

# MATHEMATICS CURRICULUM ALGEBRA I/II

The District School Board of Collier County

"Unlocking Each Student's Gift"



*Florida  
Sunshine  
State  
Mathematics  
Standards*

## COURSE DESCRIPTION/ STANDARDS

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# **COURSE DESCRIPTION**

## **Algebra II Honors**

**Florida Department of Education**

**COURSE DESCRIPTION - GRADES 9-12, ADULT**

**Subject Area:** Mathematics  
**Course Number:** 1200340  
**Course Title:** Algebra II Honors  
**Credit:** 1.0

**Will meet graduation requirements for Mathematics**

**Basic Assumptions for Mathematics Education:**

- \* All students have access to calculators and computers.
- \* Classroom activities are student -centered, emphasizing concrete experiences and active/experiential learning.
- \* All courses have increased emphasis on problem solving, estimation, and real-world applications.
- \* Evaluation includes alternative methods of assessment.
- \* All strands addressed in the Sunshine State Standards are developed across the PreK-12 Curriculum.

**A. Major Concepts/Content.** The purpose of this course is to continue the study of algebra and to provide the foundation for applying algebraic skills to other mathematical and scientific fields. The course covers the algebraic concepts of Algebra II, but in greater depth. Students in Algebra II Honors are exposed to more challenging problems which involve higher critical thinking skills. Students are exposed to elementary algebraic theory and proofs. Technology, including the graphing calculator, is used to explore algebraic problems and graphs in greater depth. The algebra content includes, but is not be limited to, the following:

- \* structure and properties of the complex number system
- \* arithmetic and geometric sequences and series
- \* relations, functions and graphs extended to polynomial, exponential, and logarithmic functions
- \* varied solution strategies for linear equations, inequalities, and systems of equations and inequalities
- \* varied solutions strategies, including the quadratic formula, for quadratic equations
- \* conic sections and their applications
- \* data analysis, including measures of central tendency and dispersion
- \* probability, permutations, and combinations

This course shall integrate the Goal 3 Student Performance Standards of the Florida Systems of School Improvement and Accountability as appropriate to the content and processes of the subject matter.

**B. Special Note.** Student earning credit in Algebra II may not earn credit in Algebra II Honors.

- C. **Course Requirements.** These requirements include the benchmarks from the Sunshine State Standards that are most relevant to this course. The benchmarks printed in regular type are required for this course.

**After successfully completing this course, the student will:**

1. **Demonstrate understanding of the different ways numbers are represented and used in the real world.**
  - MA.A.1.4.1 associate verbal names, written word names, and standard numerals with integers, rational numbers, irrational numbers, real numbers, and complex numbers.
  - MA.A.1.4.2 understand the relative size of integers, rational numbers, irrational numbers, and real numbers.
  - MA.A.1.4.3 understand concrete and symbolic representations of real and complex numbers in real-world situations.
  - MA.A.1.4.4 understand that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, scientific notation, exponents, radicals, absolute value, and logarithms.
2. **Demonstrate understanding of number systems.**
  - MA.A.2.4.1 understand *and use* the basic concepts of limits and infinity.
  - MA.A.2.4.2 understand and use the real number system.
  - MA.A.2.4.3 understand the structure of the complex number system.
3. **Demonstrate understanding of the effects of operations on numbers and the relationships among these operations, select appropriate operations, and compute for problems solving.**
  - MA.A.3.4.1 understanding and explain the effects of addition, subtraction, multiplication, and division on real numbers, including square roots, exponents, and appropriate inverse relationships.
  - MA.A.3.4.2 select and justify alternative strategies, such as using properties of numbers, including inverse, identity, distributive, associative, and transitive, that allow operational shortcuts for computational procedures in real-world or mathematical problems.
  - MA.A.3.4.3 add, subtract, multiply, and divide real numbers, including square roots and exponents, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.
4. **Use estimation in problem solving and computation.**
  - MA.A.4.4.1 use estimation strategies in complex situations to predict results and to check the reasonableness of results.

- 5. Demonstrate understanding and apply theories related to numbers.**
  - MA.A.5.4.1 apply special number relationships such as sequences and series to real-world problems.
  
- 6. Measure quantities in the real world and use the measures to solve problems.**
  - MA.B.1.4.2 use concrete and graphic models to derive formulas for finding rate, distance, time, angle measures, and arc length.
  
- 7. Compare, contrast, and convert within systems of measurement (both standard/nonstandard and metric/customary).**
  - MA.B.2.4.1 select and use direct (measured) and indirect (not measured) methods of measurement as appropriate.
  
  - MA.B.2.4.2 solve real-world problems involving rated measures (miles per hour, feet per second).
  
- 8. Visualize and illustrate ways in which shapes can be combined, subdivided, and changed.**
  - MA.C.2.4.1 understand geometric concepts such as perpendicularity, parallelism, tangency, congruency, similarity, reflections, symmetry, and transformations including flips, slides, turns, enlargements, rotations, and fractals.
  
  - MA.C.2.4.2 analyze and apply geometric relationships involving planar cross-sections (the intersection of a plane and a three-dimensional figure).
  
- 9. Use coordinate geometry to locate objects in two and three dimensions and to describe objects algebraically.**
  - MA.C.3.4.1 represent and apply geometric properties and relationships to solve real-world and mathematical problems including ratio, proportion, and properties of right triangle trigonometry.
  
  - MA.C.3.4.2 using a rectangular coordinate (graph), apply and algebraically verify properties of two and three-dimensional figures, including distance, midpoint, slope, parallelism, and perpendicularity.
  
- 10. Describe, analyze, and generalize a wide variety of pattern, relations, and functions.**
  - MA.D.1.4.1 describe, analyze, and generalize relationships, patterns, and functions using words, symbols, variables, tables, and graphs.
  
  - MA.D.1.4.2 determine the impact when changing parameters of given functions.

- 11. Use expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.**
- MA.D.2.4.1 represent real-world problem situations using finite graphs, matrices, sequences, series, and recursive relations.
  - MA.D.2.4.2 use systems of equations and inequalities to solve real-world problems graphically, algebraically, and with matrices.
- 12. Demonstrate understanding and use the tools of data analysis for managing information.**
- MA.E.1.4.1 interpret data that has been collected, organized, and displayed in charts, tables, and plots.
  - MA.E.1.4.2 calculate measures of central tendency (mean, median, and mode) and dispersion (range) for complex sets of data and determined the most meaningful measure to describe the data.
  - MA.E.1.4.3 analyze real-world data and make predictions of larger populations by applying formulas to calculate measures of central tendency and dispersion using the sample population data and using appropriate technology, including calculators and computers.
- 13. Identify patterns and make predictions from an orderly display of data using concepts of probability and statistics.**
- MA.E.2.4.1 determine probabilities using counting procedures, tables, tree diagrams and formulas for permutations and combinations.
  - MA.E.2.4.2 determine the probability for simple and compound events as well as independent and dependent events.