MATH A135: FOUNDATIONS FOR CALCULUS 1

Item	Value
Curriculum Committee Approval Date	12/04/2024
Top Code	170100 - Mathematics, General
Units	4 Total Units
Hours	72 Total Hours (Lecture Hours 72)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)

Course Description

This course is designed to provide students with necessary skills to succeed in Calculus 1. These skills are traditionally taught in Algebra and Trigonometry. Algebra topics taught include linear, quadratic, rational, logarithmic, and exponential functions and their graphs. Topics from Trigonometry include trigonometric and inverse trigonometric functions, graphs of trigonometric functions, identities, and solving equations. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Students will be able to factor a quadratic polynomial.
2. Students will be able to graph exponential and logarithmic functions.
3. Students will be able to solve trigonometric equations.

Course Objectives

- 1. Solve linear equations
- 2. Graph linear and quadratic functions
- 3. Add, subtract, multiply and divide functions as well as to determine the domain and range of functions
- 4. Solve exponential and logarithmic equations
- 5. Evaluate trigonometric functions for special angles in degrees and radians
- 6. Apply circular functions to the unit circle
- 7. Graph the six basic trigonometric functions applying changes in period, amplitude, and translations
- 8. Use identities to manipulate and simplify trigonometric expression
- 9. Solve trigonometric equations

Lecture Content

Lines Find the equation of a line Functions The Composition of functions Difference Quotient Inverse Functions Polynomials and Factoring Factor expressions with negative and rational exponents Solve quadratic equations Factoring Completing the Square Quadratic Formula Equations Reducible to Quadratic Form (substitution) Graph parabolic functions including finding the vertices and x-intercepts Rational Expressions Operations with Algebraic Fractions Simplifying Addition and Subtraction Multiplication and Division Simplifying Complex Fractions Solve equations involving rational expressions Polynomial Long Division and Division by a Monomial Solving Equations and Inequalities Polynomial and Rational Inequalities Solving systems of equations in 2 and 3 variables Radicals and Rational Exponents Perform operations on radical expressions and rational exponents Solve equations involving radicals Graph Radical Functions Logarithmic and Exponential Functions Definitions and properties Use properties to manipulate expressions Graphs of logarithmic and exponential functions Solving equations containing logarithmic of exponentials expressions Unit Circle Trigonometry Define Trigonometric functions of angles in standard position in the rectangular coordinate system and in the unit circle Evaluate trigonometric functions using special right triangles and the unit circle Graphing Trigonometric Functions Graph the Six Trigonometric Functions Inverse Trigonometric Functions Definition of Inverse Trigonometric Functions Evaluating Inverse Trigonometric Functions Graph of Inverse Tangent Know and Apply Trigonometric Identities Pythagorean Identities Double Angle Identities Trigonometric Equations Solve trigonometric equations Graph Functions Graph Reciprocal Radicals Absolute Value Exponentials Logarithms Sine, cosine, and tangent Piecewise defined functions Stretch/Compression/ Shift of functions listed in section M part a.

Method(s) of Instruction

- Lecture (02)

Instructional Techniques

Lecture, discussion, written homework

Reading Assignments

Assigned from textbook. 1 hour

Writing Assignments

Writing is encouraged throughout the course but is not necessarily a part of the grading or exams. 1hour

Out-of-class Assignments

Assigned written homework, problem solving exercises. 6 hours

Demonstration of Critical Thinking

Several written tests and a comprehensive final

Required Writing, Problem Solving, Skills Demonstration

Writing is encouraged throughout the course but is not necessarily a part of the grading or exams.

Eligible Disciplines

Mathematics: Master's degree in mathematics or applied mathematics OR bachelor's degree in either of the above AND master's degree in statistics, physics, or mathematics education OR the equivalent. Master's degree required.

Textbooks Resources

1. Required Sullivan, M. Algebra and Trigonometry, 12 ed. Pearson, 2024