

2/14/2025

DATE

REQUIRED COURSE

ELECTIVE COURSE

MSD DIVISION

 NEW COURSE REVISION

# Lake Land College

## Course Information Form

<b>COURSE NUMBER:</b>	MAT-129	<b>TITLE: (30 Characters Max)</b>	College Algebra Pathway						
<b>SEM CR HRS:</b>	5.0	<b>Lecture:</b>	4.0	<b>Lab:</b>	2.0	<b>ICCB Lab:</b>	2.0	<b>ECH:</b>	6.0
<b>Course Level:</b>	<input type="checkbox"/> Gen Ed / IAI <input type="checkbox"/> Career/Technical <input checked="" type="checkbox"/> Baccalaureate /Non-IAI <input type="checkbox"/> Dev Ed/ Not in Degree Audit		<b>Clinical Practicum:</b>	0.0	<b>Work-based Learning</b>	0.0	<b>WBL ECH:</b>	0.0	
<b>Course PCS &amp; CIP:</b>	11 - 27.0101		<b>IAI Code:</b>	N/A		<b>Contact Hours (Minutes/Week)</b>			
<b>Repeatable (Y/N):</b>	N	<b>Pass/Fail (Y/N):</b>	N	<b>Variable Credit (Y/N):</b>	N	<b>Min:</b>		<b>Max:</b>	
						<b>16 Wks</b>	300	<b>8 Wks</b>	600
<b>Prerequisites:</b>	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.								
<b>Corequisites:</b>	None								
<b>Catalog Description: (40 Word Limit)</b>	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 who do not 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		
<b>TOTAL</b>	<b>60</b>	<b>30</b>	<b>0</b>	<b>0</b>

### EVALUATION

<b>QUIZZES</b>	<input checked="" type="checkbox"/>	<b>EXAMS</b>	<input checked="" type="checkbox"/>	<b>ORAL PRES</b>	<input type="checkbox"/>	<b>PAPERS</b>	<input type="checkbox"/>
<b>LAB WORK</b>	<input type="checkbox"/>	<b>PROJECTS</b>	<input type="checkbox"/>	<b>COMP FINAL</b>	<input checked="" type="checkbox"/>	<b>OTHER</b>	<input type="checkbox"/>

### COURSE MATERIALS

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

MAJOR COURSE SEGMENT	HOURS	LEARNING OUTCOMES
		<i>The student will demonstrate:</i>
<b>Functions and their graphs</b>		
Graphs of equations	2	1. Identify the rectangular coordinate system. 2. Graph equations $y = f(x)$ manually and on a graphing calculator.
Lines in the plane	3	3. Apply graphs to find zeros of an equation 4. Show distinction between relation and function. 5. Find domain and range from graph or rule of a relation.
Functions	3	6. Show slope of a line. 7. Identify forms of line equation point-slope, slope-intercept, vertical line and general.
Graphs of functions	3	8. Graph linear functions manually and on a graphing calculator.
Transformations of graphs	3	9. Calculate average rate of change. 10. Demonstrate function graphs, their transformations and their properties.
Combinations and compositions of functions	2	11. Show one-to-one functions.
Inverse functions	2	12. Identify when an inverse exists and form the inverse when possible.

<b>Solving equations and inequalities</b>			
Linear functions and problem solving	3		
Solving equations graphically	2	<ol style="list-style-type: none"> <li>1. Set up and solve word problems for linear functions.</li> <li>2. Solve equations using INTERSECT feature on a graphing calculator.</li> <li>3. Show the complex numbers and their operations.</li> <li>4. Solve quadratic equations by completing the square, factoring and quadratic formula.</li> <li>5. Solve radical and absolute value equations.</li> <li>6. Solve inequalities and graph the solution set using interval and set notation.</li> <li>7. Find lines of best fit using the graphing calculator.</li> <li>8. Apply this for predictions.</li> </ol>	
Complex numbers	2		
Solving quadratic equations algebraically	4		
Solving other types of equations	3		
Solving inequalities	3		
Linear models and scatterplots	1		
<b>Polynomials and rational functions</b>			
Quadratic functions	4		<ol style="list-style-type: none"> <li>1. Find vertex, axis of symmetry and intercepts of a quadratic function both manually and on a graphing calculator and apply to word problems.</li> <li>2. Identify characteristics of power functions <math>f(x) = x^n</math>.</li> <li>3. Identify polynomials and their degrees and zeros.</li> <li>4. Analyze graphs of polynomials.</li> <li>5. Perform polynomial division by long and by synthetic division.</li> <li>6. Apply remainder, factor, rational zeros, boundedness and intermediate value theorems to analyze real zeros of a polynomial.</li> <li>7. Construct polynomial with specified zeros.</li> <li>8. Find domain and analyze graph of a rational function.</li> </ol>
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		
<b>Exponential and logarithmic functions</b>			
Exponential functions and graphs	5	<ol style="list-style-type: none"> <li>1. Evaluate and graph exponential functions.</li> <li>2. Model exponential growth/decay and compare two functions using growth rates.</li> <li>3. Find exponential models for data using graphing calculator and determine if it is appropriate.</li> <li>4. Show connection between exponential and logarithmic expressions.</li> <li>5. Evaluate and graph logarithmic equations.</li> <li>6. Show properties of logarithms.</li> <li>7. Apply Change of Base Theorem for logarithmic bases other than 10 and e.</li> <li>8. Solve logarithmic and exponential equations both manually and on a graphing calculator.</li> </ol>	
Logarithmic functions and graphs	4		
Properties of logarithms	4		
Solving exponential and logarithmic equations	4		
Exponential and logarithmic models	5		
<b>Systems of equations</b>			
Solving systems of equations	3	<ol style="list-style-type: none"> <li>1. Solve <math>2 \times 2</math> and <math>3 \times 3</math> systems of linear equations by substitution or eliminations.</li> <li>2. Solve systems of equations on a graphing calculator.</li> <li>3. Solve a system of non-linear equations.</li> </ol>	
Systems of linear equations in two variables	3		
Systems of non-linear equations	3		

<b>Sequences and series</b>	3	1. Show infinite sequences, factorial notation, sigma notation and series
90		

<b>Outcomes*</b>	<b>Outcome Title</b>	<b>At the successful completion of this course, students will be able to:</b>
Course Outcome 1	Function Graphs	Demonstrate function graphs, their transformations and their properties.
Course Outcome 2	Domain Range	Identify the domain and range of a function, forming the inverse function when it exists.
Course Outcome 3	Real-world Applic	Graph quadratic, polynomial, rational, exponential and logarithmic functions, demonstrating the properties of these functions through real-world situations.
Course Outcome 4	Polynomial Roots	Show appropriate theorems and techniques to locate the roots of second- and higher-degree polynomial equations.
Course Outcome 5	Subsequent Math	Apply the algebraic and graphing techniques to solve applications encountered in subsequent math courses.
Course Outcome 6	Technology Applic	Apply technology appropriately in problem solving and in exploring and developing mathematical concepts.
Primary Laker Learning Competency	Creative Thinking & Problem Solving: Students think creatively to solve problems.	
Secondary Laker Learning Competency	Quantitative Literacy: Students analyze data and mathematical patterns in real-life situations.	

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