

Course Number: 1200410	
Course Path: Section: Grades PreK to 12 Education Courses » Grade Group: Grades 9 to 12 and Adult Education Courses » Subject: Mathematics» SubSubject: Algebra »	
Course Title: Mathematics for College Success	
Course Section: Grades PreK to 12 Education Courses	
Abbreviated Title: Math Coll. Success	
Number of Credits: .5	
Course Length: Semester	
Course Type: Elective	
Course Level: 2	
Course Status: DRAFT - State Board approval pending	
Graduation Requirements:	
Course Description: This course is targeted for grade 12 students, whose test scores on the Postsecondary Educational Readiness Test 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: Ratios and Proportional Relationships, Number and Quantities, Algebra, Functions, Expressions and Equations, Geometry, Statistics, Real Number Systems, and the Common Core Standards for High School Modeling. The benchmarks reflect the Florida College Competencies necessary for entry-level college courses.	
<u>RELATED BENCHMARKS:</u>	
Scheme	Descriptor
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.7.EE	Expressions and Equations
MACC.7.EE.1	Use properties of operations to generate equivalent expressions.
MACC.7.EE.1.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
MACC.7.EE.1.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. <i>For example, $a + 0.05a = 1.05a$ means that “increase by 5%” is the same as “multiply by 1.05.”</i>

MACC.7.EE.2	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. <i>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.</i>
MACC.7.EE.2.4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
MACC.7.EE.2.4a	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. <i>For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?</i>
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. <i>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.</i>
MACC.7.G	Geometry
MACC.7.G.1	Draw, construct, and describe geometrical figures and describe the relationships between them.
MACC.7.G.1.6	Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
MACC.7.RP	Ratios and Proportional Relationships
MACC.7.RP.1	Analyze proportional relationships and use them to solve real-world and mathematical problems.
MACC.7.RP.1.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. <i>For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction $(1/2)/(1/4)$ miles per hour, equivalently 2 miles per hour.</i>

MACC.7.RP.1.2	Recognize and represent proportional relationships between quantities.
MACC.7.RP.1.2a	Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
MACC.7.RP.1.2b	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
MACC.7.RP.1.2c	Represent proportional relationships by equations. <i>For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as $t = pn$.</i>
MACC.7.RP.1.2d	Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate.
MACC.7.RP.1.3	Use proportional relationships to solve multistep ratio and percent problems. <i>Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</i>
MACC.8.EE	Expressions and Equations
MACC.8.EE.1	Work with radicals and integer exponents.
MACC.8.EE.1.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions. <i>For example, $3^2 \times 3^{-5} = 3^{-3} = 1/(3^3) = 1/27$.</i>
MACC.8.EE.1.2	Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
MACC.8.EE.1.3	Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. <i>For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9, and determine that the world population is more than 20 times larger.</i>
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. <i>For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.</i>
MACC.8.EE.2.6	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b .
MACC.8.EE.3	Analyze and solve linear equations and pairs of simultaneous linear equations.
MACC.8.EE.3.7	Solve linear equations in one variable.
MACC.8.EE.3.7a	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).
MACC.8.EE.3.7b	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
MACC.8.F	Functions
MACC.8.F.1	Define, evaluate, and compare functions.
MACC.8.F.1.1	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
MACC.8.F.1.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). <i>For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.</i>
MACC.8.F.1.3	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. <i>For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points $(1,1)$, $(2,4)$ and $(3,9)$, which are not on a straight line.</i>
MACC.8.G	Geometry
MACC.8.G.2	Understand and apply the Pythagorean Theorem
MACC.8.G.2.6	Explain a proof of the Pythagorean Theorem and its converse.
MACC.8.G.2.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
MACC.8.G.2.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

MACC.912.A-APR	Arithmetic with Polynomials and Rational Expressions
MACC.912.A-APR.1	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.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. <i>Include equations arising from linear and quadratic functions, and simple rational and exponential functions.*</i>
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. <i>For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*</i>
MACC.912.A-CED.1.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. <i>For example, rearrange Ohm's law $V = IR$ to highlight resistance R.*</i>
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.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-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. <i>For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.</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 $(x^2 - y^2)(x^2 + y^2)$.
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.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-LE	Linear, Quadratic, and Exponential Models*
MACC.912.F-LE.1	Construct and compare linear, quadratic, and exponential models and solve problems*
MACC.912.F-LE.1.1b	Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.*
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-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. <i>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.</i>

MACC.912.N-RN.1.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.
MACC.912.N-RN.1.3	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.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.*
MACC.912.S-ID.3.8	Compute (using technology) and interpret the correlation coefficient of a linear fit.*

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 (*).*