KENDALL PARK LEARNING CENTER

Course Title: Advanced Algebra II (Advanced Credit)

Course Length: Six weeks (120 hours)

Description:
This course completes the study of elementary algebra and prepares students for the study of advanced mathematics. Algebra II furthers the students' knowledge on the topics covered in Algebra I. Emphasis is placed on developing problem solving skills and applying them outside of the classroom.

The topics addressed by Advanced Algebra II include operating with real as well as imaginary numbers, analyzing the behavior of a variety of functions and using them to model real-life relationships, solving and graphing systems of equations and inequalities, and an introduction to sequences and series.

Prerequisites:
Algebra II is a course offered to students who have successfully completed Geometry with at least a B.

Requirement:
Students must pass with at least A- to receive full credit for this class.

Topics Covered:

- Equations and Inequalities
  - Real Numbers and Number Operations
  - Algebraic Expressions and Models
  - Solving Linear Equations
  - Rewriting Equations and Formulas
  - Problem Solving Using Algebraic Models
  - Solving Linear Inequalities
  - Solving Absolute Value Equations and Inequalities

- Linear Equations and Functions
  - Functions and Their Graphs
  - Slope and Rate of Change
  - Quick Graphs of Linear Equations
  - Writing Equations of Lines
  - Correlation and Best-Fitting Lines
  - Linear Inequalities in Two Variables
  - Piecewise Functions
  - Absolute Value Functions

- Systems of Linear Equations and Inequalities
  - Solving Linear Systems by Graphing
  - Solving Linear Systems Algebraically
  - Graphing and Solving Systems of Linear Inequalities

- Linear Programming
- Graphing Linear Equations in Three Variables
- Solving Systems of Linear Equations in Three Variables

- Matrices and Determinants
  - Matrix Operations
  - Multiplying Matrices
  - Determinants and Cramer's Rule
  - Identity and Inverse Matrices
  - Solving Systems Using Inverse Matrices

- Quadratic Functions
  - Graphing Quadratic Functions
  - Solving Quadratic Equations by Factoring
  - Solving Quadratic Equations by Finding Square Roots
  - Complex Numbers
  - Completing the Square
  - The Quadratic Formula and the Discriminant
  - Graphing and Solving Quadratic Inequalities
  - Modeling with Quadratic Functions

- Polynomials and Polynomial Functions
  - Using Properties of Exponents
  - Evaluating and Graphing Polynomial Functions
  - Adding, Subtracting, and Multiplying Polynomials
  - Factoring and Solving Polynomial Equations
  - The Remainder and Factor Theorems
  - Finding Rational Zeros
  - Using the Fundamental Theorem of Algebra
  - Analyzing Graphs of Polynomial Functions
  - Modeling with Polynomial Functions

- Powers, Roots, and Radicals
  - *n*th Roots and Rational Exponents
  - Properties of Rational Exponents
  - Power Functions and Function Operations
  - Inverse Functions
  - Graphing Square Root and Cube Root Functions
  - Solving Radical Equations
  - Statistics and Statistical Graphs

- Exponential and Logarithmic Functions
  - Exponential Growth
  - Exponential Decay
  - The number *e*
  - Logarithmic Functions
  - Properties of Logarithms

Solving Exponential and Logarithmic Equations
Modeling with Exponential and Power Functions
Logistic Growth Functions

- Rational Equations and Functions
  - Inverse and Joint Variation
  - Graphing Simple Rational Functions
  - Graphing General Rational Functions
  - Multiplying and Dividing Rational Expressions
  - Addition, Subtraction, and Complex Fractions
  - Solving Rational Equations

- Quadratic Relations and Conic Sections
  - The Distance and Midpoint Formulas
  - Parabolas
  - Circles
  - Ellipses
  - Hyperbolas
  - Graphing and Classifying Conics
  - Solving Quadratic Systems

- Sequences and Series
  - An Introduction to Sequences and Series
  - Arithmetic Sequences and Series
  - Geometric Sequences and Series
  - Infinite Geometric Series
  - Recursive Rules for Sequences

- Trigonometric Functions **
  - Right Triangle Trigonometry
  - General Angles and Radian Measure
  - Trigonometry Functions of Any Angle
  - Unit Circle (Supplemental Material)

Text:

Algebra II – Application, Equations, Graphs; McDougal Littell.

New Jersey Department of Education Core Curriculum Standards for Mathematics.
www.state.nj.us/njded/cccs

** This is not taught as part of our core curriculum, however if time permits, it will be covered.