Algebra I – Credit Recovery

COURSE DESCRIPTION: The purpose of this course is to allow the student to gain mastery in working with and evaluating mathematical expressions, equations, graphs, and other topics, with an emphasis on real-world applications throughout this year-long algebra course. The first semester of the course includes an introduction to real numbers and variable expressions, methods for solving equations, understanding functions and relations, and an in-depth study of linear and quadratic functions. The second semester of the course provides students with extensive instruction in topics including systems of equations and inequalities, exponential and radical functions, rational expressions and equations, as well as probability and statistics. Throughout the course are self-check quizzes, audio tutorials, interactive manipulatives, practice games, and plenty of review activities.

COURSE OBJECTIVES:

- Describe how mathematical properties are used to simplify numeric and variable expressions
- Solve one- and multi-step equations
- Solve equations involving absolute values
- Analyze relations and functions represented in a variety of forms
- Interpret functions based on real world situations
- Write and solve linear equations
- Graph lines written in different forms
- Define properties of polynomials and quadratic functions
- Demonstrate methods for factoring polynomials
- Solve quadratic equations
- Solve systems of linear equations by graphing and algebraically
- Graph systems of linear inequalities and interpret the solution set
- Simplify expressions with exponents, including scientific notation
- Graph and analyze exponential and radical functions
- Solve exponential and radical equations
- Simplify rational expressions
- Write and solve rational equations
- Calculate theoretical probability
- Use statistical methods for analyzing and organizing data
- Solve problems involving ratios, rates, and unit conversion

PREREQUISITES: None

COURSE LENGTH: Two Semesters

REQUIRED TEXT: No required textbook for this course

MATERIALS LIST: No required materials for this course

COURSE OUTLINE:

Module I: Numbers and Expressions

- Lesson 1 – Real Numbers
- Lesson 2 – Rational Numbers

- Lesson 3 – Fractions, Decimals, and Percents
- Lesson 4 – The Number Line
- Lesson 5 – Exponents
- Lesson 6 – Roots
- Lesson 7 – Order of Operations
- Lesson 8 – Number Properties
- Lesson 9 – Commutative and Associative Properties
- Lesson 10 – Distributive Property

Module II: Solving Equations

- Lesson 1 – Algebraic Expressions
- Lesson 2 – Verbal Statements
- Lesson 3 – One-Step Equations
- Lesson 4 – Multi-Step Equations
- Lesson 5 – Absolute Value
- Lesson 6 – Absolute Value Equations
- Lesson 7 – Complex Multi-Step Equations

Module III: Functions and Relations

- Lesson 1 – Coordinate Plane
- Lesson 2 – Relations and Functions
- Lesson 3 – Function Notation and Rules
- Lesson 4 – Evaluating Functions
- Lesson 5 – Domain and Range
- Lesson 6 – Graph of a Function
- Lesson 7 – Function Operations
- Lesson 8 – Inverse Functions

Module IV: Linear Equations

- Lesson 1 – Slope
- Lesson 2 – Rate of Change
- Lesson 3 – Direct Variation
- Lesson 4 – Linear Functions
- Lesson 5 – Converting Between Forms
- Lesson 6 – Writing the Equation of a Line
- Lesson 7 – Graphing Linear Functions
- Lesson 8 – Line of Best Fit
- Lesson 9 – Vertical and Horizontal Lines
- Lesson 10 – Parallel and Perpendicular Lines

Module V: Polynomials and Quadratics

- Lesson 1 – Adding and Subtracting Polynomials
- Lesson 2 – Multiplying Polynomials
- Lesson 3 – GCF of Polynomials

- Lesson 4 – Guess and Check Factoring
- Lesson 5 – Factoring Special Cases
- Lesson 6 – Solving Quadratic Equations
- Lesson 7 – Completing the Square
- Lesson 8 – Quadratic Formula
- Lesson 9 – Quadratic Graphs
- Lesson 10 – Maximum and Minimum

Module VI: Inequalities and Systems

- Lesson 1 – One-Step Inequalities
- Lesson 2 – Multi-Step Inequalities
- Lesson 3 – Compound Inequalities
- Lesson 4 – Absolute Value Inequalities
- Lesson 5 – Graphing Linear Inequalities
- Lesson 6 – Solving Systems by Graphing
- Lesson 7 – Solving Systems by Substitution
- Lesson 8 – Solving Systems by Elimination
- Lesson 9 – Systems of Linear Inequalities
- Lesson 10 – Linear Programming

Module VII: Exponential and Radical Functions

- Lesson 1 – Properties of Exponents
- Lesson 2 – Scientific Notation
- Lesson 3 – Exponential Functions
- Lesson 4 – Solving Exponential Functions
- Lesson 5 – Exponential Growth and Decay
- Lesson 6 – Simplifying Radical Expressions
- Lesson 7 – Rational Exponents
- Lesson 8 – Distance and Midpoint
- Lesson 9 – Pythagorean Theorem
- Lesson 10 – Radical Equations
- Lesson 11 – Square Root Function

Module VIII: Rational Expressions and Equations

- Lesson 1 – Simplifying Rational Expressions
- Lesson 2 – Multiplying and Dividing Rational Expressions
- Lesson 3 – Adding and Subtracting Rational Expressions
- Lesson 4 – Solving Rational Equations
- Lesson 5 – Characteristics of Rational Functions
- Lesson 6 – Graphing a Rational Function

Module IX: Probability, Statistics, and Discrete Math

- Lesson 1 – Probability
- Lesson 2 – Counting and Permutations

- Lesson 3 – Measures of Central Tendency
- Lesson 4 – Histograms
- Lesson 5 – Box Plots
- Lesson 6 – Matrices
- Lesson 7 – Rates and Ratios
- Lesson 8 – Unit Conversions
- Lesson 9 – Sequences

Module X: Review

- Review 1 – Numbers and Expressions
- Review 2 – Solving Equations
- Review 3 – Function and Relations
- Review 4 – Linear Functions
- Review 5 – Polynomials and Quadratics
- Review 6 – Inequalities and Systems
- Review 7 – Exponential and Radical Functions
- Review 8 – Rational Expressions and Equations
- Review 9 – Probability, Statistics, and Discrete Math

CREDITS: High School Credits