7/18/2022 DATE

☐ REQUIRED COURSE

☑ ELECTIVE COURSE

MSD DIVISION

☐ NEW COURSE

☑ REVISION

Lake Land College

Course Information Form

COURSE NUMBER:	MAT-129		**TITLE:** *(30 Characters Max)*		College Algebra Pathway					**ECH:**	6
SEM CR HRS:	5	**Lecture:**	4	**Lab:**	2						
Course Level:	☐ Gen Ed / IAI ☐ Career/Technical ☑ Baccalaureate /Non-IAI ☐ Dev Ed/ Not in Degree Audit			**Clinical Practicum:**	0	**Work-based Learning**	0	**WBL ECH:**	**0**		
COURSE PCS #	11 - 27.0101		**IAI Code**					**Contact Hours Per Week**			
Repeatable (Y/N):	N	**Pass/Fail (Y/N):**	N	**Variable Credit (Y/N):**		**Min:**		**Max:**		**16 Wks**	300	**8 Wks**	600
Prerequisites:	Placement by Assessment or either MAT-115 or MAT-124 with a grade of "C" or higher or STEM Transitional Math (TM001). Also one year of high school geometry or MAT-009										
Catalog Description: (40 Word Limit)	Develop concepts of a function and graph, inverse, exponential and logarithmic functions, theory of equations, systems of equations, sequences and series. Graphing calculator required. Intended for students that don't assess directly into MAT-130 College Algebra. Includes supplemental instruction lab.										

List the Major Course Segments (Units)	Contact Lecture Hours	Contact Lab Hours	Clinical Practicum	Work-based Learning
Functions and Their Graphs	12	6		
Solving Equations and Inequalities	12	6		
Polynomials and Rational Functions	13	7		
Exponential and Logarithmic Functions	15	7		
Systems of Equations	6	3		
Sequences and Series	2	1		
TOTAL	60	30	0	0

EVALUATION							
QUIZZES	☑	**EXAMS**	☑	**ORAL PRES**	☐	**PAPERS**	☐
LAB WORK	☐	**PROJECTS**	☐	**COMP FINAL**	☑	**OTHER**	☐

COURSE MATERIALS	
TITLE:	Algebra and Trigonometry: Real Mathematics, Real People
AUTHOR:	Ron Larson
PUBLISHER:	Brooks/Cole Cengage Learning
VOLUME/EDITION/URL:	7th
COPYRIGHT DATE:	2016

MAJOR COURSE SEGMENT	HOURS	LEARNING OUTCOMES
		The student will Demonstrate:
Functions and Their Graphs		• Recognize the rectangular coordinate system. •Graph equations y = f(x) manually and on a graphing calculator. • Apply graphs to find zeros of an equation • Show distinction between relation and function. • Find domain and range from graph or rule of a relation. • Show slope of a line. • Recognize forms of line equation point-slope, slope-intercept, vertical line, general. • Graph linear functions manually and on a graphing calculator • Calculate average rate of change. • Demonstrate and Showing of function graphs, their transformations, and their properties • Show one-to-one functions • Recognize when an inverse exists and form the inverse when possible
Graphs of Equations	2	
Lines in the Plane	3	
Functions	3	
Graphs of Functions	3	
Transformations of Graphs	3	
Combinations and Compositions of Functions	2	
Inverse Functions	2	

Solving Equations and Inequalities		
Linear Functions and Problem Solving	3	• Set up and solve word problems for linear functions • Demonstrate ability to solve equations using INTERSECT feature on a graphing calculator • Show the complex numbers and their operations •Solve quadratic equations by completing the square, factoring, and quadratic formula • Recognize how to solve radical and absolute value equations • Solve inequalities and graph the solution set using interval and set notation • Find lines of best fit using the graphing calculator and Apply this for predictions.
Solving equations graphically	2	
Complex Numbers	2	
Solving Quadratic Equations Algebraically	4	
Solving Other Types of Equations	3	
Solving Inequalities	3	
Linear Models and Scatterplots	1	
Polynomials and Rational Functions		• Find vertex, axis of symmetry, and intercepts of a quadratic function both manually and on a graphing calculator and apply to word problems. • Recognize characteristics of power functions f(x) = xn. • Identify polynomials and their degrees and zeros. • Analyze graphs of polynomials. • Perform polynomial division by long and by synthetic division. • Apply remainder, factor, rational zeros, boundedness, and intermediate value theorems to analyze real zeros of a polynomial. • Construct polynomial with specified zeros. • Find domain and analyze graph of a rational function.
Quadratic Functions	4	
Polynomial Functions of Higher Degree	3	
Reals Zeros of Polynomial Functions	3	
Fundamental Theorem of Algebra	3	
Rational Functions and Asymptotes	3	
Graphs of Rational Functions	4	
Logarithmic Functions & Exponential Models		
Exponential Functions and Graphs	5	• Evaluate and graph exponential functions. • Model exponential growth/decay and compare two functions using growth rates. • Find exponential models for data using graphing calculator and determine if it is appropriate. • Show connection between exponential and logarithmic expressions. • Evaluate and graph logarithmic equations. • Show properties of logarithms. • Apply Change of Base Theorem for logarithmic bases other than 10 and e. • Solve logarithmic and exponential equations both manually and on a graphing calculator.
Logarithmic Functions and Graphs	4	
Properties of Logarithms	4	
Solving Exponential and Logarithmic Equations	4	
Exponential and Logarithmic Models	5	
Systems of Equations		• Solve 2 x 2 and 3 x 3 systems of linear equations by substitution or eliminations • Solve systems of equations on a graphing
Solving Systems of Equations	3	

Systems of Linear Equations in Two Variables	3	calculator • Solve a system of non-linear equations
Systems of Non-Linear Equations	3	
Sequences and Series		• Show infinite sequences, factorial notation, sigma notation, and series
Sequences and Series	3	
	90	

Lab hours will provide individualized and group instruction on pre-requisite skills and foundational knowledge needed for MAT-130 College Algebra.

COURSE OUTCOMES*	At the successful completion of this course, students will Demonstrate:

- Demonstrate an understanding of function graphs, their transformations, and their properties
- Identify the domain and range of a function, recognize when an inverse function exists, and form the inverse when possible
- Graph quadratic, polynomial, rational, exponential, and logarithmic functions and demonstrate, through application to real-world situations, knowledge of the properties of these functions
- Show appropriate theorems and techniques to locate the roots of second and higher degree polynomial equations
- Apply the algebraic and graphing techniques learned in this course to solve applications encountered in subsequent math courses
- Apply technology appropriately in problem solving and in exploring and developing mathematical concepts

** Course Outcomes will be Applyd in the Assessment Software for Outcomes Assessment. Limit to 3 - 5.*