Year Long Course Plan

Department: Mathematics **Course: Honors Algebra II/Trigonometry 434/435**

Essential Learning Outcomes: After successfully completing this course, students will be able to:

1) Analyze and generalize patterns and represent them with algebraic expressions and equations.
2) Solve various equations and inequalities.
3) Model, solve and interpret mathematical and real world problems by using algebraic expressions, equations and inequalities.
4) Graph a variety of mathematical functions using the parent function and transformations.
5) Use appropriate technology to, problem solve, analyze and interpret mathematical concepts.
6) Use appropriate statistical methods to analyze data.
7) Communicate their understanding of mathematics.

Quarter 1	*Quarter 2*
Unit 1: Linear Equations • Solving linear equations and inequalities • Solving absolute value equations and inequalities • Problem solving with linear equations **Unit 2: Linear Functions in two variables** • Graphing linear functions and inequalities • Graphing absolute value and piece functions • Modeling linear data with a linear function • Writing a computer program to determine the equation of a line **Unit 3: Systems of Linear Equations** • Solving Systems of equations with two or three variables • Linear programming to solve real world problems • Graphing points and planes in three dimensional space • Problem solving with systems of two or three linear equations • Writing a computer program to solve a system of equations **Unit 4: Matrices and their Applications** • Operations with Matrices • Using matrix multiplication to create tables of real life information • Calculating determinants of matrices to solve systems of equations and determine areas of triangles • Calculating inverses of matrices to solve systems of equations and decode messages	**Unit 5: Quadratic Functions** • Solving quadratic equations • Operations with Complex numbers • Graphing quadratic functions • Writing the equation of a quadratic function • Writing a computer program to solve a quadratic equation • Problem solving with quadratic functions **Unit 6: Polynomial Functions** • Operations with polynomial functions. • Solving polynomial equations over the complex number system • Graphing polynomial functions • Writing equations of polynomial functions **Unit 7: Functions** • Laws of rational exponents • Domain and Range • Composition and Inverses of functions • Graphing square root and cube root functions • Solving radical equations **Unit 8: Exponential and Logarithmic functions** • Problem solving with exponential growth and decay models • Graphing exponential and logarithmic functions • Evaluating and simplifying logarithmic expressions using the laws of logarithms • Solving logarithmic and exponential equations • Modeling data with an exponential or logarithmic function
Quarter 3	***Quarter 4***
Unit 9: Rational Functions • Simplifying Rational Expressions • Graphing Rational Functions • Solving Equations with Rational Expressions • Problem Solving with Rational Equations	**Unit 13:** • Problem solving with any triangle and the laws of sines and cosines • Using trigonometry to determine the areas of triangles • Arc length and areas of sectors in real world applications. • Linear and angular velocity in real world applications

Unit 10: Analytical Geometry

- Graphing the conic sections
- Completing the Square to graph
- Writing Equations of the conic sections
- Problem solving with the equations of the conic sections
- Solving Quadratic Systems

Unit 11: Sequences and Series

- Expanding Sequences and Series defined by explicit and recursive formulas
- Writing formulas for arithmetic sequences and series
- Determining the sum of a finite arithmetic series
- Writing formulas for geometric sequences and series
- Determining the sums of finite and infinite geometric series
- Problem Solving with Arithmetic and geometric sequence and sum formulas

Unit 12: Right Triangle Trigonometry

- Problem solving with right triangles and the trigonometric functions and their inverses
- Angles and angle measure angle in radians and degrees
- Evaluating trigonometric functions and their inverses using the unit circle

Unit 14:Trigonometric Graphs

- Graphing trigonometric functions using amplitude, wavelength, vertical and horizontal translations.
- Modeling data with a trigonometric function
- Graphing polar equations
- Graphing parametric equations

Unit 15:Trigonometric Identities

- Using the trigonometric identities to simplify trigonometric expressions
- Using the trigonometric identities to solve trigonometric equations
- Using a graphics approach to solve trigonometric equations