

# Algebra II

**Instructors:**

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This course is intended for students who wish to gain admission to a 4-year college or a 2-year degree program after graduation. Algebra II will cover the fundamentals of Algebra I in more depth, and then will extend into the Algebra II concepts including functions, graphing, polynomials, and probability and statistics. The pace of the course is somewhat slower than that of the Honors Algebra 2 course; however, the full requirement for a four-year college is satisfied. This course should prepare students for Algebra/Trig, Pre-Calculus, or a college level Algebra or Pre-Calculus course.

**Graduation Standards** (the number of the standard is referenced in the performance indicators listed in each unit):

**Standard 1:** Reason and model quantitatively, using units and number systems to solve problems.

**Standard 2:** Interpret, represent, create and solve algebraic expressions.

**Standard 3:** Interpret, analyze, construct, and solve linear, quadratic, and trigonometric functions.

**Standard 5:** Interpret, infer, and apply statistics and probability to analyze data and reach and justify conclusions.

Unit 1	Review of Algebra
Summary	This unit will review the essential skills of Algebra 1 that are needed in Algebra 2. Topics include: solving linear equations, writing and graphing linear equations, systems of equations, and factoring.
Performance Indicators Assessed in Unit	M.2B Write and solve equations and inequalities in one variable M.2E- Writes and graphs linear equations from various forms M.2F- Solves systems of linear equations and inequalities M. Factoring quadratic expressions
Unit 2	Radical Expressions and Equations
Summary	In this unit students will simplify radical expressions. They will create prime factorizations of numbers and simple square roots, as well as nth roots. Radical expression will be used in arithmetic operations. Students will represent radical expressions as expressions with rational exponents and rationalize denominators. Properties of exponents will be revisited, as students work with rational exponents. Negative exponents will be discussed.
Performance Indicators Assessed in Unit	M.1C- Simplifies expressions involving complex numbers. M.2H- Writes and graphs radical equations using various forms.

<b>Unit 3</b>	<b>Review of Quadratics</b>
Summary	This unit is an overview of quadratic equations and functions. Students will solve quadratic equations by graphing, factoring, completing the square, and using the Quadratic Formula. Students will explore how values of a quadratic equation are reflected in a parabola that represents it; they will use equations and graphs to explore quadratic equations that have 0,1, or 2 roots. Students will also relate the value of the discriminant to the number of roots and to whether the roots are rational, irrational or complex.
Performance Indicators Assessed in Unit	M.2I-Solve quadratic equations using various methods M.3C- Graph quadratic functions and identify key features.
<b>Unit 4</b>	<b>Probability and Statistics</b>
Summary	In this unit students will investigate probability. Students will calculate permutations and combinations, and probabilities involving both. They will investigate data displays of 1 variable and 2 variables, line plots, box plots, scatter plots, and frequency tables, regressions and correlation, surveys and sampling techniques.
Performance Indicators Assessed in Unit	M.5F - Summarize, represent, & interpret data M.5D - Compute probabilities and use known probability distributions to problem solve
<b>Unit 5</b>	<b>Polynomials</b>
Summary	In this unit, students will add, subtract, multiply, divide, and factor polynomials. They will analyze and graph polynomial functions. Students will evaluate polynomial functions and solve polynomial equations. Lastly, they will find factors and zeros of polynomial functions.
Performance Indicators Assessed in Unit	M.1C - Simplifies expressions and solves equations involving complex numbers M.2J - Solves polynomial equations using various methods
<b>Unit 6</b>	<b>Rational Expressions</b>
Summary	In this unit, students will use graphs of rational functions to determine characteristics about the equation. Students will simplify rational expressions and solve rational equations. <i>They will also use rational functions to determine characteristics about the graphs.</i>
Performance Indicators Assessed in Unit	M.2K - Simplify and solve rational equations M.3K - Graph Rational Functions and identify key features

Unit 7	Exponents and Logs
Summary	In this unit, students extend their knowledge of functions to creating, graphing, and analyzing exponential and logarithmic functions. They can then use these exponential and logarithmic functions to represent real-world situations, including growth and decay situations. They will also explore the fact that exponential and logarithmic functions are inverses of each other.
Performance Indicators Assessed in Unit	