

# Algebra II Course Syllabus

## Description:

This course allows students to learn while having fun. Interactive examples help guide students' journey through customized feedback and praise. Mathematical concepts are applied to everyday occurrences such as earthquakes, stadium seating, and purchasing movie tickets. Students investigate the effects of an equation on its graph through the use of technology. Students have opportunities to work with their peers on specific lessons.

Algebra 2 is an advanced course using hands-on activities, applications, group interactions, and the latest technology.

**Estimated Completion Time:** 2 segments / 32-36 weeks

## Major Topics and Concepts:

### Segment I

#### Module 1: Radical and Polynomial Operations

- 01.00 Introduction to Radical and Polynomial Operations
- 01.01 Rational Exponents
- 01.02 Properties of Rational Exponents
- 01.03 Solving Radical Equations
- 01.04 Radical and Polynomial Operations Mid-Module Check
- 01.05 Radical and Polynomial Operations Discussion-Based Assessment
- 01.06 Complex Numbers
- 01.07 Operations on Complex Numbers
- 01.08 Polynomial Operations
- 01.09 Radical and Polynomial Operations Review and Practice Test
- 01.10 Radical and Polynomial Operations Test

#### Module 2: Factoring and Quadratics

- 02.00 Introduction to Factoring and Quadratics
- 02.01 Greatest Common Factors and Special Products
- 02.02 Factoring by Grouping
- 02.03 Sum and Difference of Cubes
- 02.04 Graphing Quadratics
- 02.05 Completing the Square
- 02.06 Solving Quadratic Equations
- 02.07 Solving Quadratic Equations with Complex Solutions
- 02.08 Investigating Quadratics
- 02.09 Factoring and Quadratics Review and Practice Test
- 02.10 Factoring and Quadratics Discussion-Based Assessment
- 02.11 Factoring and Quadratics Test

### **Module 3: Solving Polynomials**

- 03.00 Introduction to Solving Polynomials
- 03.01 Polynomial Long Division
- 03.02 Theorems of Algebra
- 03.03 Polynomial Transformations
- 03.04 Solving and Graphing Polynomials
- 03.05 Polynomial Identities and Proofs
- 03.06 Solving Polynomials Review and Practice Test
- 03.07 Solving Polynomials Discussion-Based Assessment
- 03.08 Solving Polynomials Test

### **Module 4: Rational Equations**

- 04.00 Introduction to Rational Equations
- 04.01 Simplifying Rational Expressions
- 04.02 Discontinuities of Rational Expressions
- 04.03 Asymptotes of Rational Functions
- 04.04 Solving Rational Equations
- 04.05 Rational Equations Quiz
- 04.06 Segment One Honors Project
- 04.07 Segment One Collaboration Component
- 04.08 Segment One Exam Review
- 04.09 Rational Equations Discussion-Based Assessment
- 04.10 Segment One Exam

### **Segment II**

### **Module 5: Exponential and Logarithmic Functions**

- 05.00 Introduction to Exponential and Logarithmic Functions
- 05.01 Exponential Functions
- 05.02 Logarithmic Functions
- 05.03 Exponential and Logarithmic Functions Mid-Module Check
- 05.04 Exponential and Logarithmic Functions Discussion-Based Assessment
- 05.05 Graphing Exponential Functions
- 05.06 Graphing Logarithmic Functions
- 05.07 Exponential and Logarithmic Functions Review and Practice Test
- 05.08 Exponential and Logarithmic Functions Test

### **Module 6: Systems of Equations**

- 06.00 Introduction to Systems of Equations
- 06.01 Solving Systems of Equations Algebraically
- 06.02 Solving Systems of Equations Graphically
- 06.03 Solving Systems of Nonlinear Equations

- 06.04 Graphing Systems of Nonlinear Equations
- 06.05 Systems of Equations Review and Practice Test
- 06.06 Systems of Equations Discussion-Based Assessment
- 06.07 Systems of Equations Test

### **Module 7: Sequences and Series**

- 07.00 Introduction to Sequences and Series
- 07.01 Arithmetic Sequences and Series
- 07.02 Geometric Sequences
- 07.03 Geometric Series
- 07.04 Sigma Notation
- 07.05 Graphing Sequences and Series
- 07.06 Sequences and Series Review and Practice Test
- 07.07 Sequences and Series Discussion-Based Assessment
- 07.08 Sequences and Series Test

### **Module 8: Statistics**

- 08.00 Introduction to Statistics
- 08.01 Events and Outcomes in a Sample Space
- 08.02 Independent Probability
- 08.03 Conditional Probability
- 08.04 Normal Distribution
- 08.05 Models of Populations
- 08.06 Using Surveys
- 08.07 Using Experiments
- 08.08 Statistics Review and Practice Test
- 08.09 Statistics Discussion-Based Assessment
- 08.10 Statistics Test
- 08.11 Segment Two Honors Project

### **Module 9: Trigonometry**

- 09.00 Introduction to Trigonometry
- 09.01 Introduction to the Unit Circle
- 09.02 Unit Circle and the Coordinate Plane
- 09.03 Trigonometric Functions with Periodic Phenomena
- 09.04 Pythagoras, Trigonometry, and Quadrants
- 09.05 Functions of All Types
- 09.06 Trigonometry Quiz
- 09.07 Segment Two Collaboration Component
- 09.08 Segment Two Exam Review
- 09.09 Trigonometry Discussion-Based Assessment
- 09.10 Segment Two Exam

- **10.11 Segment Two Collaboration Component Course Assessment and Participation Requirements:**

To achieve success, students are expected to submit work in each course weekly. Students can learn at their own pace; however, “any pace” still means that students must make progress in the course every week. To measure learning, students complete self-checks, practice lessons, multiple choice questions, projects, discussion-based assessments, and discussions. Students are expected to maintain regular contact with teachers; the minimum requirement is monthly. When teachers, students, and parents work together, students are successful.