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
CHAPTER 1: Equations, Inequalities, and Applications
1.1 Linear and Rational Equations (67) Determine whether equations are linear or nonlinear Solve linear equations with integer coefficients Solve linear equations involving fractions Solve linear equations involving decimals Identify rational equations Solve rational equations that lead to linear equations
1.4 Quadratic Equations (62) 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 (58) Solve higher-order polynomial equations Solve equations that are quadratic in form Solve equations involving single radicals
1.7 Linear Inequalities (39) Solve linear inequalities in one variable Solve three-part inequalities in one variable

SECTION NAMES (NUMBER OF EXERCISES) AND LEARNING OBJECTIVES
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 pairs
Determine if an ordered pair lies on a graph
Find intercepts of graphs from equations
Find the midpoint of a line segment using the midpoint formula
Find the distance between two points using the distance formula
2.2 Circles (42)
Write the standard form of an equation of a circle
Find the center, radius, and intercepts and sketch the graph of circles given equations in standard form
Find 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 slope
Find the equation of a line in point-slope form
Find the equation of a line in slope-intercept form
Find the equation of a line in standard form
Find the slope and the y-intercept of a line in standard form and sketch the graph
Sketch the graphs of lines given in standard form by plotting intercepts
Find equations of horizontal lines and vertical lines
2.4 Parallel and Perpendicular Lines (39)
Determine whether two lines are parallel, perpendicular, or neither
Find the equations of lines parallel to given lines
Find 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 functions
Determine whether equations represent functions
Use function notation to identify points that lie on graphs of functions
Evaluate functions at given values
Determine difference quotients
Use the vertical line test to determine if graphs represent functions
Classify 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 function
Determine the domain and range of functions from their graphs
Determine where functions are increasing, decreasing, or constant
Determine relative maximum and relative minimum values of a function
Determine whether a function is even, odd, or neither
Use graphs to evaluate or compare functions
Identify function properties from graphs

SECTION NAMES (NUMBER OF EXERCISES) AND LEARNING OBJECTIVES
3.3 Graphs of Basic Functions; Piecewise Functions (41)
Sketch the graphs of the basic functions
Sketch graphs of basic functions with restricted domains
Determine functions and their domains from graphs of piecewise-defined functions
Graph and determine properties of piecewise-defined functions
3.4 Transformations of Functions (54)
Use vertical shifts to graph functions
Use horizontal shifts to graph functions
Use reflections to graph functions
Use vertical stretches and compressions to graph functions
Use combinations of transformations to graph functions
Use transformations to sketch the graphs of piecewise-defined functions
3.5 Composite Functions (23)
Find composite functions
Evaluate composite functions at a given point
3.6 One-to-One Functions; Inverse Functions (46)
Determine if functions are one-to-one
Determine whether a function is one-to-one using the horizontal line test
Determine if functions are inverses of one another
Find inverses of one-to-one functions
Sketch the graphs of inverse functions
Use 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 down
Determine properties of quadratic function in vertex form and graph the function
Determine properties of quadratic function using the vertex formula and graph the function
Determine the equation of a quadratic function given its graph
4.2 Applications of Quadratic Functions (14)
Solve applications involving the maximum of projectile motion functions
Solve 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 term
Sketch the graphs of power functions using transformations
Use the end behavior of polynomial functions to describe the equation of the function
Determine the intercepts of a polynomial function
Determine the real zeros of polynomial functions and their multiplicities
Sketch the graph of a polynomial function using the four-step process
Determine a possible equation of a polynomial function given its graph

SECTION NAMES (NUMBER OF EXERCISES) AND LEARNING OBJECTIVES
4.6 Rational Functions and Their Graphs (40) Find the domain and intercepts of rational functions Identify vertical asymptotes of rational functions Identify horizontal asymptotes of rational functions Use transformations to sketch the graphs of rational functions Find 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 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 Solve applications involving exponential functions
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 (40) Expand and evaluate logarithmic expressions using properties of logarithms Condense and evaluate logarithmic expressions using properties of logarithms Solve logarithmic equations using the logarithm property of equality Use the change of base formula to approximate logarithmic expressions Use the change of base formula to solve logarithmic equations
5.4 Exponential and Logarithmic Equations (48) Solve exponential equations Solve logarithmic equations
5.5 Applications of Exponential and Logarithmic Functions (19) Solve applications involving compound interest Solve 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 variables Solve systems of linear equations using the substitution method Solve systems of linear equations using the elimination method Solve systems of linear equations in two variables using either method Solve applications using a system of linear equations