**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 expressionRecognize linear equationsSolve linear equations with integer coefficientsSolve linear equations involving fractionsSolve linear equations involving decimalsSolve equations that lead to linear equations |
| **1.4 Quadratic Equations (39)**Simplify radical expressionsFactor trinomialsSolve quadratic equations by factoringSolve quadratic equations using the square root propertySolve quadratic equations using the quadratic formulaUse the discriminant to determine the type of solutions of a quadratic equation |
| **1.6 Other Types of Equations (35)**Simplify expressionsSolve higher-order polynomial equationsSolve equations that are quadratic in formSolve equations involving single radicals |
| **1.7 Linear Inequalities (19)**Solve linear inequalitiesSolve three-part inequalities |

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| **1.8 Absolute Value Equations and Inequalities (29)**Solve an absolute value equationSolve an absolute value “less than” inequalitySolve 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 numbersSimplify radicalsPlot ordered pairsFind the midpoint of a line segment using the midpoint formulaFind the distance between two points using the distance formula |
| **2.2 Circles (34)**Complete the square to form perfect square trinomialsWrite the standard form of an equation of a circleSketch the graph of a circle given its equation in general formFind 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 slopeFind the equation of a line using the point-slope formFind the equation of a line using the slope-intercept formWrite the equation of a line in standard formFind the slope and the y-intercept of a line in standard formSketch lines by plotting interceptsSketch a line given its equation in standard formFind 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 neitherFind the equations of parallel and perpendicular lines |
| **CHAPTER 3: Functions** |
| **3.1 Relations and Functions (62)**Simplify algebraic expressionsUnderstand the definitions of relations and functionsDetermine whether equations represent functionsUse function notation and evaluate functionsUse the vertical line testDetermine 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 functionDetermine the domain and range of a function from its graphDetermine whether a function is increasing, decreasing, or constantDetermine relative maximum and relative minimum values of a functionDetermine whether a function if even, odd, or neitherDetermine information about a function from a graph |
| **3.3 Graphs of Basic Functions; Piecewise Functions (28)**Sketch the graphs of the basic functionsAnalyze piecewise-defined functions |
| **3.4 Transformations of Functions (50)**Use vertical shifts to graph functionsUse horizontal shifts to graph functionsUse vertical stretches and compressions to graph functionsUse combinations of transformations to graph functions |
| **3.5 Composite Functions (21)**Simplify fractional expressionsForm and evaluate composite functionsDetermine the domain of composite functions |
| **3.6 One-to-One Functions; Inverse Functions (44)**Understand the definition of a one-to-one functionDetermine whether a function is one-to-one using the horizontal line testUnderstand and verify inverse functionsSketch the graphs of inverse functionsFind 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 downDetermine properties of quadratic function in standard form and graphDetermine 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 functionsFind the maximum value for functions in economics |
| **4.3 Graphs of Polynomial Functions (46)**Identify polynomial functions, degree, constant and leading coefficientsSketch the graphs of power functionsDetermine the end behavior of polynomial functionsDetermine the intercepts of a polynomial functionDetermine the real zeros of polynomial functions and their multiplicitiesSketch the graph of a polynomial functionDetermine 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 functionsIdentify vertical asymptotesIdentify horizontal asymptotesUse transformations to sketch the graphs of rational functionsSketch the graph of rational functions containing removable discontinutesSketch rational functions |
| **CHAPTER 5: Exponential and Logarithmic Functions and Equations** |
| **5.1 Exponential Functions (65)**Rewrite expressions in exponential formEvaluate exponential expressionsSketch the graphs of exponential functionsDetermine possible equations of exponential functions given their graphsSketch the graphs of exponential functions using transformationsSolve exponential equations by relating the bases |

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| **5.2 Logarithmic Functions (62)**Change equations between exponential form and logarithmic formEvaluate logarithmic expressionsUse properties of logarithms to evaluate expressionsUse common and natural logarithmsSketch the graphs of logarithmic functionsFind the domain of logarithmic functions |
| **5.3 Properties of Logarithms (44)**Expand and evaluate logarithmic expressionsCondense and evaluate logarithmic expressionsSolve logarithmic equations using the logarithm property of equalityUse the change of base formula |
| **5.4 Exponential and Logarithmic Equations (43)**Evaluate exponential and logarithmic expressions using a calculatorSolve exponential equationsSolve logarithmic equations |
| **5.5 Applications of Exponential and Logarithmic Functions (16)**Solve applications involving exponential functionsSolve compound interest applicationsSolve 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 variablesSolve a system of linear equations using the substitution methodSolve a system of linear equations using the elimination methodSolve systems of linear equations in two variables using either methodSolve applied problems using a system of linear equation |