

# Algebra II

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## *Syllabus*

### **Primary Textbook**

Carter, John A., Gilbert J. Cuevas, Roger Day, Carol Malloy, Ruth Casey, Berchie Holliday. *Algebra 2*. Columbus, OH: McGraw-Hill, 2012.

All students will be provided with access to the textbook via the internet. Students may check out a copy of the textbook from the library, if they choose. The textbook will be used as a supplement to the lessons presented in class.

### **Technology**

- I recommend that all students have a scientific or a graphing calculator for use in class and at home. These calculators may be a scientific calculator app on a smart phone. They will use scientific calculators throughout the course.
- Students will not be allowed to use a smart phone on any test.
- The teacher will use a TI-84 calculator emulator displayed on a SMART Board in the classroom as an aid to understanding.
- All students should bring a Chrome book to class for use in accessing the on-line text, instructional websites, and SMART Board activities. Chrome books will also be used to collect data for experiments related to the lessons.

### **Course Description**

This course is an extension to Algebra 1. It will develop more advanced algebra concepts for the students. Student learning will rely heavily on collaboration and discussion among students. These collaborations and discussions will take place within small groups and the class as a whole. The teacher will guide these collaborations and discussions.

### **Course Outline**

The course is organized in units. Most of these units correspond to chapters in the primary textbook. However, significant material will be drawn from other sources. The activities and goals for each unit are listed below.

## Unit 1 — Linear Equations and Functions (9 weeks)

### Activities:

- MARS Formative Assessment: Functions and Everyday Situations
- Experiment: Acceleration
- Experiment: Conservation of Momentum
- MARS Formative Assessment: Devising a Measure for Correlation
- MARS Formative Assessment: Solving Linear Equations in Two Variables

### Learning Goals:

- Translate words into algebraic expressions
- Learn to write linear equations
- Understand correlation between data and a linear fit
- Solve systems of linear equations

## Unit 2 — Quadratic Functions (6 weeks)

### Activities:

- Math Open Ref: Quadratic Functions
- Experiment: Falling Ball
- Experiment: Conservation of Energy
- MARS Formative Assessment: Forming Quadratics

### Learning Goals:

- Graph quadratic functions
- Factor Quadratic expressions
- Completing the square
- Quadratic formula
- Complex numbers and quadratic equations

## Unit 3 — Polynomials and Polynomial Functions (3 weeks)

### Activities:

- MARS Formative Assessment: Manipulating Polynomials

### Learning Goals:

- Understand negative exponents
- Manipulate monomials
- Divide polynomials
- Factor polynomials

- Recognize the shape of the graph of a polynomial function
- Find the zeros of a polynomial function
- Solving polynomial equations

## **Unit 4 — Rational Functions (3 weeks)**

### **Activities:**

- Experiment: Lenses and Real Images
- MARS Formative Assessment: Rational and Irrational Numbers I

### **Learning Goals:**

- Graph rational functions
- Solve rational equations

## **Unit 5 — Radical Equations and Rational Exponents (6 weeks)**

### **Activities:**

- MARS Formative Assessment: Manipulating Radicals
- Experiment: Simple Pendulum

### **Learning Goals:**

- Understand the relationship between radicals and rational exponents
- Graph radical functions
- Solve radical equations