Mathematics

Syllabus

Course Description

This course explores advanced algebra concepts, from imaginary and complex numbers to polynomial, rational, radical, exponential, and logarithmic functions. You'll learn how to solve equations, factor expressions, and use properties of operations to simplify and model real-world problems. Graphing skills are built throughout the course, helping you analyze functions, find key features, and understand how transformations change their shapes. By the end, you'll be able to apply these tools to solve challenging problems and explain your reasoning with confidence.

Prerequisites

There are no prerequisites for this course.

Course Materials and Technology

Students may use a handheld graphing or scientific calculator or a Desmos online calculator (found at desmos.com/scientific or desmos.com/calculator only) during the final exam; no other calculator is allowed.

Course Outcomes

As students complete the course assignments, they will increase their knowledge, improve a 21st-century skill, and develop an attribute.

Knowledge

Knowledge: Algebra 2, Part 1

In this course, *knowledge* refers to the subject matter and content students will learn while completing the readings, practices, quizzes, and assignments.

On successful completion of this course, students will be able to do the following:

1. Solve and simplify a wide range of equations – including quadratic, polynomial, rational, radical, exponential, logarithmic, and absolute value equations, with both real and complex solutions.
2. Apply algebraic operations – add, subtract, multiply, divide, and factor expressions involving polynomials, rational expressions, radicals, and complex numbers.
3. Analyze and graph functions – identify key features, transformations, intercepts, zeros, domain, range, intervals of increase/decrease, and end behavior for multiple function types.
4. Use mathematical models to represent and solve real-world problems – apply properties, formulas (like the quadratic formula and geometric series), and factoring techniques to practical scenarios.
5. Communicate mathematical reasoning clearly – explain how components of expressions and functions contribute to the whole, and verify solutions including identifying extraneous answers.

21st-Century Skill: Idea Design and Refinement

As students complete this course's assignments, they will gain skills in idea design and refinement. This skill is part of creativity.

Attribute: Courage

This course focuses on developing the attribute of courage in the context of algebra.

Grading and Assignments

The letter grade in this course will be based on these assignments and exams.

Assignment or Exam	Grading	Percent of Total Grade
Study Guides	Computer-Graded	10%
Written Problems	Teacher-Graded	7.5%
Application Projects	Teacher-Graded	7.5%
Assignments	Computer-Graded	20%

Assignment or Exam	Grading	Percent of Total Grade
Module Quizzes	Computer-Graded	35%
Midcourse Quiz and Final Exam	Computer-Graded	20%

Assignments and Exams

Due Dates

The due dates in the course are only suggestions to help the students pace themselves. You do *not* need to complete assignments, quizzes, and exams by the due date set in the course.

Study Guides

Study guides are provided for each module. They will help students focus on the important concepts needed to be successful in this course and in life. Study guides will be due in each module and points will be awarded upon submission.

Assignments

There are 52 computer-graded assignments in this course, one for each lesson. These assignments consist of a handful of questions that are completed via Derivita, an external math software.

There are also 8 teacher-graded assignments, which help ensure you understand the processes needed to solve various types of problems.

Written Problems

Written Problems give the students opportunities to apply the concepts they have learned. They also evaluate the students' mastery of the Skill for the course. The written problems are only submitted in modules 2, 4, 6, 10, 12, and 14.

Module Practice Quizzes and Module Quizzes

Module Practice Quizzes

At the end of each learning module, there is a practice quiz to help prepare you for the module quiz. These quizzes are not graded and do not impact your overall course grade.

Module Quizzes

In addition to practice quizzes at the end of each module, there will also be a graded quiz. These quizzes are graded and are calculated into your overall course grade. You will be allowed two attempts on each question. Each quiz is open-book and open-note and untimed.

Application Projects

Application projects give the students opportunities to apply the concepts they have learned to real-life situations, scenarios, and events. They also evaluate the students' mastery of the Skill for the course.

Module Quizzes

Quizzes are administered at the end of each module. Each quiz is open-book/note and untimed. They consist entirely of multiple-choice questions and come directly from the lesson material and the videos.

Midcourse Quiz

This computer-graded quiz covers the material up to the midcourse quiz. The questions on the midcourse quiz are similar in format to the questions on the final exam.

Final Exam

The final exam covers all course content.

Course Grade

The letter grade will be calculated according to these percentages.

Percent to Letter Grade Calculation	
A	100%–93%
A–	<93%–90%
B+	<90%–87%
B	<87%–83%
B–	<83%–80%
C+	<80%–77%
C	<77%–73%
C–	<73%–70%
D+	<70%–67%

Percent to Letter Grade Calculation	
D	<67%–63%
D–	<63%–60%
F (fail)	<60%–0%