LSU Dual Enrollment Program for Math

 COURSE PROFILE

Content Revised 4-17-2018

**COURSE NAME: Math 1021 College Algebra**

**HIGH SCHOOL COURSE CODE: 160500**

**BOARD OF REGENTS COMMON COURSE NUMBER: CMAT 1213 College Algebra**

**PRIMARY ONLINE CONTENT SOURCE: *Algebra & Trigonometry, 3e,* *MyMathLab*, Kirk Trigsted**

**COURSE/UNIT CREDIT: 3 credit hours, 1 Carnegie Unit**

**GRADE(S): 10, 11, or 12**

**CHAPTERS**

**1 – Equations, Inequalities, and Applications**

**2 – The Rectangular Coordinate System, Lines, and Circles**

**3 – Functions**

**4 – Polynomial and Rational Functions**

**5 – Exponential and Logarithmic Functions and Equations**

**12 – Systems of Equations**

| **SECTION NAMES (NUMBER OF EXERCISES) AND LEARNING OBJECTIVES** |
| --- |
| **CHAPTER 1: Equations, Inequalities, and Applications**  |
| **1.1 Linear and Rational Equations (51)**Recognize linear equationsSolve linear equations with integer coefficientsSolve linear equations involving fractionsSolve linear equations involving decimalsRecognize rational equationsSolve rational equations that lead to linear equations |
| **1.4 Quadratic Equations (44)**Solve 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 (40)**Solve higher-order polynomial equationsSolve equations that are quadratic in formSolve equations involving single radicals |
| **1.7 Linear Inequalities (26)**Solve linear inequalities in one variableSolve three-part inequalities in one variable |
| **1.8 Absolute Value Equations and Inequalities (35)**Solve absolute value equationsSolve absolute value “less than” inequalitiesSolve absolute value “greater than” inequalities |
| **CHAPTER 2: The Rectangular Coordinate System, Lines, and Circles** |
| **2.1 The Rectangular Coordinate System (28)** Plot ordered pairsFind intercepts of graphs from equationsFind the midpoint of a line segment using the midpoint formulaFind the distance between two points using the distance formula |
| **2.2 Circles (36)**Write the standard form of an equation of a circleFind the center, radius, intercepts, and sketch the graph of circles given equations in standard formFind the center, radius, intercepts, and sketch the graph of circles given equations in general form |
| **2.3 Lines (55)**Determine the slopes of lines through two given points Sketch lines 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 formFind the equation of a horizontal line and a vertical lineWrite 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 form |
| **2.4 Parallel and Perpendicular Lines (38)**Determine whether two lines are parallel, perpendicular, or neitherFind the equations of lines parallel to given linesFind the equations of lines perpendicular to given lines |
| **CHAPTER 3: Functions** |
| **3.1 Relations and Functions (62)**Find the domain and range of relations, and determine if relations represent functionsDetermine whether equations represent functionsUse function notation and evaluate functions at given valuesDetermine difference quotientsUse the vertical line test to determine if graphs represent functionsClassify functions as polynomials, rational functions, or root functions, and find their domains |
| **3.2 Properties of a Function’s Graph (47)**Determine the intercepts of a functionDetermine the domain and range of a function from its graphDetermine where functions are increasing, decreasing, or constantDetermine relative maximum and relative minimum values of a functionDetermine whether a function if even, odd, or neitherIdentify function properties from graphs |
| **3.3 Graphs of Basic Functions; Piecewise Functions (38)**Sketch the graphs of the basic functionsSketch graphs of basic functions with restricted domainsDetermine functions and their domains from graphs of piecewise-defined functionsGraph and determine properties of piecewise-defined functions |
| **3.4 Transformations of Functions (51)**Use vertical shifts to graph functionsUse horizontal shifts to graph functionsUse vertical stretches and compressions to graph functionsUse combinations of transformations to graph functionsUse transformations to sketch the graphs of piecewise-defined functions |
| **3.5 Composite Functions (19)**Find composite functionsEvaluate composite functions at a given point |
| **3.6 One-to-One Functions; Inverse Functions (44)**Determine if functions are one-to-oneDetermine whether a function is one-to-one using the horizontal line testVerify functions are inverses of one anotherFind inverses of one-to-one functionsSketch the graphs of inverse functionsUse the graphs of functions to determine properties about its inverse |
| **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 vertex form and graph the functionDetermine properties of quadratic function using the vertex formula and graph the functionDetermine the equation of a quadratic function given its graph |
| **4.2 Applications of Quadratic Functions (10)**Solve applications involving the maximum of projectile motion functionsSolve applications involving the maximum of functions in economics |
| **4.3 Graphs of Polynomial Functions (46)**Identify polynomial functions and their degree, leading coefficient, and constant coefficientSketch the graphs of power functions using transformationsUse the end behavior of polynomial functions to describe the equation of the functionDetermine the intercepts of a polynomial functionDetermine the real zeros of polynomial functions and their multiplicitiesSketch the graph of a polynomial function using the four-step processDetermine a possible equation of a polynomial function given its graph |
| **4.6 Rational Functions and Their Graphs (41)**Find the domain and intercepts of rational functionsIdentify vertical asymptotesIdentify horizontal asymptotesUse transformations to sketch the graphs of rational functionsFind removable discontinuities, intercepts, and asymptotes and sketch graphs of rational functions |
| **CHAPTER 5: Exponential and Logarithmic Functions and Equations** |
| **5.1 Exponential Functions (65)**Evaluate 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 basesSolve applications involving exponential functions |
| **5.2 Logarithmic Functions (61)**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 expressions using properties of logarithmsCondense and evaluate logarithmic expressions using properties of logarithmsSolve logarithmic equations using the logarithm property of equalityUse the change of base formula to approximate logarithmic expressions |
| **5.4 Exponential and Logarithmic Equations (43)**Solve exponential equationsSolve logarithmic equations |
| **5.5 Applications of Exponential and Logarithmic Functions (16)**Solve applications involving compound interestSolve 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 systems of linear equations using the substitution methodSolve systems 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 |