LSU College Readiness Dual Enrollment Program for Math

 COURSE PROFILE

6-10-24

**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 with Interactive Assessments, 4e,* *MyLab Math*, Kirk Trigsted**

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

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

**PREREQUISITE(S): MACT min 19**

**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** |
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| **CHAPTER 1: Equations, Inequalities, and Applications**  |
| **1.1 Linear and Rational Equations (67)**Determine whether equations are linear or nonlinearSolve linear equations with integer coefficientsSolve linear equations involving fractionsSolve linear equations involving decimalsIdentify rational equationsSolve rational equations that lead to linear equations |
| **1.4 Quadratic Equations (62)**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 (58)**Solve higher-order polynomial equationsSolve equations that are quadratic in formSolve equations involving single radicals |
| **1.7 Linear Inequalities (39)**Solve linear inequalities in one variableSolve three-part inequalities in one variable |
| **1.8 Absolute Value Equations and Inequalities (16)**Solve absolute value equations |
| **CHAPTER 2: The Rectangular Coordinate System, Lines, and Circles** |
| **2.1 The Rectangular Coordinate System (29)** Plot ordered pairsDetermine if an ordered pair lies on a graphFind 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 (42)**Write the standard form of an equation of a circleFind the center, radius, and intercepts and sketch the graph of circles given equations in standard formFind the center, radius, and intercepts and sketch the graph of circles given equations in general form |
| **2.3 Lines (60)**Find the slopes of lines that pass through two given points Sketch the graph of a line given a point and the slopeFind the equation of a line in point-slope formFind the equation of a line in slope-intercept formFind the equation of a line in standard formFind the slope and the y-intercept of a line in standard form and sketch the graphSketch the graphs of lines given in standard form by plotting interceptsFind equations of horizontal lines and vertical lines |
| **2.4 Parallel and Perpendicular Lines (39)**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 (65)**Find the domain and range of relations, and determine if relations represent functionsDetermine whether equations represent functionsUse function notation to identify points that lie on graphs of functionsEvaluate 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 (54)**Determine the intercepts of a functionDetermine the domain and range of functions from their graphsDetermine where functions are increasing, decreasing, or constantDetermine relative maximum and relative minimum values of a functionDetermine whether a function is even, odd, or neitherUse graphs to evaluate or compare functionsIdentify function properties from graphs |
| **3.3 Graphs of Basic Functions; Piecewise Functions (41)**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 (54)**Use vertical shifts to graph functionsUse horizontal shifts to graph functionsUse reflections 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 (23)**Find composite functionsEvaluate composite functions at a given point |
| **3.6 One-to-One Functions; Inverse Functions (46)**Determine if functions are one-to-oneDetermine whether a function is one-to-one using the horizontal line testDetermine if functions are inverses of one anotherFind inverses of one-to-one functionsSketch the graphs of inverse functionsUse the graph of a function to determine properties of its inverse |
| **CHAPTER 4: Polynomial and Rational Functions** |
| **4.1 Quadratic Functions (39)**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 (14)**Solve applications involving the maximum of projectile motion functionsSolve applications involving the maximum of functions in economics |
| **4.3 Graphs of Polynomial Functions (47)**Identify polynomial functions and their degree, leading coefficient, and constant termSketch 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 (40)**Find the domain and intercepts of rational functionsIdentify vertical asymptotes of rational functionsIdentify horizontal asymptotes of rational functionsUse 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 (62)**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 (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 (40)**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 expressionsUse the change of base formula to solve logarithmic equations |
| **5.4 Exponential and Logarithmic Equations (48)**Solve exponential equationsSolve logarithmic equations |
| **5.5 Applications of Exponential and Logarithmic Functions (19)**Solve applications involving compound interestSolve exponential growth and decay applications |
| **CHAPTER 12: Systems of Equations** |
| **12.1 Systems of Linear Equations in Two Variables (20)**Determine whether ordered pairs are solutions to systems 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 applications using a system of linear equations |