ST. CHARLES NORTH HIGH SCHOOL
COURSE SYLLABUS

COURSE: **Algebra I/ Algebra I Extended**

COURSE CURRICULUM

COURSE DESCRIPTION:

Algebra is a branch of mathematics which studies structure and quantity. Students actively work on guided investigations to develop algebraic concepts and problem solving skills.

UNITS OF STUDY:

- **Unit 1: Functions**

Students will explore nonlinear functions and learn how to describe a function completely. Students will see the shapes and behaviors of several different nonlinear functions. This unit also introduces students to sharing mathematical knowledge with a study team as students work together to solve problems.

- **Unit 2: Linear Relationships**

Unit 2 will focus on the starting value and growth of linear functions. Students will look for connections between the multiple representations of linear functions: table, graph, equation, and situation. In this unit, students will come to a deeper understanding of slope than in previous courses, and students will explore the idea of slope as a rate of change.

- **Unit 3: Simplifying and Solving:**

In this unit students will focus on multiplying expressions. Students will also solve equations that contain products. While these new ideas will be introduced using algebra tiles, students will also develop a method to multiply expressions without using tiles.

- **Unit 4: Systems of Equations**

In this unit, students will learn how to solve word problems by writing a pair of equations, called a system of equations. Then students will solve the system of equations with the same multiple representations you used for solving linear equations: table, graph, and by manipulating the equations. Students will also develop ways to solve different forms of systems, and will learn how to recognize when one method may be more efficient than another. By the end of this unit, students will know multiple ways to find the point of intersection of two lines and will be able to solve systems that arise from different situations.

- **Unit 5: Sequences**

Unit 5 provides students an opportunity to review and strengthen algebra skills while learning about arithmetic and geometric sequences. Early in the unit, students will use familiar strategies such as looking for patterns and making tables to write algebraic equations describing sequences of numbers. Later in the unit, students will develop shortcuts for writing equations for certain kinds of sequences.

- **Unit 6: Modeling Two-Variable Data**

In Unit 6 students will be describing a dependent relationship, called the association, between two numerical variables. Students will use scatterplots of data to create lines and curves that model the data and then use those models to make predictions. Students will mathematically describe the form, direction, strength, and outliers of an association.

- **Unit 7: Exponential Functions**

Unit 7 provides an opportunity for students to learn more about the family of exponential functions. Students will also build more advanced algebra skills, such as solving for an indicated variable, simplifying or rewriting exponential expressions, working with fractional exponents, and finding the exponential function that passes exactly through any pair of given points. Students will learn about several important applications of exponential functions.

- **Unit 8: Quadratic Functions**

In this unit, a quadratics web will challenge students to find connections between the different representations of a quadratic function. Through this endeavor, students will learn how to rewrite quadratic equations in several forms, and how to use a graphing calculator to assist.

- **Unit 9: Solving Quadratics and Inequalities**

Students will start this unit by extending their ability to solve quadratic equations, and deciding which method of solving is most efficient. In addition, students will learn how to deal with special relationships, called inequalities. Students will develop ways to represent solutions to inequalities both algebraically and graphically. Students also will extend their ability to work with mathematical sentences by learning how to write inequalities that describe situations.

- **Unit 10: Solving Complex Equations**

In Unit 10, students will extend their solving skills to include other types of equations, including equations with square roots, absolute values, variables in exponents, and messy fractions. Then students will learn how to determine the number of possible solutions for an equation without actually solving them. Students will also consider "imaginary" solutions to quadratic equations. This unit also focuses on intersections of functions. students will learn how to use the intersection of the graphs of two functions to find the solution to an equation. Then you will solve quadratic and absolute value inequalities.

TEXT: Core Connections Algebra (Second Edition, Version 5.0)

REQUIRED TECHNOLOGY: (Graphing calculator, one of any of the listed is recommended) TI-83, TI-83 Plus, TI-84, TI-84 Plus, TI-84 Plus Sliver Edition

GRADING SCALE:

90% – 100%	A
80% - 89%	B
70% - 79%	C
60% - 69%	D
59% or below	F

GRADING RULES:

40%	Individual Tests
20%	Quizzes
10%	Team Challenges
5%	Homework
5%	Learning Target Checks
20%	Semester Exam