

## COURSE PROFICIENCY OUTLINE

### ALGEBRA II – 1305

Honors

5 Credits

#### Purpose

This course which contains little review of the basic concepts of Algebra I is designed for the above average college-prep student who has shown marked proficiency in previous math courses. It differs from Algebra II in that the concepts from Algebra are integrated with trigonometry and work with the trigonometric functions.

Algebra is the language through which most of mathematics is communicated, and therefore, is a fundamental lifetime skill. Students should learn to use the calculator as a tool for processing data and performing calculations to investigate and solve problems where appropriate. Algebra II extends the fundamental concepts and skills of elementary algebra to higher level and, while introducing new concepts, draws upon the same basic notions previously studied.

#### I. Content Clusters 4.1, 4.3, 4.5

- A. Equations/Inequalities
- B. Number Systems
- C. Language of Algebra
- D. Algebraic Expressions
- E. Relations, Functions and Graphing

#### II. Student Outcomes 4.1, 4.3, 4.5

- A. Equations/Inequalities  
Students will be able to:
  - 1. Understand the process of solving equations and inequalities with one variable and, where appropriate, represent solutions graphically.
  - 2. Understand the process of solving quadratic equations.
  - 3. Understand the process of solving systems of equations in two variables.
  - 4. Understand the process of solving systems of linear inequalities in two variables by graphing.
  - 5. Understand the process of solving piecewise functions by graphing and be able to evaluate given a domain.
  - 6. Understand the process of solving absolute value equations and inequalities.
  - 7. Apply the process of solving problems using equations and inequalities.
- B. Number Systems  
Students will be able to:
  - 1. Understand and apply the field properties of the complex numbers, including operations with complex numbers.
  - 2. Represent, order, and use numbers in a variety of equivalent forms (fractions, decimals, percent, exponential/scientific notation, radical, rational exponents, calculator display).
- C. Language of Algebra  
Students will be able to:
  - 1. Understand the concept and use of variables.
  - 2. Understand and use mathematical vocabulary and symbolic notation to represent and communicate ideas.
  - 3. Formulate, simplify, and evaluate algebraic expressions.

- D. Algebraic Expressions  
Students will be able to:
1. Perform operations and simplify polynomial, rational, and radical expressions and expressions with rational exponents.
  2. Factor polynomial expressions
  3. Use algebraic expressions to represent real-world situations.

- E. Relations, Functions, and Graphing  
Students will be able to:
1. Understand and apply the concept of finite and infinite relations and functions (including domain and range).
  2. Represent and analyze the relationship among a table of values and algebraic formula, a written statement, and a graph, including the line, the parabola, and the circle.
  3. Understand operations on, and the general properties and behavior of functions, including the basic concepts of exponential and logarithmic functions.
  4. Apply the concepts and skills of coordinate geometry, such as midpoint, distance and slope.
  5. Construct, interpret, and/or inferences from graphs, tables and charts that reflect data from real-world situations (to include evaluating arguments of other persons).
  6. Represent and analyze the relationship among a table of values, trigonometric functions and the graph developed from the unit circle.
  7. Understand operations on, and the general properties and behavior of the trigonometric functions and their inverses.

## II. Materials

- A. Text: McDougal, Littell & Co., Algebra 2
- B. Notebook and pencils must be provided by the student.
- C. Calculators will be provided when necessary.

## III. Evaluation

- A. The student will be expected to complete classwork, homework, keep a notebook and take tests and quizzes. These will be checked and reviewed by the teacher.
- B. The student will be expected to demonstrate an acceptable level of proficiency in the objectives and content of this course.
- C. The student will be expected to demonstrate at all times appropriate classroom behavior such as self-control, respect for others, respect for property and a mature attitude.
- D. The student will be expected to adhere to the school rules and regulations for behavior and the district policy for attendance.
- E. Students will be required to successfully pass the High School Proficiency Assessment as mandated in the graduation law (N.J.S.A. 6:8-4.2).
- F. Students who fail the HSPA examination will be placed in a Basic Skills Math class as required by N.J.S.A. 6:8-4.2. There will be no exceptions to this requirement.
- G. The student will be expected to take a comprehensive final exam covering the entire school year's work. This exam will count at 1/5 of the final grade.
- H. The final grade represents the teacher's professional judgment of the student's performance and all of the aforementioned activities and/or requirements are included in the evaluative process.