Subject:	PASS
Course Number:	518
Descriptive Title:	Pre-Calculus Academy
Division:	Library and Learning Resources
Department:	Pathways to Academic Success
Course Disciplines:	Mathematical Sciences
Catalog Description:	This course covers polynomial, rational, exponential, logarithmic, and trigonometric functions, as well as their inverses.
Prerequisite:	
Co-requisite:	
Recommended Preparation:	
Enrollment Limitation:	
Hours Lecture (per week):	2.33
Hours Laboratory (per week):	0.3
Outside Study Hours:	0
Total Course Hours:	48
Course Units:	0 units
Grading Method:	Pass/No Pass/SP
Credit Status:	Noncredit
Transfer CSU:	No
Effective Date:	
Transfer UC:	No
Effective Date:	
General Education ECC:	
Term:	
Other:	
CSU GE:	
Term:	
Other:	
IGETC:	
Term:	
Other:	
Student Learning Outcomes:	Upon completion of the course, students will be able to:

	1) Demonstrate basic pre-calculus concepts by solving equations, inequalities and systems involving algebraic, exponential, logarithmic, and trigonometric. 2) Set up and solve polynomial, rational, exponential, logarithmic, and trigonometric equations and functions. 3) Create and analyze the graphs of polynomial, rational, exponential, logarithmic, and trigonometric function
Course Objectives:	1. Analyze functions (including polynomial, algebraic, rational, exponential, logarithmic, trigonometric) for critical features, including: intercepts, asymptotes, domain, range, and average rate of change. 2. Determine the inverse of a function (polynomial, algebraic, rational, exponential, logarithmic, trigonometric) and analyze it in terms of critical features. 3. Graph relations (including polynomial, rational, exponential, logarithmic, trigonometric functions and conics), using transformations (shifting, stretching, reflection). 4. Solve equations involving polynomial, rational, exponential, logarithmic, and trigonometric functions. 5. Use technology (graphing, scientific calculators or computer software) to solve problems

Major Topics:	I. ALGEBRAIC EXPRESSIONS, EQUATIONS, AND INEQUALITIES (5 hours, Lecture)
	      A. Factorization and simplification of expressions with fractional exponents
	      B. Simplification of compound rational expressions
	      C. Solutions of linear and nonlinear inequalities
	II. OPERATIONS & APPLICATIONS (2 hours, Lab)
	
	    A. Equations
	
	    B. Inequalities
	
	III. FUNCTIONS AND THEIR GRAPHS (8 hours, Lecture)
	      A. Graphs of functions including piecewise-defined functions; domain and range
	      B. Transformations of functions; even and odd functions
	      C. Increasing and decreasing functions
	      D. Composition of functions and their domains
	      E. One-to-one functions, inverse functions, and graphs of inverse functions
	IV. POLYNOMIAL AND RATIONAL FUNCTIONS (10 hours, Lecture)
	      A. Graphs of polynomial and rational functions
	      B. Polynomial long division and synthetic division
	      C. The Remainder Theorem and The Factor Theorem
	      D. Determination of the real and complex zeros of polynomial equations
	      E. The Fundamental Theorem of Algebra
	      F. Complex numbers
	V. OPERATIONS & APPLICATIONS (2 hours, Lab)
	
	    A. Graphing of Polynomials

	B. Complex numbers

	VI. EXPONENTIAL AND LOGARITHMIC FUNCTIONS (8 hours, Lecture)
	    A. Defining, evaluating, and simplifying exponential and logarithmic functions
	    B. Solving exponential and logarithmic equations
	    C. Graphs of exponential and logarithmic functions
	    D. Modeling application problems using exponential and logarithmic functions.
	VII. SOLVING (2 hours, Lab)
	
	    A. Exponential equations
	
	    B. Logarithmic equations
	
	VIII. TRIGONOMETRIC FUNCTIONS (11 hours, Lecture)
	    A. Unit circle trigonometry
	    B. Defining, evaluating, and simplifying trigonometric expressions
	    C. Finding solutions to trigonometric equations
	    D. Graphs of trigonometric functions and their transformations (amplitude, period, and phase shift)
	    E. Trigonometric identities, including the addition, subtraction, double-angle, and half-angle formulas.
	    F. Inverse trigonometric functions
	    G. Applications and modeling using trigonometric function.

Total Lecture Hours:	42
Total Laboratory Hours:	6
Total Hours:	48
Primary Method of Evaluation:	2) Problem solving demonstrations (computational or non-computational)
Typical Assignment Using Primary Method of Evaluation:	Find the domain of each rational function. $R(x) = 4x /(x-3)$
Critical Thinking Assignment 1:	Average Cost: Suppose that the daily cost C of manufactureing e-Bike is given by $C(x)=80x+5000$. The the average dialy $A(x)=(80x+500)/x$. How many e-Bike must be produced each day for the average cost to be no more than \$100?
Critical Thinking Assignment 2:	The inequality $x^4+1 < -5$ has no solutions. Explain why?
Other Evaluation Methods:	Class Performance, Completion, Homework Problems, Quizzes
If Other:	
Instructional Methods:	Demonstration, Discussion, Lecture, Multimedia presentations
If other:	
Work Outside of Class:	Skill practice
If Other:	

Up-To-Date Representative Texts:	Teacher-generated materials.
Alternative Texts:	N/A
Required Supplementary Readings:	N/A
Other Required Materials:	
Requisite Category	
Requisite course:	N/A
Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).	N/A
Requisite Skill:	N/A
Requisite Skill and Matching skill(s): Bold the requisite skill(s). if applicable	N/A
Requisite course:	N/A
Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).	N/A
Requisite Skill:	N/A
Requisite Skill and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s). if applicable	N/A
Enrollment Limitations and Category:	N/A
Enrollment Limitations Impact:	N/A
Course Created by:	Malinni Roeun
Date:	03/21/2024
Original Board Approval Date:	11/18/2024
Effective Term:	SP 2025