PreCalculus COURSE DESCRIPTION

Chapter 1 – Functions from a Calculus Perspective
Lesson 1 – Functions
Lesson 2 - Analyzing Graphs of Functions and Relations
Lesson 3 - Continuity, End Behavior, and Limits
Lesson 4 - Extrema and Average Rates of Change
Lesson 5 - Parent Functions and Transformations
Lesson 6 - Function Operations and Composition of Functions
Lesson 7 – Inverse Relations and Functions

Chapter 2 - Power, Polynomial, and Rational Functions
Lesson 1 - Power and Radical Functions
Lesson 2 - Polynomial Functions
Lesson 3 - The Remainder and Factor Theorems
Lesson 4 - Zeros of Polynomial Functions
Lesson 5 - Rational Functions
Lesson 6 - Nonlinear Inequalities

Chapter 3 - Exponential and Logarithmic Functions
Lesson 1 - Exponential Functions
Lesson 2 - Logarithmic Functions
Lesson 3 - Properties of Logarithms
Lesson 4 - Exponential and Logarithmic Equations
Lesson 5 - Modeling with Nonlinear Regression

Chapter 4 - Trigonometric Identities and Equations
Lesson 1 - Right Triangle Trigonometry
Lesson 2 - Degrees and Radians
Lesson 3 - Trigonometric Functions on the Unit Circle
Lesson 4 - Graphing Sine and Cosine Functions
Lesson 5 - Graphing Other Trigonometric Functions
Lesson 6 - Inverse Trigonometric Functions
Lesson 7 - The Law of Sines and the Law of Cosines

Chapter 5 - Trigonometric Identities and Equations
Lesson 1 - Trigonometric Identities
Lesson 2 - Verifying Trigonometric Identities
Lesson 3 - Solving Trigonometric Equations
Lesson 4 - Sum and Difference Identities
Lesson 5 - Multiple-Angle and Product-to-Sum Identities

Chapter 6 - Systems of Equations and Matrices
Lesson 1 - Multivariable Linear Systems and Row Operations
Lesson 2 - Matrix Multiplication, Inverses, and Determinants
Lesson 3 - Solving Linear Systems Using Inverses and Cramer's Rule
Lesson 4 - Partial Fractions
Lesson 5 - Linear Optimization

Chapter 7 - Conic Sections and Parametric Equations
Lesson 1 - Parabolas
Lesson 2 - Ellipses and Circles
Lesson 3 - Hyperbolas
Lesson 4 - Rotations of Conic Sections
Lesson 5 - Parametric Equations

Chapter 8 - Vectors
Lesson 1 - Introduction to Vectors
Lesson 2 - Vectors in the Coordinate Plane
Lesson 3 - Dot Products and Vector Projections
Lesson 4 - Vectors in Three-Dimensional Space
Lesson 5 - Dot and Cross Products of Vectors in Space

Chapter 9 - Polar Coordinates and Complex Numbers
Lesson 1 - Polar Coordinates
Lesson 2 - Graphs of Polar Equations
Lesson 3 - Polar and Rectangular Forms of Equations
Lesson 4 - Polar Forms of Conic Sections
Lesson 5 - Complex Numbers and De Moivre's Theorem

Chapter 10 - Sequences and Series
Lesson 1 - Sequences, Series, and Sigma Notation
Lesson 2 - Arithmetic Sequences and Series
Lesson 3 - Geometric Sequences and Series
Lesson 4 - Mathematical Induction
Lesson 5 - The Binomial Theorem
Lesson 6 - Functions as Infinite Series

Chapter 11 - Inferential Statistics
Lesson 1 - Descriptive Statistics
Lesson 2 - Probability Distributions
Lesson 3 - The Normal Distribution
Lesson 4 - The Central Limit Theorem
Lesson 5 - Confidence Intervals
Lesson 6 - Hypothesis Testing
Lesson 7 - Correlation and Linear Regression

Chapter 12 - Limits and Derivatives
Lesson 1 - Estimating Limits Graphically
Lesson 2 - Evaluating Limits Algebraically
Lesson 3 - Tangent Lines and Velocity
Lesson 4 - Derivatives
Lesson 5 - Area Under a Curve and Integration
Lesson 6 - The Fundamental Theorem of Calculus