

Course Title: Algebra II

Textbook(s) & reference materials:

Algebra 2 Prentice Hall for PA copyright 2011,
Scientific Calculators

Course Description:

Students are reintroduced to the algebraic properties of the real number system, to equations and to inequalities of the first and second degree. Polynomial, radical, rational, logarithmic, and exponential functions will also be explored. Matrices and determinants are introduced to aid in the solution of systems of equations in two and three variables. Much emphasis is placed on factoring and operations with algebraic fractions. Topics of relations and functions are studied. Probability and statistics is incorporated using real world data. The emphasis in this course is on the application and explanation of algebraic concepts and how they relate to real world situations.

Course Content:

Algebra I Review

- Properties of Real Numbers
- Algebraic Expressions
- Solving Equations
- Solving Inequalities

Functions, Equations, and Graphs

- Relations and Functions
- Linear Equations
- Direct Variation
- Using Linear Models
- Absolute Values Functions and Graphs
- Vertical and Horizontal Translations

Word Problems

- Rectangles, Triangles, Squares
- Distance
- Coin
- Consecutive Integers
- Age

Linear Systems

- Graphing Systems of Equations
- Solving Systems Using the Graphing Calculator
- Solving Systems Algebraically (Substitution, Elimination)
- Systems of Inequalities
- Systems of Equations Word Problems
- Systems with Three Variables
- Systems of Three Variables Word Problems

Matrices

- Organizing Data Into Matrices
- Adding and Subtracting Matrices
- 2X2 Matrices, Determinants, and Inverses
- 2X2 Matrices, Determinants, and Inverses
- 3X3 Matrices, Determinants, and Inverses
- Inverse Matrices and Systems
- Cramer's Rule

Quadratic Equations and Functions

- Quadratic Functions
- Properties of Parabolas
- Finding zeros, max, and min using Graphing Calculator
- Translating Parabolas
- Factoring GCF
- Factoring Difference of Perfect Squares
- Coefficients > 1
- Factor by Grouping
- Sum and Difference of cubes
- Factoring using multiple rules Quadratic Functions
- Simplifying Radicals Quadratic Equations
- Complex Numbers
- Completing the Square
- Quadratic Formula

Polynomial Functions

- Properties
- Polynomials and Linear Factors
- Dividing Polynomials
 - Long Division
 - Synthetic Division
- Solving Polynomial Equations

Probability

- Independent Events
- And/Or
- With and Without Replacement
- Permutations and Combinations
- Fundamental Counting Principal

Statistics

- Mean, Median, Mode
- Standard Deviation
- Stem & Leaf Plots
- Box & Whisker Plot
- Pie Chart
- Histogram
- Samples and Surveys

Radical Functions and Rational Exponents

- Roots and Radical Expressions
- Multiplying and Dividing Radical Expressions
- Binomial Radical Expressions
- Rational Exponents
- Solving Radical Equations
- Function Operations

- Inverse and Functions
- Inverse Relations and Functions
- Graphing Radical Functions

Rational Functions

- Inverse Variation
- Rational Functions and Their Graphs
- Adding and Subtracting Rational Expressions
- Solving Rational Equations

Exponential and Logarithmic Functions

- Exploring Exponential Models
- Properties of Exponential Functions
- Logarithmic Functions
- Properties of Logarithms
- Exponential and Logarithmic Equations
- Natural Logarithms

Course Requirements:

Each student is required to complete all tests, projects and assignments. Failure to do so will affect the student's overall grade.

Grade Components/Assessments:

Grades will be based on a point system that will be converted to overall percentages. The following methods will be used, for the year, to assess and evaluate student performance.

Tests: 40 % - 50 %

Quizzes: 25 % - 35 %

Homework: 15 % - 20%

Alternative Assessment: 10 % - 15 %

Additional alternative assessments are often included in one of the other three categories above.

Based on our mission of giving every student a chance to reach his/her fullest potential, students will be allowed to make up work missed due to excused absences as stated in the student handbook and are encouraged to get additional help whenever necessary for better understanding of class concepts.

Pathway:

This course is appropriate for students pursuing a traditional academic pathway in any of the career clusters. The course meets required state standards. It is most appropriate for students planning to go to a four-year college.