  
Number of Credits: Half credit (0.5)  
Course Length: Semester  
Course Type: Elective  
Course Level: 2  
Course Status: SBE Approval Pending  
General Notes: This course is targeted for grade 12 students, whose test scores on the Postsecondary Educational Readiness Test (P.E.R.T.) are below the established cut scores for mathematics, indicating that they are not yet “college ready” in mathematics. This course incorporates the Common Core Standards for Mathematical Practices as well as the following Common Core Standards for Mathematical Content: Expressions and Equations, The Number System, Ratios and Proportional Relationships, Functions, Algebra, Geometry, Number and Quantity, Statistics and Probability, and the Common Core Standards for High School Modeling. The standards align with the Mathematics Postsecondary Readiness Competencies deemed necessary for entry-level college courses.

## RELATED STANDARDS/BENCHMARKS

<b>MACC.K12.MP</b>	<b>Mathematical Practices</b>
MACC.K12.MP.1	Make sense of problems and persevere in solving them
MACC.K12.MP.2	Reason abstractly and quantitatively
MACC.K12.MP.3	Construct viable arguments and critique the reasoning of others
MACC.K12.MP.4	Model with mathematics
MACC.K12.MP.5	Use appropriate tools strategically
MACC.K12.MP.6	Attend to precision
MACC.K12.MP.7	Look for and make use of structure
MACC.K12.MP.8	Look for and express regularity in repeated reasoning

**MACC.6.EE**  
**MACC.6.EE.1**

**Expressions and Equations**  
**Apply and extend previous understandings of arithmetic to algebraic expressions.**

MACC.6.EE.1.2c

Evaluate expressions at specific values for their variables. Include expressions that arise from formulas in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas  $V = s^3$  and  $A = 6s^2$  to find the volume and surface area of a cube with sides of length  $s = 1/2$ .*

**MACC.7.EE**  
**MACC.7.EE.2**

**Expressions and Equations**  
**Solve real-life and mathematical problems using numerical and algebraic expressions and equations.**

MACC.7.EE.2.3

Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations as strategies to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional  $1/10$  of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar  $9\ 3/4$  inches long in the center of a door that is  $27\ 1/2$  inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*

MACC.7.EE.2.4b

Solve word problems leading to inequalities of the form  $px + q > r$  or  $px + q < r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.*

**MACC.7.NS**  
**MACC.7.NS.1**

**The Number System**  
**Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.**

MACC.7.NS.1.1

Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

MACC.7.NS.1.2

Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

**MACC.7.RP**  
**MACC.7.RP.1**

**Ratios and Proportional Relationships**  
**Analyze proportional relationships and use them to solve real-world and mathematical problems.**

MACC.7.RP.1.3

Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns,*

*gratuities and commissions, fees, percent increase and decrease, percent error.*

**MACC.8.EE**  
**MACC.8.EE.1**  
MACC.8.EE.1.1

**Expressions and Equations**

**Work with radicals and integer exponents.**

Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example,  $3^2 \times 3^{-5} = 3^{-3} = 1/(3^3) = 1/27$ .*

MACC.8.EE.1.4

Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

**MACC.8.EE.2**

**Understand the connections between proportional relationships, lines, and linear equations.**

MACC.8.EE.2.5

Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*

**MACC.8.F**  
**MACC.8.F.2**  
MACC.8.F.2.4

**Functions**

**Use functions to model relationships between quantities.**

Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

**MACC.8.NS**  
**MACC.8.NS.1**

**The Number System**

**Know that there are numbers that are not rational, and approximate them by rational numbers.**

MACC.8.NS.1.1

Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.

MACC.8.NS.1.2

Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g.,  $\pi^2$ ). *For example, by truncating the decimal expansion of  $\sqrt{2}$ , show that  $\sqrt{2}$  is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*

**MACC.912.A-APR**  
**MACC.912.A-APR.1**

**Arithmetic with Polynomials and Rational Expressions**

**Perform arithmetic operations on polynomials**

- MACC.912.A-APR.1.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
- MACC.912.A-APR.2 Understand the relationship between zeros and factors of polynomials.**
- MACC.912.A-APR.2.3 Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.
- MACC.912.A-APR.3 Use polynomial identities to solve problems.**
- MACC.912.A-APR.3.4 Prove polynomial identities and use them to describe numerical relationships. *For example, the polynomial identity  $(x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2$  can be used to generate Pythagorean triples.*
- MACC.912.A-APR.4 Rewrite rational expressions**
- MACC.912.A-APR.4.7 Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.
- MACC.912.A-CED Creating Equations\***
- MACC.912.A-CED.1 Create equations that describe numbers or relationships\***
- MACC.912.A-CED.1.1 Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions.\**
- MACC.912.A-CED.1.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.\*
- MACC.912.A-CED.1.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.\**
- MACC.912.A-CED.1.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law  $V = IR$  to highlight resistance  $R$ .\**
- MACC.912.A-REI Reasoning with Equations and Inequalities**
- MACC.912.A-REI.1 Understand solving equations as a process of reasoning and explain the reasoning**
- MACC.912.A-REI.1.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
- MACC.912.A-REI.1.2 Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.

<b>MACC.912.A-REI.2</b>	<b>Solve equations and inequalities in one variable</b>
MACC.912.A-REI.2.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
MACC.912.A-REI.2.4	Solve quadratic equations in one variable.
MACC.912.A-REI.2.4b	Solve quadratic equations by inspection (e.g., for $x^2 = 49$ ), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers $a$ and $b$ .
<b>MACC.912.A-REI.3</b>	<b>Solve systems of equations.</b>
MACC.912.A-REI.3.5	Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.
MACC.912.A-REI.3.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
<b>MACC.912.A-REI.4</b>	<b>Represent and solve equations and inequalities graphically</b>
MACC.912.A-REI.4.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
MACC.912.A-REI.4.11	Explain why the $x$ -coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$ ; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.*
<b>MACC.912.A-SSE</b>	<b>Seeing Structure in Expressions</b>
<b>MACC.912.A-SSE.1</b>	<b>Interpret the structure of expressions</b>
MACC.912.A-SSE.1.1	Interpret expressions that represent a quantity in terms of its context.*
MACC.912.A-SSE.1.1a	Interpret parts of an expression, such as terms, factors, and coefficients.*
MACC.912.A-SSE.1.1b	Interpret complicated expressions by viewing one or more of their parts as a single entity. <i>For example, interpret <math>P(1+r)^n</math> as the product of <math>P</math> and a factor not depending on <math>P</math>.</i> *
MACC.912.A-SSE.1.2	Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$ , thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$ .
<b>MACC.912.A-SSE.2</b>	<b>Write expressions in equivalent forms to solve problems</b>

MACC.912.A-SSE.2.3 Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.\*

MACC.912.A-SSE.2.3a Factor a quadratic expression to reveal the zeros of the function it defines.\*

**MACC.912.F-IF**

**MACC.912.F-IF.1**

MACC.912.F-IF.1.1

**Interpreting Functions**

**Understand the concept of a function and use function notation.**

Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If  $f$  is a function and  $x$  is an element of its domain, then  $f(x)$  denotes the output of  $f$  corresponding to the input  $x$ . The graph of  $f$  is the graph of the equation  $y = f(x)$ .

**MACC.912.F-IF.2**

**Interpret functions that arise in applications in terms of the context.**

MACC.912.F-IF.2.4

For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.\*

MACC.912.F-IF.2.5

Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function  $h(n)$  gives the number of person-hours it takes to assemble  $n$  engines in a factory, then the positive integers would be an appropriate domain for the function.\*

MACC.912.F-IF.2.6

Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.\*

**MACC.912.F-IF.3**

MACC.912.F-IF.3.7

**Analyze functions using different representations**

Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.\*

MACC.912.F-IF.3.7a

Graph linear and quadratic functions and show intercepts, maxima, and minima.\*

MACC.912.F-IF.3.8

Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.

**MACC.912.F-BF**

**MACC.912.F-BF.1**

MACC.912.F-BF.1.1

**Building Functions**

**Build a function that models a relationship between two quantities.**

Write a function that describes a relationship between two quantities.\*

**MACC.912.F-BF.2**

**Build new functions from existing functions.**



MACC.912.F-BF.2.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$ , $k f(x)$ , $f(kx)$ , and $f(x + k)$ for specific values of $k$ (both positive and negative); find the value of $k$ given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.
<b>MACC.912.G-GPE</b> <b>MACC.912.G-GPE.2</b>	<b>Expressing Geometric Properties with Equations</b> <b>Use coordinates to prove simple geometric theorems algebraically.</b>
MACC.912.G-GPE.2.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).
<b>MACC.912.N-Q</b> <b>MACC.912.N-Q.1</b> MACC.912.N-Q.1.1	<b>Quantities*</b> <b>Reason quantitatively and use units to solve problems.</b> Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.*
MACC.912.N-Q.1.2	Define appropriate quantities for the purpose of descriptive modeling.*
MACC.912.N-Q.1.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.*
<b>MACC.912.N-RN</b> <b>MACC.912.N-RN.1</b> MACC.912.N-RN.1.2	<b>The Real Number System</b> <b>Extend the properties of exponents to rational exponents.</b> Rewrite expressions involving radicals and rational exponents using the properties of exponents.
<b>MACC.912.S-ID</b> <b>MACC.912.S-ID.2</b>	<b>Interpreting Categorical and Quantitative Data</b> <b>Summarize, represent, and interpret data on two categorical and quantitative variables.</b>
MACC.912.S-ID.2.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.*
MACC.912.S-ID.2.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.*
MACC.912.S-ID.2.6a	Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.*
<b>MACC.912.S-ID.3</b> MACC.912.S-ID.3.7	<b>Interpret linear models*</b> Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.*

**Modeling standards**

*Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Making mathematical models is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol (\*).*

DRAFT

Course: 1200385 Algebra 1-B for Credit Recovery

## GENERAL INFORMATION

Course Number:	1200385
Course Title:	Algebra 1-B for Credit Recovery
Abbreviated Title:	ALG 1-B CR
Course Path:	Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Algebra »
Number of Credits:	One credit (1)
Course Length:	Varies
Course Type:	Core
Course Level:	2
Course Status:	SBE Approval Pending
Special Notes:	<i>Credit Recovery courses are credit bearing courses with specific content requirements defined by Next Generation Sunshine State Standards and/or Common Core State Standards. Students enrolled in a Credit Recovery course must have previously attempted the corresponding course (and/or End-of-Course assessment) since the course requirements for the Credit Recovery course are exactly the same as the previously attempted corresponding course. For example, Geometry (1206310) and Geometry for Credit Recovery (1206315) have identical content requirements. It is important to note that Credit Recovery courses are not bound by Section 1003.436(1)(a), Florida Statutes, requiring a minimum of 135 hours of bona fide instruction (120 hours in a school/district implementing block scheduling) in a designed course of study that contains student performance standards, since the students have previously attempted successful completion of the corresponding course. Additionally, Credit Recovery courses should ONLY be used for credit recovery, grade forgiveness, or remediation for students needing to prepare for an End-of-Course assessment retake.</i>

## RELATED STANDARDS/BENCHMARKS

<b>LACC.910.RST.2</b>	<b>Craft and Structure</b>
LACC.910.RST.2.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
<b>LACC.1112.RST.2</b>	<b>Craft and Structure</b>
LACC.1112.RST.2.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3**      **Integration of Knowledge and Ideas**  
LACC.910.RST.3.7      Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3**      **Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7      Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## **NEXT GENERATION SUNSHINE STATE STANDARDS**

- MA.912.A.1.8:              Use the zero product property of real numbers in a variety of contexts to identify solutions to equations.
- MA.912.A.10.1:            Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guessing- and-checking, solving a simpler problem, writing an equation, working backwards, and creating a table.
- MA.912.A.10.2:            Decide whether a solution is reasonable in the context of the original situation.
- MA.912.A.10.3:            Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities, rational or radical expressions, or logarithmic or exponential functions).
- MA.912.A.3.13:            Use a graph to approximate the solution of a system of linear equations or inequalities in two variables with and without technology.
- MA.912.A.3.14:            Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods.
- MA.912.A.3.15:            Solve real-world problems involving systems of linear equations and inequalities in two and three variables.
- MA.912.A.4.1:            Simplify monomials and monomial expressions using the laws of integral exponents.
- MA.912.A.4.2:            Add, subtract, and multiply polynomials.
- MA.912.A.4.3:            Factor polynomial expressions.
- MA.912.A.4.4:            Divide polynomials by monomials and polynomials with various techniques, including synthetic division.
- MA.912.A.5.1:            Simplify algebraic ratios.
- MA.912.A.5.4:            Solve algebraic proportions.

- MA.912.A.6.1: Simplify radical expressions
- MA.912.A.6.2: Add, subtract, multiply, and divide radical expressions (square roots and higher).
- MA.912.A.7.1: Graph quadratic equations with and without graphing technology.
- MA.912.A.7.2: Solve quadratic equations over the real numbers by factoring and by using the quadratic formula.
- MA.912.A.7.8: Use quadratic equations to solve real-world problems.
- MA.912.A.7.10: Use graphing technology to find approximate solutions of quadratic equations.

Course: 1200380 Algebra 1-B

## GENERAL INFORMATION

Course Number: 1200380  
Course Title: Algebra 1-B  
Abbreviated Title: ALG 1-B  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Algebra »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Type: Core  
Course Level: 2  
Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.912.A.1.8: Use the zero product property of real numbers in a variety of contexts to identify solutions to equations.

- MA.912.A.10.1: Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guessing- and-checking, solving a simpler problem, writing an equation, working backwards, and creating a table.
- MA.912.A.10.2: Decide whether a solution is reasonable in the context of the original situation.
- MA.912.A.10.3: Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities, rational or radical expressions, or logarithmic or exponential functions).
- MA.912.A.3.13: Use a graph to approximate the solution of a system of linear equations or inequalities in two variables with and without technology.
- MA.912.A.3.14: Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods.
- MA.912.A.3.15: Solve real-world problems involving systems of linear equations and inequalities in two and three variables.
- MA.912.A.4.1: Simplify monomials and monomial expressions using the laws of integral exponents.
- MA.912.A.4.2: Add, subtract, and multiply polynomials.
- MA.912.A.4.3: Factor polynomial expressions.
- MA.912.A.4.4: Divide polynomials by monomials and polynomials with various techniques, including synthetic division.
- MA.912.A.5.1: Simplify algebraic ratios.
- MA.912.A.5.4: Solve algebraic proportions.
- MA.912.A.6.1: Simplify radical expressions
- MA.912.A.6.2: Add, subtract, multiply, and divide radical expressions (square roots and higher).
- MA.912.A.7.1: Graph quadratic equations with and without graphing technology.
- MA.912.A.7.2: Solve quadratic equations over the real numbers by factoring and by using the quadratic formula.
- MA.912.A.7.8: Use quadratic equations to solve real-world problems.
- MA.912.A.7.10: Use graphing technology to find approximate solutions of quadratic equations.

Course: 1200375 Algebra 1-A for Credit Recovery

## GENERAL INFORMATION

Course Number:	1200375
Course Title:	Algebra 1-A for Credit Recovery
Abbreviated Title:	ALG 1-A CR
Course Path:	Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Algebra »
Number of Credits:	One credit (1)
Course Length:	Varies
Course Type:	Core
Course Level:	2
Course Status:	SBE Approval Pending
Special Notes:	<i>Credit Recovery courses are credit bearing courses with specific content requirements defined by Next Generation Sunshine State Standards and/or Common Core State Standards. Students enrolled in a Credit Recovery course must have previously attempted the corresponding course (and/or End-of-Course assessment) since the course requirements for the Credit Recovery course are exactly the same as the previously attempted corresponding course. For example, Geometry (1206310) and Geometry for Credit Recovery (1206315) have identical content requirements. It is important to note that Credit Recovery courses are not bound by Section 1003.436(1)(a), Florida Statutes, requiring a minimum of 135 hours of bona fide instruction (120 hours in a school/district implementing block scheduling) in a designed course of study that contains student performance standards, since the students have previously attempted successful completion of the corresponding course. Additionally, Credit Recovery courses should ONLY be used for credit recovery, grade forgiveness, or remediation for students needing to prepare for an End-of-Course assessment retake.</i>

## RELATED STANDARDS/BENCHMARKS

<b>LACC.910.RST.2</b>	<b>Craft and Structure</b>
LACC.910.RST.2.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.



**LACC.1112.RST.2 Craft and Structure**

LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**

LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**

LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

**NEXT GENERATION SUNSHINE STATE STANDARDS**

MA.912.A.1.1: Know equivalent forms of real numbers (including integer exponents and radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers).

MA.912.A.1.2: Compare real number expressions.

MA.912.A.1.3: Simplify real number expressions using the laws of exponents.

MA.912.A.1.4: Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers) using multi-step and real-world problems.

MA.912.A.1.5: Use dimensional (unit) analysis to perform conversions between units of measure, including rates.

MA.912.A.10.1: Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guessing- and-checking, solving a simpler problem, writing an equation, working backwards, and creating a table.

MA.912.A.10.2: Decide whether a solution is reasonable in the context of the original situation.

MA.912.A.10.3: Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities, rational or radical expressions, or logarithmic or exponential functions).

MA.912.A.2.1: Create a graph to represent a real-world situation.

MA.912.A.2.2: Interpret a graph representing a real-world situation.

MA.912.A.2.3: Describe the concept of a function, use function notation, determine whether a given relation is a function, and link equations to functions.

- MA.912.A.2.4: Determine the domain and range of a relation.
- MA.912.A.2.13: Solve real-world problems involving relations and functions.
- MA.912.A.3.1: Solve linear equations in one variable that include simplifying algebraic expressions.
- MA.912.A.3.2: Identify and apply the distributive, associative, and commutative properties of real numbers and the properties of equality.
- MA.912.A.3.3: Solve literal equations for a specified variable.
- MA.912.A.3.4: Solve and graph simple and compound inequalities in one variable and be able to justify each step in a solution.
- MA.912.A.3.5: Symbolically represent and solve multi-step and real-world applications that involve linear equations and inequalities.
- MA.912.A.3.7: Rewrite equations of a line into slope-intercept form and standard form.
- MA.912.A.3.8: Graph a line given any of the following information: a table of values, the x- and y-intercepts, two points, the slope and a point, the equation of the line in slope-intercept form, standard form, or point-slope form .
- MA.912.A.3.9: Determine the slope, x-intercept, and y-intercept of a line given its graph, its equation, or two points on the line.
- MA.912.A.3.10: Write an equation of a line given any of the following information: two points on the line, its slope and one point on the line, or its graph. Also, find an equation of a new line parallel to a given line, or perpendicular to a given line, through a given point on the new line.
- MA.912.A.3.11: Write an equation of a line that models a data set, and use the equation or the graph to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change.
- MA.912.A.3.12: Graph a linear equation or inequality in two variables with and without graphing technology. Write an equation or inequality represented by a given graph.
- MA.912.D.7.1: Perform set operations such as union and intersection, complement, and cross product.
- MA.912.D.7.2: Use Venn diagrams to explore relationships and patterns and to make arguments about relationships between sets.
- MA.912.G.1.4: Use coordinate geometry to find slopes, parallel lines, perpendicular lines, and equations of lines.

Course: 1200370 Algebra 1-A

## GENERAL INFORMATION

Course Number: 1200370  
Course Title: Algebra 1-A  
Abbreviated Title: ALG 1-A  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Algebra »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Type: Core  
Course Level: 2  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.912.A.1.1: Know equivalent forms of real numbers (including integer exponents and radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers).

- MA.912.A.1.2: Compare real number expressions.
- MA.912.A.1.3: Simplify real number expressions using the laws of exponents.
- MA.912.A.1.4: Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers) using multi-step and real-world problems.
- MA.912.A.1.5: Use dimensional (unit) analysis to perform conversions between units of measure, including rates.
- MA.912.A.10.1: Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guessing- and-checking, solving a simpler problem, writing an equation, working backwards, and creating a table.
- MA.912.A.10.2: Decide whether a solution is reasonable in the context of the original situation.
- MA.912.A.10.3: Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities, rational or radical expressions, or logarithmic or exponential functions).
- MA.912.A.2.1: Create a graph to represent a real-world situation.
- MA.912.A.2.2: Interpret a graph representing a real-world situation.
- MA.912.A.2.3: Describe the concept of a function, use function notation, determine whether a given relation is a function, and link equations to functions.
- MA.912.A.2.4: Determine the domain and range of a relation.
- MA.912.A.2.13: Solve real-world problems involving relations and functions.
- MA.912.A.3.1: Solve linear equations in one variable that include simplifying algebraic expressions.
- MA.912.A.3.2: Identify and apply the distributive, associative, and commutative properties of real numbers and the properties of equality.
- MA.912.A.3.3: Solve literal equations for a specified variable.
- MA.912.A.3.4: Solve and graph simple and compound inequalities in one variable and be able to justify each step in a solution.
- MA.912.A.3.5: Symbolically represent and solve multi-step and real-world applications that involve linear equations and inequalities.
- MA.912.A.3.7: Rewrite equations of a line into slope-intercept form and standard form.

- MA.912.A.3.8: Graph a line given any of the following information: a table of values, the x- and y-intercepts, two points, the slope and a point, the equation of the line in slope-intercept form, standard form, or point-slope form .
- MA.912.A.3.9: Determine the slope, x-intercept, and y-intercept of a line given its graph, its equation, or two points on the line.
- MA.912.A.3.10: Write an equation of a line given any of the following information: two points on the line, its slope and one point on the line, or its graph. Also, find an equation of a new line parallel to a given line, or perpendicular to a given line, through a given point on the new line.
- MA.912.A.3.11: Write an equation of a line that models a data set, and use the equation or the graph to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change.
- MA.912.A.3.12: Graph a linear equation or inequality in two variables with and without graphing technology. Write an equation or inequality represented by a given graph.
- MA.912.D.7.1: Perform set operations such as union and intersection, complement, and cross product.
- MA.912.D.7.2: Use Venn diagrams to explore relationships and patterns and to make arguments about relationships between sets.
- MA.912.G.1.4: Use coordinate geometry to find slopes, parallel lines, perpendicular lines, and equations of lines.

Course: 1200340 Algebra 2 Honors

## GENERAL INFORMATION

Course Number: 1200340  
Course Title: Algebra 2 Honors  
Abbreviated Title: ALG 2 HON  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Algebra »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Type: Core  
Course Level: 3  
Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.912.A.1.6: Identify the real and imaginary parts of complex numbers and perform basic operations.

- MA.912.A.10.3: Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities, rational or radical expressions, or logarithmic or exponential functions).
- MA.912.A.2.5: Graph absolute value equations and inequalities in two variables.
- MA.912.A.2.6: Identify and graph common functions (including but not limited to linear, rational, quadratic, cubic, radical, absolute value).
- MA.912.A.2.7: Perform operations (addition, subtraction, division, and multiplication) of functions algebraically, numerically, and graphically.
- MA.912.A.2.8: Determine the composition of functions.
- MA.912.A.2.9: Recognize, interpret, and graph functions defined piece-wise with and without technology.
- MA.912.A.2.10: Describe and graph transformations of functions
- MA.912.A.2.11: Solve problems involving functions and their inverses.
- MA.912.A.2.12: Solve problems using direct, inverse, and joint variations.
- MA.912.A.3.14: Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods.
- MA.912.A.3.15: Solve real-world problems involving systems of linear equations and inequalities in two and three variables.
- MA.912.A.4.3: Factor polynomial expressions.
- MA.912.A.4.4: Divide polynomials by monomials and polynomials with various techniques, including synthetic division.
- MA.912.A.4.5: Graph polynomial functions with and without technology and describe end behavior.
- MA.912.A.4.6: Use theorems of polynomial behavior (including but not limited to the Fundamental Theorem of Algebra, Remainder Theorem, the Rational Root Theorem, Descartes' Rule of Signs, and the Conjugate Root Theorem) to find the zeros of a polynomial function.
- MA.912.A.4.7: Write a polynomial equation for a given set of real and/or complex roots.
- MA.912.A.4.8: Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression with and without technology.
- MA.912.A.4.9: Use graphing technology to find approximate solutions for polynomial equations.

- MA.912.A.4.10: Use polynomial equations to solve real-world problems.
- MA.912.A.4.11: Solve a polynomial inequality by examining the graph with and without the use of technology.
- MA.912.A.4.12: Apply the Binomial Theorem.
- MA.912.A.5.6: Identify removable and non-removable discontinuities, and vertical, horizontal, and oblique asymptotes of a graph of a rational function, find the zeros, and graph the function.
- MA.912.A.6.2: Add, subtract, multiply, and divide radical expressions (square roots and higher).
- MA.912.A.6.3: Simplify expressions using properties of rational exponents.
- MA.912.A.6.4: Convert between rational exponent and radical forms of expressions.
- MA.912.A.6.5: Solve equations that contain radical expressions.
- MA.912.A.7.3: Solve quadratic equations over the real numbers by completing the square.
- MA.912.A.7.4: Use the discriminant to determine the nature of the roots of a quadratic equation.
- MA.912.A.7.5: Solve quadratic equations over the complex number system.
- MA.912.A.7.6: Identify the axis of symmetry, vertex, domain, range and intercept(s) for a given parabola.
- MA.912.A.7.7: Solve non-linear systems of equations with and without using technology.
- MA.912.A.7.10: Use graphing technology to find approximate solutions of quadratic equations.
- MA.912.A.8.1: Define exponential and logarithmic functions and determine their relationship
- MA.912.A.8.2: Define and use the properties of logarithms to simplify logarithmic expressions and to find their approximate values.
- MA.912.A.8.3: Graph exponential and logarithmic functions.
- MA.912.A.8.5: Solve logarithmic and exponential equations.
- MA.912.A.8.6: Use the change of base formula.
- MA.912.A.8.7: Solve applications of exponential growth and decay.



- MA.912.A.9.1: Write the equations of conic sections in standard form and general form, in order to identify the conic section and to find its geometric properties (foci, asymptotes, eccentricity, etc.).
- MA.912.A.9.2: Graph conic sections with and without using graphing technology.
- MA.912.D.11.1: Define arithmetic and geometric sequences and series.
- MA.912.D.11.2: Use sigma notation to describe series.
- MA.912.D.11.3: Find specified terms of arithmetic and geometric sequences.
- MA.912.D.11.4: Find partial sums of arithmetic and geometric series, and find sums of infinite convergent geometric series. Use Sigma notation where applicable.
- MA.912.G.6.6: Given the center and the radius, find the equation of a circle in the coordinate plane or given the equation of a circle in center-radius form, state the center and the radius of the circle.
- MA.912.G.6.7: Given the equation of a circle in center-radius form or given the center and the radius of a circle, sketch the graph of the circle.

Course: 1200335 Algebra 2 for Credit Recovery

## GENERAL INFORMATION

Course Number:	1200335
Course Title:	Algebra 2 for Credit Recovery
Abbreviated Title:	ALG 2 CR
Course Path:	Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Algebra »
Number of Credits:	One credit (1)
Course Length:	Varies
Course Type:	Core
Course Level:	2
Course Status:	SBE Approval Pending
Special Notes:	<i>Credit Recovery courses are credit bearing courses with specific content requirements defined by Next Generation Sunshine State Standards and/or Common Core State Standards. Students enrolled in a Credit Recovery course must have previously attempted the corresponding course (and/or End-of-Course assessment) since the course requirements for the Credit Recovery course are exactly the same as the previously attempted corresponding course. For example, Geometry (1206310) and Geometry for Credit Recovery (1206315) have identical content requirements. It is important to note that Credit Recovery courses are not bound by Section 1003.436(1)(a), Florida Statutes, requiring a minimum of 135 hours of bona fide instruction (120 hours in a school/district implementing block scheduling) in a designed course of study that contains student performance standards, since the students have previously attempted successful completion of the corresponding course. Additionally, Credit Recovery courses should ONLY be used for credit recovery, grade forgiveness, or remediation for students needing to prepare for an End-of-Course assessment retake.</i>

## RELATED STANDARDS/BENCHMARKS

<b>LACC.910.RST.2</b>	<b>Craft and Structure</b>
LACC.910.RST.2.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**

LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**

LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**

LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

**NEXT GENERATION SUNSHINE STATE STANDARDS**

MA.912.A.1.6: Identify the real and imaginary parts of complex numbers and perform basic operations.

MA.912.A.10.3: Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities, rational or radical expressions, or logarithmic or exponential functions).

MA.912.A.2.5: Graph absolute value equations and inequalities in two variables.

MA.912.A.2.6: Identify and graph common functions (including but not limited to linear, rational, quadratic, cubic, radical, absolute value).

MA.912.A.2.7: Perform operations (addition, subtraction, division, and multiplication) of functions algebraically, numerically, and graphically.

MA.912.A.2.8: Determine the composition of functions.

MA.912.A.2.10: Describe and graph transformations of functions

MA.912.A.2.11: Solve problems involving functions and their inverses.

MA.912.A.2.12: Solve problems using direct, inverse, and joint variations.

MA.912.A.3.3: Solve literal equations for a specified variable.

MA.912.A.3.6: Solve and graph the solutions of absolute value equations and inequalities with one variable.

MA.912.A.3.10: Write an equation of a line given any of the following information: two points on the line, its slope and one point on the line, or its graph. Also, find an equation of a new line parallel to a given line, or perpendicular to a given line, through a given point on the new line.

- MA.912.A.3.14: Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods.
- MA.912.A.3.15: Solve real-world problems involving systems of linear equations and inequalities in two and three variables.
- MA.912.A.4.3: Factor polynomial expressions.
- MA.912.A.4.4: Divide polynomials by monomials and polynomials with various techniques, including synthetic division.
- MA.912.A.4.5: Graph polynomial functions with and without technology and describe end behavior.
- MA.912.A.4.6: Use theorems of polynomial behavior (including but not limited to the Fundamental Theorem of Algebra, Remainder Theorem, the Rational Root Theorem, Descartes' Rule of Signs, and the Conjugate Root Theorem) to find the zeros of a polynomial function.
- MA.912.A.4.7: Write a polynomial equation for a given set of real and/or complex roots.
- MA.912.A.4.8: Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression with and without technology.
- MA.912.A.4.9: Use graphing technology to find approximate solutions for polynomial equations.
- MA.912.A.4.10: Use polynomial equations to solve real-world problems.
- MA.912.A.5.2: Add, subtract, multiply, and divide rational expressions.
- MA.912.A.5.3: Simplify complex fractions.
- MA.912.A.5.5: Solve rational equations.
- MA.912.A.6.2: Add, subtract, multiply, and divide radical expressions (square roots and higher).
- MA.912.A.6.3: Simplify expressions using properties of rational exponents.
- MA.912.A.6.4: Convert between rational exponent and radical forms of expressions.
- MA.912.A.6.5: Solve equations that contain radical expressions.
- MA.912.A.7.3: Solve quadratic equations over the real numbers by completing the square.
- MA.912.A.7.4: Use the discriminant to determine the nature of the roots of a quadratic equation.
- MA.912.A.7.5: Solve quadratic equations over the complex number system.

- MA.912.A.7.6: Identify the axis of symmetry, vertex, domain, range and intercept(s) for a given parabola.
- MA.912.A.8.1: Define exponential and logarithmic functions and determine their relationship
- MA.912.A.8.2: Define and use the properties of logarithms to simplify logarithmic expressions and to find their approximate values.
- MA.912.A.8.3: Graph exponential and logarithmic functions.
- MA.912.A.8.5: Solve logarithmic and exponential equations.
- MA.912.A.8.6: Use the change of base formula.
- MA.912.A.8.7: Solve applications of exponential growth and decay.
- MA.912.D.11.1: Define arithmetic and geometric sequences and series.
- MA.912.D.11.3: Find specified terms of arithmetic and geometric sequences.

Course: 1200330 Algebra 2

## GENERAL INFORMATION

Course Number: 1200330  
Course Title: Algebra 2  
Abbreviated Title: ALG 2  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Algebra »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Type: Core  
Course Level: 2  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.912.A.1.6: Identify the real and imaginary parts of complex numbers and perform basic operations.

- MA.912.A.10.3: Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities, rational or radical expressions, or logarithmic or exponential functions).
- MA.912.A.2.5: Graph absolute value equations and inequalities in two variables.
- MA.912.A.2.6: Identify and graph common functions (including but not limited to linear, rational, quadratic, cubic, radical, absolute value).
- MA.912.A.2.7: Perform operations (addition, subtraction, division, and multiplication) of functions algebraically, numerically, and graphically.
- MA.912.A.2.8: Determine the composition of functions.
- MA.912.A.2.10: Describe and graph transformations of functions
- MA.912.A.2.11: Solve problems involving functions and their inverses.
- MA.912.A.2.12: Solve problems using direct, inverse, and joint variations.
- MA.912.A.3.3: Solve literal equations for a specified variable.
- MA.912.A.3.6: Solve and graph the solutions of absolute value equations and inequalities with one variable.
- MA.912.A.3.10: Write an equation of a line given any of the following information: two points on the line, its slope and one point on the line, or its graph. Also, find an equation of a new line parallel to a given line, or perpendicular to a given line, through a given point on the new line.
- MA.912.A.3.14: Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods.
- MA.912.A.3.15: Solve real-world problems involving systems of linear equations and inequalities in two and three variables.
- MA.912.A.4.3: Factor polynomial expressions.
- MA.912.A.4.4: Divide polynomials by monomials and polynomials with various techniques, including synthetic division.
- MA.912.A.4.5: Graph polynomial functions with and without technology and describe end behavior.
- MA.912.A.4.6: Use theorems of polynomial behavior (including but not limited to the Fundamental Theorem of Algebra, Remainder Theorem, the Rational Root Theorem, Descartes' Rule of Signs, and the Conjugate Root Theorem) to find the zeros of a polynomial function.
- MA.912.A.4.7: Write a polynomial equation for a given set of real and/or complex roots.

- MA.912.A.4.8: Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression with and without technology.
- MA.912.A.4.9: Use graphing technology to find approximate solutions for polynomial equations.
- MA.912.A.4.10: Use polynomial equations to solve real-world problems.
- MA.912.A.5.2: Add, subtract, multiply, and divide rational expressions.
- MA.912.A.5.3: Simplify complex fractions.
- MA.912.A.5.5: Solve rational equations.
- MA.912.A.6.2: Add, subtract, multiply, and divide radical expressions (square roots and higher).
- MA.912.A.6.3: Simplify expressions using properties of rational exponents.
- MA.912.A.6.4: Convert between rational exponent and radical forms of expressions.
- MA.912.A.6.5: Solve equations that contain radical expressions.
- MA.912.A.7.3: Solve quadratic equations over the real numbers by completing the square.
- MA.912.A.7.4: Use the discriminant to determine the nature of the roots of a quadratic equation.
- MA.912.A.7.5: Solve quadratic equations over the complex number system.
- MA.912.A.7.6: Identify the axis of symmetry, vertex, domain, range and intercept(s) for a given parabola.
- MA.912.A.8.1: Define exponential and logarithmic functions and determine their relationship
- MA.912.A.8.2: Define and use the properties of logarithms to simplify logarithmic expressions and to find their approximate values.
- MA.912.A.8.3: Graph exponential and logarithmic functions.
- MA.912.A.8.5: Solve logarithmic and exponential equations.
- MA.912.A.8.6: Use the change of base formula.
- MA.912.A.8.7: Solve applications of exponential growth and decay.
- MA.912.D.11.1: Define arithmetic and geometric sequences and series.
- MA.912.D.11.3: Find specified terms of arithmetic and geometric sequences.



Course: 1200320 Algebra 1 Honors

### GENERAL INFORMATION

Course Number: 1200320  
Course Title: Algebra 1 Honors  
Abbreviated Title: ALG 1 HON  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Algebra »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Type: Core  
Course Level: 3  
Course Status: SBE Approval Pending

### RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

### NEXT GENERATION SUNSHINE STATE STANDARDS

MA.912.A.1.8: Use the zero product property of real numbers in a variety of contexts to identify solutions to equations.

- MA.912.A.10.1: Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guessing- and-checking, solving a simpler problem, writing an equation, working backwards, and creating a table.
- MA.912.A.10.2: Decide whether a solution is reasonable in the context of the original situation.
- MA.912.A.10.3: Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities, rational or radical expressions, or logarithmic or exponential functions).
- MA.912.A.2.3: Describe the concept of a function, use function notation, determine whether a given relation is a function, and link equations to functions.
- MA.912.A.2.4: Determine the domain and range of a relation.
- MA.912.A.2.13: Solve real-world problems involving relations and functions.
- MA.912.A.3.1: Solve linear equations in one variable that include simplifying algebraic expressions.
- MA.912.A.3.2: Identify and apply the distributive, associative, and commutative properties of real numbers and the properties of equality.
- MA.912.A.3.3: Solve literal equations for a specified variable.
- MA.912.A.3.4: Solve and graph simple and compound inequalities in one variable and be able to justify each step in a solution.
- MA.912.A.3.5: Symbolically represent and solve multi-step and real-world applications that involve linear equations and inequalities.
- MA.912.A.3.6: Solve and graph the solutions of absolute value equations and inequalities with one variable.
- MA.912.A.3.7: Rewrite equations of a line into slope-intercept form and standard form.
- MA.912.A.3.8: Graph a line given any of the following information: a table of values, the x- and y-intercepts, two points, the slope and a point, the equation of the line in slope-intercept form, standard form, or point-slope form .
- MA.912.A.3.9: Determine the slope, x-intercept, and y-intercept of a line given its graph, its equation, or two points on the line.
- MA.912.A.3.10: Write an equation of a line given any of the following information: two points on the line, its slope and one point on the line, or its graph. Also, find an equation of a new line parallel to a given line, or perpendicular to a given line, through a given point on the new line.

- MA.912.A.3.11: Write an equation of a line that models a data set, and use the equation or the graph to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change.
- MA.912.A.3.12: Graph a linear equation or inequality in two variables with and without graphing technology. Write an equation or inequality represented by a given graph.
- MA.912.A.3.13: Use a graph to approximate the solution of a system of linear equations or inequalities in two variables with and without technology.
- MA.912.A.3.14: Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods.
- MA.912.A.3.15: Solve real-world problems involving systems of linear equations and inequalities in two and three variables.
- MA.912.A.4.1: Simplify monomials and monomial expressions using the laws of integral exponents.
- MA.912.A.4.2: Add, subtract, and multiply polynomials.
- MA.912.A.4.3: Factor polynomial expressions.
- MA.912.A.4.4: Divide polynomials by monomials and polynomials with various techniques, including synthetic division.
- MA.912.A.5.1: Simplify algebraic ratios.
- MA.912.A.5.2: Add, subtract, multiply, and divide rational expressions.
- MA.912.A.5.3: Simplify complex fractions.
- MA.912.A.5.4: Solve algebraic proportions.
- MA.912.A.5.5: Solve rational equations.
- MA.912.A.5.7: Solve real-world problems involving rational equations (mixture, distance, work, interest, and ratio).
- MA.912.A.6.1: Simplify radical expressions
- MA.912.A.6.2: Add, subtract, multiply, and divide radical expressions (square roots and higher).
- MA.912.A.7.1: Graph quadratic equations with and without graphing technology.
- MA.912.A.7.2: Solve quadratic equations over the real numbers by factoring and by using the quadratic formula.
- MA.912.A.7.6: Identify the axis of symmetry, vertex, domain, range and intercept(s) for a given parabola.

- MA.912.A.7.8: Use quadratic equations to solve real-world problems.
- MA.912.A.7.10: Use graphing technology to find approximate solutions of quadratic equations.
- MA.912.D.7.1: Perform set operations such as union and intersection, complement, and cross product.
- MA.912.D.7.2: Use Venn diagrams to explore relationships and patterns and to make arguments about relationships between sets.
- MA.912.G.1.4: Use coordinate geometry to find slopes, parallel lines, perpendicular lines, and equations of lines.

Course: 1200315 Algebra 1 for Credit Recovery

## GENERAL INFORMATION

Course Number: 1200315  
Course Title: Algebra 1 for Credit Recovery  
Abbreviated Title: ALG 1 CR  
Course Path: Section: Grades PreK to 12 Education Courses» Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Algebra »

Number of Credits: One credit (1)  
Course Length: Varies  
Course Level: 2  
Course Status: SBE Approval Pending  
Special Notes: *Credit Recovery courses are credit bearing courses with specific content requirements defined by Next Generation Sunshine State Standards and/or Common Core State Standards. Students enrolled in a Credit Recovery course must have previously attempted the corresponding course (and/or End-of-Course assessment) since the course requirements for the Credit Recovery course are exactly the same as the previously attempted corresponding course. For example, Geometry (1206310) and Geometry for Credit Recovery (1206315) have identical content requirements. It is important to note that Credit Recovery courses are not bound by Section 1003.436(1)(a), Florida Statutes, requiring a minimum of 135 hours of bona fide instruction (120 hours in a school/district implementing block scheduling) in a designed course of study that contains student performance standards, since the students have previously attempted successful completion of the corresponding course. Additionally, Credit Recovery courses should ONLY be used for credit recovery, grade forgiveness, or remediation for students needing to prepare for an End-of-Course assessment retake.*

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3**     **Integration of Knowledge and Ideas**  
LACC.910.RST.3.7     Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3**     **Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7     Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

### **NEXT GENERATION SUNSHINE STATE STANDARDS**

MA.912.A.1.8:         Use the zero product property of real numbers in a variety of contexts to identify solutions to equations.

MA.912.A.10.1:       Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guessing- and-checking, solving a simpler problem, writing an equation, working backwards, and creating a table.

MA.912.A.10.2:       Decide whether a solution is reasonable in the context of the original situation.

MA.912.A.10.3:       Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities, rational or radical expressions, or logarithmic or exponential functions).

MA.912.A.2.3:         Describe the concept of a function, use function notation, determine whether a given relation is a function, and link equations to functions.

MA.912.A.2.4:         Determine the domain and range of a relation.

MA.912.A.2.13:        Solve real-world problems involving relations and functions.

MA.912.A.3.1:         Solve linear equations in one variable that include simplifying algebraic expressions.

MA.912.A.3.2:         Identify and apply the distributive, associative, and commutative properties of real numbers and the properties of equality.

MA.912.A.3.3:         Solve literal equations for a specified variable.

MA.912.A.3.4:         Solve and graph simple and compound inequalities in one variable and be able to justify each step in a solution.

MA.912.A.3.5:         Symbolically represent and solve multi-step and real-world applications that involve linear equations and inequalities.

MA.912.A.3.7:         Rewrite equations of a line into slope-intercept form and standard form.

- MA.912.A.3.8: Graph a line given any of the following information: a table of values, the x- and y-intercepts, two points, the slope and a point, the equation of the line in slope-intercept form, standard form, or point-slope form.
- MA.912.A.3.9: Determine the slope, x-intercept, and y-intercept of a line given its graph, its equation, or two points on the line.
- MA.912.A.3.10: Write an equation of a line given any of the following information: two points on the line, its slope and one point on the line, or its graph. Also, find an equation of a new line parallel to a given line, or perpendicular to a given line, through a given point on the new line.
- MA.912.A.3.11: Write an equation of a line that models a data set, and use the equation or the graph to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change.
- MA.912.A.3.12: Graph a linear equation or inequality in two variables with and without graphing technology. Write an equation or inequality represented by a given graph.
- MA.912.A.3.13: Use a graph to approximate the solution of a system of linear equations or inequalities in two variables with and without technology.
- MA.912.A.3.14: Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods.
- MA.912.A.3.15: Solve real-world problems involving systems of linear equations and inequalities in two and three variables.
- MA.912.A.4.1: Simplify monomials and monomial expressions using the laws of integral exponents.
- MA.912.A.4.2: Add, subtract, and multiply polynomials.
- MA.912.A.4.3: Factor polynomial expressions.
- MA.912.A.4.4: Divide polynomials by monomials and polynomials with various techniques, including synthetic division.
- MA.912.A.5.1: Simplify algebraic ratios.
- MA.912.A.5.4: Solve algebraic proportions.
- MA.912.A.6.1: Simplify radical expressions.
- MA.912.A.6.2: Add, subtract, multiply, and divide radical expressions (square roots and higher).
- MA.912.A.7.1: Graph quadratic equations with and without graphing technology.

- MA.912.A.7.2: Solve quadratic equations over the real numbers by factoring and by using the quadratic formula.
- MA.912.A.7.8: Use quadratic equations to solve real-world problems.
- MA.912.A.7.10: Use graphing technology to find approximate solutions of quadratic equations.
- MA.912.D.7.1: Perform set operations such as union and intersection, complement, and cross product.
- MA.912.D.7.2: Use Venn diagrams to explore relationships and patterns and to make arguments about relationships between sets.
- MA.912.G.1.4: Use coordinate geometry to find slopes, parallel lines, perpendicular lines, and equations of lines.



Course: 1200310 Algebra 1

## GENERAL INFORMATION

Course Number: 1200310  
Course Title: Algebra 1  
Abbreviated Title: ALG 1  
Course Path: Section: Grades PreK to 12 Education Courses» Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Algebra »  
Number of Credits: One credit (1)  
Course Length: One Year  
Course Type: Core  
Course Level: 2  
Course Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

**LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

**LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

**LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

**LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

MA.912.A.1.8: Use the zero product property of real numbers in a variety of contexts to identify solutions to equations.

- MA.912.A.10.1: Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guessing- and-checking, solving a simpler problem, writing an equation, working backwards, and creating a table.
- MA.912.A.10.2: Decide whether a solution is reasonable in the context of the original situation.
- MA.912.A.10.3: Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities, rational or radical expressions, or logarithmic or exponential functions).
- MA.912.A.2.3: Describe the concept of a function, use function notation, determine whether a given relation is a function, and link equations to functions.
- MA.912.A.2.4: Determine the domain and range of a relation.
- MA.912.A.2.13: Solve real-world problems involving relations and functions.
- MA.912.A.3.1: Solve linear equations in one variable that include simplifying algebraic expressions.
- MA.912.A.3.2: Identify and apply the distributive, associative, and commutative properties of real numbers and the properties of equality.
- MA.912.A.3.3: Solve literal equations for a specified variable.
- MA.912.A.3.4: Solve and graph simple and compound inequalities in one variable and be able to justify each step in a solution.
- MA.912.A.3.5: Symbolically represent and solve multi-step and real-world applications that involve linear equations and inequalities.
- MA.912.A.3.7: Rewrite equations of a line into slope-intercept form and standard form.
- MA.912.A.3.8: Graph a line given any of the following information: a table of values, the x- and y-intercepts, two points, the slope and a point, the equation of the line in slope-intercept form, standard form, or point-slope form.
- MA.912.A.3.9: Determine the slope, x-intercept, and y-intercept of a line given its graph, its equation, or two points on the line.
- MA.912.A.3.10: Write an equation of a line given any of the following information: two points on the line, its slope and one point on the line, or its graph. Also, find an equation of a new line parallel to a given line, or perpendicular to a given line, through a given point on the new line.
- MA.912.A.3.11: Write an equation of a line that models a data set, and use the equation or the graph to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change.

- MA.912.A.3.12: Graph a linear equation or inequality in two variables with and without graphing technology. Write an equation or inequality represented by a given graph.
- MA.912.A.3.13: Use a graph to approximate the solution of a system of linear equations or inequalities in two variables with and without technology.
- MA.912.A.3.14: Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods.
- MA.912.A.3.15: Solve real-world problems involving systems of linear equations and inequalities in two and three variables.
- MA.912.A.4.1: Simplify monomials and monomial expressions using the laws of integral exponents.
- MA.912.A.4.2: Add, subtract, and multiply polynomials.
- MA.912.A.4.3: Factor polynomial expressions.
- MA.912.A.4.4: Divide polynomials by monomials and polynomials with various techniques, including synthetic division.
- MA.912.A.5.1: Simplify algebraic ratios.
- MA.912.A.5.4: Solve algebraic proportions.
- MA.912.A.6.1: Simplify radical expressions.
- MA.912.A.6.2: Add, subtract, multiply, and divide radical expressions (square roots and higher).
- MA.912.A.7.1: Graph quadratic equations with and without graphing technology.
- MA.912.A.7.2: Solve quadratic equations over the real numbers by factoring and by using the quadratic formula.
- MA.912.A.7.8: Use quadratic equations to solve real-world problems.
- MA.912.A.7.10: Use graphing technology to find approximate solutions of quadratic equations.
- MA.912.D.7.1: Perform set operations such as union and intersection, complement, and cross product.
- MA.912.D.7.2: Use Venn diagrams to explore relationships and patterns and to make arguments about relationships between sets.
- MA.912.G.1.4: Use coordinate geometry to find slopes, parallel lines, perpendicular lines, and equations of lines.

Course: 1200300 Basic Mathematics Skills

## GENERAL INFORMATION

Course Number: 1200300  
Course Title: Basic Mathematics Skills  
Abbreviated Title: BASIC MATH SKLS  
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics » SubSubject: Algebra »  
Number of Credits: One credit (1)  
Course Length: Year  
Course Level: 1  
Status: SBE Approval Pending

## RELATED STANDARDS/BENCHMARKS

- LACC.910.RST.2 Craft and Structure**  
LACC.910.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
- LACC.1112.RST.2 Craft and Structure**  
LACC.1112.RST.2.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.
- LACC.910.RST.3 Integration of Knowledge and Ideas**  
LACC.910.RST.3.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
- LACC.1112.RST.3 Integration of Knowledge and Ideas**  
LACC.1112.RST.3.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

## NEXT GENERATION SUNSHINE STATE STANDARDS

- MA.6.S.6.1: Determine the measures of central tendency (mean, median, mode) and variability (range) for a given set of data.

- MA.7.A.1.1: Distinguish between situations that are proportional or not proportional, and use proportions to solve problems.
- MA.8.A.1.1: Create and interpret tables, graphs, and models to represent, analyze, and solve problems related to linear equations, including analysis of domain, range, and the difference between discrete and continuous data.
- MA.8.A.1.2: Interpret the slope and the x- and y-intercepts when graphing a linear equation for a real-world problem.
- MA.8.A.1.5: Translate among verbal, tabular, graphical, and algebraic representations of linear functions.
- MA.8.A.4.1: Solve literal equations for a specified variable.
- MA.8.A.6.1: Use exponents and scientific notation to write large and small numbers and vice versa and to solve problems.
- MA.8.A.6.4: Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, and irrational numbers) using multi-step and real world problems.
- MA.8.G.2.1: Use similar triangles to solve problems that include height and distances.
- MA.8.G.2.2: Classify and determine the measure of angles, including angles created when parallel lines are cut by transversals.
- MA.8.G.2.3: Demonstrate that the sum of the angles in a triangle is 180-degrees and apply this fact to find unknown measure of angles and the sum of angles in polygons.
- MA.8.G.2.4: Validate and apply Pythagorean Theorem to find distances in real world situations or between points in the coordinate plane.
- MA.8.G.5.1: Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)) and dimensions including temperature, area, volume, and derived units to solve problems.
- MA.8.S.3.1: Select, organize and construct appropriate data displays, including box and whisker plots, scatter plots, and lines of best fit to convey information and make conjectures about possible relationships.
- MA.912.A.1.1: Know equivalent forms of real numbers (including integer exponents and radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers).
- MA.912.A.1.2: Compare real number expressions.
- MA.912.A.1.3: Simplify real number expressions using the laws of exponents.

- MA.912.A.1.4: Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers) using multi-step and real-world problems.
- MA.912.A.1.5: Use dimensional (unit) analysis to perform conversions between units of measure, including rates.
- MA.912.A.10.2: Decide whether a solution is reasonable in the context of the original situation.
- MA.912.A.10.4: Use counterexamples to show that statements are false.
- MA.912.A.2.1: Create a graph to represent a real-world situation.
- MA.912.A.2.2: Interpret a graph representing a real-world situation.
- MA.912.A.3.1: Solve linear equations in one variable that include simplifying algebraic expressions.
- MA.912.A.3.2: Identify and apply the distributive, associative, and commutative properties of real numbers and the properties of equality.
- MA.912.A.4.1: Simplify monomials and monomial expressions using the laws of integral exponents.
- MA.912.P.1.1: Use counting principles, including the addition and the multiplication principles, to determine size of finite sample spaces and probabilities of events in those spaces.
- MA.912.P.2.2: Determine probabilities of independent events.
- MA.912.S.2.2: Apply the definition of random sample and basic types of sampling, including representative samples, stratified samples, censuses.