**LSU College Readiness Program for Math**

**COURSE PROFILE**

**2-17-2017**

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| **COURSE NAME** | **LSU Math 1021 College Algebra** |
| **COMMON COURSE NUMBER** | **CMAT 1213 College Algebra** |
| **PRIMARY ONLINE CONTENT SOURCE** | ***Algebra and Trigonometry, 2e,* *MyMathLab***  Kirk Trigsted |
| **COURSE/UNIT CREDIT** | **3 credit hours, 1 Carnegie Unit** |
| **GRADE(S)** | **10, 11, or 12** |
| **PREREQUISITE(S)** | **MACT min 19 and Composite min 18** |

**CHAPTERS**

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| **1 - Equations, Inequalities, and Applications** | **4 - Polynomial and Rational Functions** |
| **2 - The Rectangular Coordinate System, Lines, and Circles** | **5 - Exponential and Logarithmic Functions and Equations** |
| **3 - Functions** | **12 - Systems of Equations** |

**SECTION NAMES (NUMBER OF EXERCISES) AND LEARNING OBJECTIVES**

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| **CHAPTER 1: Equations, Inequalities, and Applications** |
| **1.1 Linear Equations (44)**  Find the least common denominator of an expression  Recognize linear equations  Solve linear equations with integer coefficients  Solve linear equations involving fractions  Solve linear equations involving decimals  Solve equations that lead to linear equations |
| **1.4 Quadratic Equations (39)**  Simplify radical expressions  Factor trinomials  Solve quadratic equations by factoring  Solve quadratic equations using the square root property  Solve quadratic equations using the quadratic formula  Use the discriminant to determine the type of solutions of a quadratic equation |
| **1.6 Other Types of Equations (35)**  Simplify expressions  Solve higher-order polynomial equations  Solve equations that are quadratic in form  Solve equations involving single radicals |
| **1.7 Linear Inequalities (19)**  Solve linear inequalities  Solve three-part inequalities |

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| **1.8 Absolute Value Equations and Inequalities (29)**  Solve an absolute value equation  Solve an absolute value “less than” inequality  Solve an absolute value “greater than” inequality |
| **CHAPTER 2: The Rectangular Coordinate System, Lines, and Circles** |
| **2.1 The Rectangular Coordinate System (25)**  Find the average of two numbers  Simplify radicals  Plot ordered pairs  Find the midpoint of a line segment using the midpoint formula  Find the distance between two points using the distance formula |
| **2.2 Circles (34)**  Complete the square to form perfect square trinomials  Write the standard form of an equation of a circle  Sketch the graph of a circle given its equation in general form  Find the center and radius of a circle given its equation in general form |
| **2.3 Lines (56)**  Solve a linear equation for the variable *y*  Determine the slope of a line through two given points  Sketch a line given a point and the slope  Find the equation of a line using the point-slope form  Find the equation of a line using the slope-intercept form  Write the equation of a line in standard form  Find the slope and the y-intercept of a line in standard form  Sketch lines by plotting intercepts  Sketch a line given its equation in standard form  Find the equation of a horizontal line and a vertical line |
| **2.4 Parallel and Perpendicular Lines (38)**  Determine whether two lines are parallel, perpendicular, or neither  Find the equations of parallel and perpendicular lines |
| **CHAPTER 3: Functions** |
| **3.1 Relations and Functions (62)**  Simplify algebraic expressions  Understand the definitions of relations and functions  Determine whether equations represent functions  Use function notation and evaluate functions  Use the vertical line test  Determine the domain of a function given the equation |
| **3.2 Properties of a Function’s Graph (49)**  Evaluate *f(-x)* given a function *f(x)*  Determine the intercepts of a function  Determine the domain and range of a function from its graph  Determine whether a function is increasing, decreasing, or constant  Determine relative maximum and relative minimum values of a function  Determine whether a function if even, odd, or neither  Determine information about a function from a graph |
| **3.3 Graphs of Basic Functions; Piecewise Functions (28)**  Sketch the graphs of the basic functions  Analyze piecewise-defined functions |
| **3.4 Transformations of Functions (50)**  Use vertical shifts to graph functions  Use horizontal shifts to graph functions  Use vertical stretches and compressions to graph functions  Use combinations of transformations to graph functions |
| **3.5 Composite Functions (21)**  Simplify fractional expressions  Form and evaluate composite functions  Determine the domain of composite functions |
| **3.6 One-to-One Functions; Inverse Functions (44)**  Understand the definition of a one-to-one function  Determine whether a function is one-to-one using the horizontal line test  Understand and verify inverse functions  Sketch the graphs of inverse functions  Find the inverse of a one-to-one function |
| **CHAPTER 4: Polynomial and Rational Functions** |
| **4.1 Quadratic Functions (38)**  Determine whether the graph of a quadratic function opens up or down  Determine properties of quadratic function in standard form and graph  Determine properties of quadratic function using the vertex formula and graph  Determine the equation of a quadratic function given its graph |
| **4.2 Applications of Quadratic Functions (10)**  Find the maximum value for projectile motion functions  Find the maximum value for functions in economics |
| **4.3 Graphs of Polynomial Functions (46)**  Identify polynomial functions, degree, constant and leading coefficients  Sketch the graphs of power functions  Determine the end behavior of polynomial functions  Determine the intercepts of a polynomial function  Determine the real zeros of polynomial functions and their multiplicities  Sketch the graph of a polynomial function  Determine a possible equation of a polynomial function given its graph |
| **4.6 Rational Functions and Their Graphs (40)**  Find the domain and intercepts of rational functions  Identify vertical asymptotes  Identify horizontal asymptotes  Use transformations to sketch the graphs of rational functions  Sketch the graph of rational functions containing removable discontinutes  Sketch rational functions |
| **CHAPTER 5: Exponential and Logarithmic Functions and Equations** |
| **5.1 Exponential Functions (65)**  Rewrite expressions in exponential form  Evaluate exponential expressions  Sketch the graphs of exponential functions  Determine possible equations of exponential functions given their graphs  Sketch the graphs of exponential functions using transformations  Solve exponential equations by relating the bases |

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| **5.2 Logarithmic Functions (62)**  Change equations between exponential form and logarithmic form  Evaluate logarithmic expressions  Use properties of logarithms to evaluate expressions  Use common and natural logarithms  Sketch the graphs of logarithmic functions  Find the domain of logarithmic functions |
| **5.3 Properties of Logarithms (44)**  Expand and evaluate logarithmic expressions  Condense and evaluate logarithmic expressions  Solve logarithmic equations using the logarithm property of equality  Use the change of base formula |
| **5.4 Exponential and Logarithmic Equations (43)**  Evaluate exponential and logarithmic expressions using a calculator  Solve exponential equations  Solve logarithmic equations |
| **5.5 Applications of Exponential and Logarithmic Functions (16)**  Solve applications involving exponential functions  Solve compound interest applications  Solve exponential growth and decay applications |
| **CHAPTER 12: Systems of Equations** |
| **12.1 Systems of Linear Equations in Two Variables (13)**  Verify solutions to a system of linear equations in two variables  Solve a system of linear equations using the substitution method  Solve a system of linear equations using the elimination method  Solve systems of linear equations in two variables using either method  Solve applied problems using a system of linear equation |