

# Scope and Sequence

## Mathematics

### Algebra II (300)

#### **Description:**

Building on their work with linear, quadratic, and exponential functions, students extend their repertoire of functions to include polynomial, rational, and radical functions. Students work closely with the expressions that define the functions, and continue to expand and enhance their abilities to model situations and to solve equations, including solving quadratic equations over the set of complex numbers and solving exponential equations using the properties of logarithms. A Texas Instrument graphing calculator is required.

Departmental assessments are given to measure individual student, class, and grade level achievement in math. Data are collected by each teacher and used to monitor progress and make plans for instruction. At the grade level, the data are used to monitor and adjust curriculum and instruction. End of quarter, end of semester, and/or end of course exams may be used.

| Unit Name/Description | Content and/or Skills   |
|-----------------------|---|
| Concepts of Algebra 1 | Solve basic equations, PEMDAS, and properties<br>Classify numbers and polynomials<br>Solve inequality equations, and literal equations<br>Solve absolute value equations<br>Solve absolute value inequalities                                   |
| Graphs of Functions   | Introduction to functions and functional notation<br>Express linear functions in three forms<br>Graph linear functions<br>Given traits, write equations of parallel and perpendicular lines<br>Develop linear models given application problems |

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|  | <p>Find lines of best fit</p> <p>Graph absolute value functions and inequalities</p> <p>Solve absolute value equations on the coordinate plane</p> <p>Translate functions</p>   |
| Systems of Equations                       | <p>Solve two and three variable systems of equations</p> <p>Use matrices to solve systems of equations</p> <p>Solve and graph systems of linear inequalities</p>  |
| Probability, Statistics, and Data Analysis | <p>Convert between ratios and percents</p> <p>Apply proportional reasoning to real world situations</p> <p>Analyze rates of change</p> <p>Interpret and analyze tables, scatter plots and other graphs</p> <p>Calculate measures of central tendency (mean, median, mode) and range</p> <p>Identify confidence intervals</p>  |
| Quadratic Functions                        | <p>Express quadratic functions in standard, vertex, and intercept form</p> <p>Graph quadratic functions using key features from each form</p> <p>Complete the square to convert from standard to vertex form</p> <p>Solve quadratic equations using factoring and the quadratic formula</p> <p>Calculate and interpret a discriminant</p> <p>Use quadratic modeling to solve real world problems</p> <p>Perform operations with imaginary and complex numbers</p> |
| Midterm Exam                               | Departmental midterm review and exam  |

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| <p>Polynomials</p>                           | <p>Factor polynomials using Algebra 1 factoring rules<br/> Factor polynomials using sum and difference of cube<br/> Divide polynomials using synthetic and long division<br/> Use the Rational Root Theorem to factor higher degree polynomial functions<br/> Solve higher degree polynomial functions<br/> Create equations in standard form from the roots of polynomials<br/> Graph polynomial functions including maximum and minimum points</p> |
| <p>Rational Functions</p>                    | <p>Perform operations on rational expressions<br/> Solve rational equations<br/> Graph rational equations by identifying asymptotes, discontinuities and intercepts</p>  |
| <p>Radical Functions</p>                     | <p>Simplify and perform operations on radical expressions<br/> Solve square and cube root equations<br/> Manipulate expressions with negative and fractional exponents<br/> Solve equations involving negative and fractional exponents</p>  |
| <p>Exponential and Logarithmic Functions</p> | <p>Define logarithms<br/> Evaluate logarithms<br/> Use the properties of logarithms<br/> Use change of base formula<br/> Graph logarithmic functions<br/> Use calculators with logarithms<br/> Solve application problems including interest, growth and decay</p>   |
| <p>Final Exam</p>                            | <p>Departmental review and final exam</p>  |

