Algebra II

COURSE DESCRIPTION: In this course students will use their prior knowledge from previous courses to learn and apply Algebra II skills. This course will include topics such as functions, radical functions, rational functions, exponential and logarithmic functions, trigonometry, geometry, conic sections, systems of equations, probability, and statistics. Students will apply the skills that they learn in this course to real world situations.

COURSE OBJECTIVES:

- Understand the major topics in Algebra II
- Identify how the major topics in Algebra II relate to real world situations
- Apply the topics in Algebra II to various problems
- Explain how the topics in Algebra II relate to the greater context of mathematics

PREREQUISITES: Algebra I

COURSE LENGTH: Two Semesters

REQUIRED TEXT: No required textbook for this course.

MATERIALS LIST: Java is needed for the embedded graphing calculator applet (GCalc). A free download is available at http://www.java.com/en/download/

COURSE OUTLINE:

Unit I: Linear and Quadratic Functions

- Section 1 - Functions and Relations
- Section 2 - Solving Linear Equations and Inequalities
- Section 3 - Writing and Graphing Linear Functions
- Section 4 - Graphing Quadratic Functions
- Section 5 - Solving Quadratic Functions
- Section 6 - Graphing Zeros and Min/Max Values
- Section 7 - Determining a Quadratic Function

Unit II: Radical Functions

- Section 1 - Roots and Properties of Exponents
- Section 2 - Graphing Radical Functions and Domain and Range
- Section 3 - Solving Radical Equations and Inequalities

Unit III: Rational Functions

- Section 1 - Direct and Inverse Variation
- Section 2 - Graphing Rational Functions and Domain and Range
- Section 3 - Solving Rational Equations and Inequalities

Unit IV: Exponential and Logarithmic Functions

- Section 1 - Comparing Logarithmic and Exponential Functions
- Section 2 - Graphing Exponential Functions and Domain and Range
- Section 3 - Exponential Growth and Decay
- Section 4 - Graphing Logarithmic Functions and Domain and Range
- Section 5 - Solving Exponential and Logarithmic Equations

Unit V: Trigonometric Functions

- Section 1 - Right Triangle Trigonometry
- Section 2 - Basic Angles and Radian Measures
- Section 3 - Trigonometric Values in all Four Quadrants
- Section 4 - Inverse Trigonometric Values
- Section 5 - Graphing Trigonometric Functions

Semester 1 Exam

Unit VI: Systems of Equations and Inequalities

- Section 1 - Matrices and Determinants
- Section 2 - Systems of Equations
- Section 3 - Systems of Inequalities
- Section 4 - Systems of Equations with Three Variables

Unit VII: Geometry

- Section 1 - Geometry of Quadrilaterals

- Section 2 - Geometry of a Triangle
- Section 3 - Geometry of Circles

Unit VIII: Conic Sections

- Section 1 - Introduction to Conic Sections
- Section 2 - Parabolas
- Section 3 - Circles
- Section 4 - Ellipses
- Section 5 - Hyperbolas

Unit IX: Probability and Statistics

- Section 1 - Introduction to Probability
- Section 2 - Permutations and Combinations
- Section 3 - Binomial Theorem
- Section 4 - Statistic Introduction
- Section 5 - The Normal Curve

Unit X: Patterns and Sequences, Logic and Reasoning

- Section 1 - Arithmetic Sequences and Series
- Section 2 - Geometric Sequences and Series

Semester 2 Exam