Course Number: 1200700	
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 Readiness	
Course Section: Grades PreK to 12 Education Courses	
Abbreviated Title: Math Coll. Readiness	
Number of Credits: 1	
Course Length: Year	
Course Type: Core	
Course Level: 2	
Course Status: DRAFT - State Board approval pending	
Graduation Requirements:	
Course Description: This course incorporates the Common Core Standards for Mathematical Practices as well as the following Common Core Standards for Mathematical Content: an introduction to functions, linear equations and inequalities, solving systems of equations, rational equations and algebraic fractions, radicals and rational exponents, factoring and quadratic equations, complex numbers, and the Common Core Standards for High School Modeling. The benchmarks reflect the Florida College Competencies necessary for entry-level college courses.	
RELATED BENCHMARKS:	
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.2	**Solve real-life and mathematical problems using numerical and algebraic expressions and equations**
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. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*
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.8.EE	**Expressions and Equations**
MACC.8.EE.1	**Work with radicals and integer exponents**
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 √2 is irrational.
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.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.EE.3.8	Analyze and solve linear equations and pairs of simultaneous linear equations.

MACC.8.EE.3.8a	Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
MACC.8.EE.3.8b	Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.*
MACC.8.EE.3.8c	Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair*.
MACC.8.F	**Functions**
MACC.8.F.1	**Define, evaluate, and compare functions**
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). *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.*
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. *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.*
MACC.8.F.2	**Use functions to model relationships between quantities**
MACC.8.F.2.4	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.F.2.5	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.
MACC.8.NS	**The Number System**
MACC.8.NS.1	**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., π^2). *For example, by truncating the decimal expansion of √2 (square root of 2), show that √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	**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. 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-REI.4.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
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.A-SSE.2.3b	Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.*
MACC.912.A-SSE.2.3c	Use the properties of exponents to transform expressions for exponential functions. *For example the expression 1.15^t can be rewritten as $[1.15^{1/12}]^{12t} \approx 1.012^{12t}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.**
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.1.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
MACC.912.F-IF.2	**Interpret functions that arise in applications in terms of the context**
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.3.7	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.3.7b	Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.*
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-IF.3.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum*
MACC.912.F-IF-3	**Analyze functions using different representations**
MACC.912.N-CN	**The Complex Number System**
MACC.912.N-CN.1	**Perform arithmetic operations with complex numbers**
MACC.912.N-CN.1.1	Know there is a complex number *i* such that $i^2 = -1$, and every complex number has the form $a + bi$ with *a* and *b* real.
MACC.912.N-CN.1.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
MACC.912.N-CN.1.3	Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers.
MACC.912.N-CN.3	**Use complex numbers in polynomial identities and equations**
MACC.912.N-CN.3.7	Solve quadratic equations with real coefficients that have complex solutions.
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.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 (*).*