7/18/2022   DATE

☐ REQUIRED COURSE
☑ ELECTIVE COURSE

MSD   DIVISION
☐ NEW COURSE
☑ REVISION

Lake Land College
Course Information Form

COURSE NUMBER:	MAT-130		TITLE: *(30 Characters Max)*	College Algebra		
SEM CR HRS:	4	Lecture:	4		Lab: 0	ECH: 4

Course Level:	☐ Gen Ed / IAI ☑ Baccalaureate /Non-IAI	☐ Career/Technical ☐ 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 (Minutes/Week)	
Repeatable (Y/N):	N	Pass/Fail (Y/N): N	Variable Credit (Y/N): N	Min:	Max:	16 Wks	200
						8 Wks	400

Prerequisites:	Placement by Assessment. Also one year of high school geometry or MAT-009.
Corequisite	None
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.

List the Major Course Segments (Units)	Contact Lecture Hours	Contact Lab Hours	Clinical Practicum	Work-based Learning
Functions and Their Graphs	12			
Solving Equations and Inequalities	12			
Polynomials and Rational Functions	13			
Exponential and Logarithmic Functions	15			
Systems of Equations	6			
Sequences and Series	2			
TOTAL	60	0	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 be able to:
Functions and Their Graphs		1. Recognize the rectangular coordinate system.
Graphs of Equations	1	2. Graph equations y = f(x) manually and on a graphing calculator. 3. Apply graphs to find zeros of an equation
Lines in the Plane	2	4. Show distinction between relation and function. 5. Find domain and range from graph or rule of a relation.
Functions	2	6. Show slope of a line. 7. Recognize forms of line equation point-slope, slope-intercept, vertical line, general.
Graphs of Functions	2	8. Graph linear functions manually and on a graphing calculator
Transformations of Graphs	2	9. Calculate average rate of change. 10. Demonstrate and Showing of function graphs, their transformations, and their properties
Combinations and Compositions of Functions	1	11. Show one-to-one functions 12. Recognize when an inverse exists and form the inverse when possible
Inverse Functions	2	

Solving Equations and Inequalities		
Linear Functions and Problem Solving	2	1. Set up and solve word problems for linear functions
Solving equations graphically	1	2. Demonstrate ability to solve equations using INTERSECT feature on a graphing calculator
Complex Numbers	1	3. Show the complex numbers and their operations
Solving Quadratic Equations Algebraically	3	4. Solve quadratic equations by completing the square, factoring, and quadratic formula
Solving Other Types of Equations	2	5. Recognize how to solve radical and absolute value equations
Solving Inequalities	2	6. Solve inequalities and graph the solution set using interval and set notation
Linear Models and Scatterplots	1	7. Find lines of best fit using the graphing calculator and Apply this for predictions.
Polynomials and Rational Functions		
Quadratic Functions	2	1. Find vertex, axis of symmetry, and intercepts of a quadratic function both manually and on a graphing calculator and apply to word problems.
Polynomial Functions of Higher Degree	2	2. Recognize characteristics of power functions $f(x) = x^n$.
Reals Zeros of Polynomial Functions	2	3. Identify polynomials and their degrees and zeros. 4. Analyze graphs of polynomials.
Fundamental Theorem of Algebra	2	5. Perform polynomial division by long and by synthetic division. 6. Apply remainder, factor, rational zeros, boundedness, and intermediate value theorems to analyze real zeros of a polynomial.
Rational Functions and Asymptotes	2	7. Construct polynomial with specified zeros. 8. Find domain and analyze graph of a rational function.
Graphs of Rational Functions	3	
Logarithmic Functions & Exponential Models		
Exponential Functions and Graphs	3	1. Evaluate and graph exponential functions. 2. Model exponential growth/decay and compare two functions using growth rates.
Logarithmic Functions and Graphs	3	3. Find exponential models for data using graphing calculator and determine if it is appropriate.
Properties of Logarithms	3	4. Show connection between exponential and logarithmic expressions. 5. Evaluate and graph logarithmic equations. 6. Show properties of logarithms.
Solving Exponential and Logarithmic Equations	3	7. Apply Change of Base Theorem for logarithmic bases other than 10 and e.
Exponential and Logarithmic Models	3	8. Solve logarithmic and exponential equations both manually and on a graphing calculator.
Systems of Equations		
Solving Systems of Equations	2	1. Solve 2 x 2 and 3 x 3 systems of linear equations by substitution or eliminations
Systems of Linear Equations in Two Variables	2	2. Solve systems of equations on a graphing calculator 3. Solve a system of non-linear equations
Systems of Non-Linear Equations	2	
Sequences and Series		
Sequences and Series	2	1. Show infinite sequences, factorial notation, sigma notation, and series
	60	

Outcomes*	At the successful completion of this course, students will be able to:
Course Outcome	Demonstrate an understanding of function graphs, their transformations, and their properties
Course Outcome	Identify the domain and range of a function, recognize when an inverse function exists, and form the inverse when possible
Course Outcome	Graph quadratic, polynomial, rational, exponential, and logarithmic functions and demonstrate, through application to real-world situations
Course Outcome	Show appropriate theorems and techniques to locate the roots of second and higher degree polynomial equations
Course Outcome	Apply the algebraic and graphing techniques learned in this course to solve applications encountered in subsequent math courses
Course Outcome	Apply technology appropriately in problem solving and in exploring and developing mathematical concepts
Program Outcome	
Laker Learning Competency	

Course and program outcomes will be used in the software for outcomes assessment and should include at least 1 Laker Learning Competency. Limit to 3 - 5.