PreCalculus SYLLABUS

COURSE DESCRIPTION:

Precalculus serves as a bridge between Algebra II and Calculus, uniting advanced algebraic concepts with foundational ideas from geometry and trigonometry. The course emphasizes mathematical reasoning, problem-solving, and modeling real-world situations using functions, graphs, and analytical tools. Students will extend their understanding of polynomial, rational, exponential, logarithmic, and trigonometric functions while exploring sequences, series, and conic sections.

Through graphical and algebraic analysis, students will deepen their understanding of limits, vectors, polar coordinates, and parametric equations—concepts essential for success in Calculus. Students will also strengthen their ability to use technology, symbolic reasoning, and multiple representations to solve complex problems and communicate mathematical ideas effectively.

(Texas TEKS reference: §111.42. Precalculus)

COURSE OBJECTIVES:

Students will:

- Analyze and apply properties of polynomial, rational, exponential, logarithmic, and trigonometric functions.
- Explore transformations and compositions of functions, including inverses and piecewise definitions.
- Model and solve real-world problems using systems of equations and inequalities.
- Develop proficiency with trigonometric identities, the unit circle, and laws of sines and cosines.
- Investigate conic sections and their applications.
- Work with sequences, series, and sigma notation to describe patterns and summations.
- Represent and analyze vectors, polar coordinates, and parametric equations.
- Strengthen reasoning, precision, and problem-solving skills to prepare for higher-level mathematics.

COURSE OUTLINE:

Semester 1	Semester 2
▪ Review of Functions and Transformations ▪ Polynomial and Rational Funtions ▪ Inverse Functions and Compositions ▪ Exponential and Logarithmic Functions ▪ Systems of equations and Inequalities ▪ Analytic Trigonometry and the Unit Circle ▪ Graphing Trig Functions ▪	▪ Trig Identities and Equations ▪ Low of sines and cosines ▪ Conics ▪ Sequences and Series ▪ Vectors and Polar Coordinates ▪ Parametric Equations and applications ▪ Limits and Introduction to Calculus (after the AP exam)