FAME Public Charter School A-G Course Template

Course Title: a-g Algebra II
Prerequisite: Algebra 1 or Geometry with a C or better

Brief Course Description - Briefly (in a short paragraph) describe the course focusing on content. This should look like something you would see in a course catalog. Type the information in the text box below. All text boxes will expand as needed.

This is a course that expands on the basic algebraic concepts involved in solving equations and inequalities, factoring polynomials, graphs, exponents, and solving quadratic equations. In addition, it examines quadratic, logarithmic, and exponential functions, the application of functions to real world problems, conic sections, probability, trigonometric functions, and complex numbers.

Textbooks
Include list of Primary and Secondary Texts. Make sure to note the books that will be read entirely and those that will be as excerpts. Textbook information is not necessary if your course is a Visual and Performing Arts course. Online texts or non-standard text materials should include a link to the online text.

Primary Textbooks
Title: Algebra 2 (California Edition)
ISBN: 0618811818
Edition:
Publication Date: 2007
Publisher: McDougal Littell
Author(s): Larson, Boswell, Kanold, Stiff
URL Resource(s):
or
Title: Algebra 2
ISBN: 013365947X
Edition:
Publication Date:
Publisher: Prentice Hall
Author(s):
URL Resource(s):
or
Title: Algebra 2
ISBN: 007873830X
Edition:
Publication Date:
Publisher: Glencoe McGraw Hill
Author(s):
URL Resource(s):

Supplemental Instructional Materials - Please describe. If using online text or non-standard material, please provide the title of the material or webpage and the URL link.

Teacher's Edition McDougal Littell Ca version ISBN: 9780618811823
Teacher's Edition Prentice Hall ISBN: 01335659496
Teacher's Edition Glencoe McGraw Hill ISBN: 0078738326

Additional a-g Approved Course Options
NUVHS Algebra II A/B

Course Objectives – what the students will know at the end of the course

After completing this course, students will have expanded their ability to solve equations and inequalities, factoring polynomials, graphs, and exponents, and solving quadratic equations. Students will further develop the ability to perform quadratic, logarithmic, and exponential functions. Finally, students will understand the real-world applications of algebra and its concepts.

Course Goals and Major Student Outcomes – what the students will be able to do at the end of the course

Coursework will include a thorough understanding and application of the following topics:

- Students solve equations and inequalities involving absolute value
- Students solve systems of linear equations and inequalities (in two or three variables) simultaneously, by substitution, graphically, or with matrices.
- Students are adept at operations on polynomials, including long division.
- Students factor polynomials representing the difference of squares, perfect square trinomials, and the sum and difference of two cubes.
- Students demonstrate knowledge of how real and complex numbers are related both arithmetically and graphically and can plot complex numbers as points in the plane.
- Students add, subtract, multiply, and divide complex numbers.
- Students add, subtract, multiply, and divide reduce and evaluate rational expressions with monomial and polynomial denominators, and simplify complicated fractions including fractions with negative exponents in the complex number system.
- Students demonstrate and explain the effect changing a coefficient has on the graph of quadratic functions.
- Students graph quadratic functions and determine the maxima, minima, and zeros of the function
- Students prove simple logarithms including understanding the inverse relationship between exponents and logarithms, and judging the validity of an argument based on whether the properties of real numbers, exponents, and logarithms have been applied correctly at each step.
- Students know the laws of exponents, understand exponential functions, and use these functions in problems involving exponential growth and decay.
- Students use the definition of logarithms and the product formula for logs to translate between logarithms in any bases.
- Students understand and use the properties of logarithms to simplify logarithmic numeric expressions and identify their approximate values.
- Students determine if a specific algebraic statement involving rational expressions, radical expressions, logarithmic or exponential functions, is sometimes true, always true, or never true.
- Students demonstrate and explain how geometry of the graph of a conic section depends on the coefficients of the quadratic equation representing it.
- Given a quadratic equation, students can use the method of completing the square to put

the equation into standard form and can recognize whether its graph is a circle, ellipse, parabola, or hyperbola. Students can then graph the equation.

- Students use fundamental counting principles to compute combinations and permutations.
- Students use combinations and permutations to compute probabilities.
- Students know the Binomial Theorem and use it to expand binomial expressions that are raised to positive integer powers.
- Students apply the method of mathematical induction to prove general statements about the positive integers.
- Students find the general term and the sums of arithmetic series and both finite and infinite geometric series.
- Students solve problems involving functional concepts such as composition, inverse, and arithmetic operations on functions.
- Students use properties from number systems to justify steps in combining and simplifying functions.

Course Outline by Units of Study – the content you will cover arranged in units

- Linear Equations and Inequalities:
  - Absolute value
  - Two or three variables, solved
  - Word problems: equations and inequalities in two and three variables and two linear equations in two variables.
- Polynomials:
  - All operations, including long division
  - Difference of squares, perfect square trinomials
  - Sum and difference of two cubes
  - Polynomial denominators, including those with negative exponents
- Quadratic Equations:
  - Solve by factoring, completing the square, or using the quadratic formula
  - Quadratic equations in the complex number system
  - Graphing: determining the maxima, minima, and zeros of the function
  - Effects of changing coefficients in a quadratic equation
  - Recognize and graph equations of circle, ellipse, parabola, or hyperbola
  - Word problems
- Complex Numbers
  - Relationship between real and complex numbers, arithmetically & graphically
  - Plotting as points in a plane
- Logarithms:
  - Prove simple laws of logarithms
  - Simplify logarithmic numeric expressions and identify their approximate values.
- Conic Functions

- Probability:
    - Combinations and permutations
    - Finite and infinite geometric series
- Word Problems:

Rate Problems, work problems, percent mixture problems.

Key Assignments

- Unit by Unit problem sets
- End of Chapter tests
- Finals required at mid-term and end of year

Instructional Methods and Strategies

Instruction may include the following:

- Lecture/Demonstration
- Discussion
- Text Reading and Practices
- Personal Tutoring
- CD Rom
- Internet Research

Assessment Methods and Strategies

Assessment tools include the following, but are not limited to:

- Monthly review of student work by the Independent Study Teacher.
- Chapter and Unit tests and examinations.
- Student grades on text practices and standardized tests
- Written state examinations
- Oral communication with Independent Study Teacher.
- Final Examination.