East Penn School District
Secondary Curriculum

A Planned Course Statement
For
Algebra 1 Honors

Course # **7330** Grade(s) 7 - 8

Department: Mathematics

Length of Period (mins.) 41 Total Clock Hours: 123

Periods per Cycle: 6 Length of Course (yrs.) 1

Type of Offering: √ required _____ elective

Credit: 1

Adopted: 6/28/10

Developed by:
Michael Duarte
Chris Kollar
Brian Legutko
Stacey Meckes

Revised: 1/25/2010

Description of Course #306

Course Title: Algebra I Honors

Description: The content of this course includes real numbers, solving equations, and inequalities, proofs, linear graphs, systems of linear equations, exponents, factoring, systems of equations equations, relations, functions, and radical expressions and equations.

Goals:

- To introduce students to the fundamental concepts of Algebra necessary to continue further studies in higher mathematics.

Requirements:

- Scientific Calculator
- Prerequisite: Pre-Algebra B or Pre-Algebra

Text:

Charles, R. I., Hall, B., Kennedy, & Hall, B. (2011). *Prentice Hall Algebra 1.* Boston, MA: Pearson.

Key to Levels of Achievement (Listed with each learning objective)

Awareness (A):	Students are introduced to concepts, forms, and patterns.
Learning (L):	Students are involved in a sequence of steps and practice activities which involved further development and allow evaluation of process.
Understanding (U):	Students demonstrate ability to apply acquired concepts and skills to individual assignments and projects on an independent level.
Reinforcement (R):	Students maintain and broaden understanding of concepts and skills to accomplish tasks at a greater level of sophistication.

Unit	Num	Objective	Level	Content	Evaluation	Standard
I. Introduction to Algebra (REVIEW)	1	Students will write and evaluate algebraic expressions using the properties of numbers in algebra.	R	• Identify, describe and explain patterns • Substitute and simplify algebraic expressions • Determine the appropriate order for simplifying an expression and explain why the order works (order of operations) • Use commutative, associative, identity and distributive properties to simplify expressions • Evaluate expressions, equations, and formulas using the four basic operations, operations of powers and roots, reciprocals, opposites, and absolute values • Translate words into algebraic expressions and equations	• Homework • Tests • Quizzes • Independent Work • Group Work	2.1.8.B 2.1.11.A 2.2.8.A 2.3.8.B 2.5.11.C 2.8.8.C 13.3.11.B 13.3.11.E M11.A.1.1.1 M11.A.1.3.2 M11.A.3.1.1
II. Real Numbers	2	Students will identify number sets. Students will compare, order and evaluate numbers within those sets. Students will identify patterns in sets of real numbers.	R	• Identify, describe and explain patterns • Distinguish between rational and irrational numbers. • Recognize and define the number sets – real, rational, irrational, integers, and whole numbers • Compare real numbers using $<$, $\leq$, $\geq$, $>$ or $\neq$ • Find absolute value, square root, opposites, and reciprocals • *P*erform arithmetic with positive and negative numbers	• Homework • Tests • Quizzes • Independent Work • Group Work	2.1.8.A 2.1.8.B 2.1.8.C 2.1.8.F 2.1.11.A 2.2.8.B 2.2.8.C 2.4.8.A 2.5.11.C 2.8.8.A 2.8.11.A 2.11.8.C 13.3.11.B 13.3.11.E M11.A.1.1.1 M11.A.1.3.2 M11.A.3.1.1

Unit	Num	Objective	Level	Content	Evaluation	Standard
III. Solving Equations	3	Students will write and solve equations, using the properties of equality.	U	• Describe the relationship between an equation and its solution • Use addition, subtraction, multiplication and division equality properties to solve one-step equations • Solve two-step equations using deductive reasoning (justify steps using properties of equality) • Solve multi-step equations using deductive reasoning (justify steps using properties of equality) • Solve equations with variables on both sides of equal sign using deductive reasoning (justify steps using properties of equality) • Translate real world scenarios into algebraic equations and solve • Solve problems using ratios and proportions • Find unions & intersections of sets	• Homework • Tests • Quizzes • Independent Work • Group Work	2.1.8.G 2.1.11.A 2.2.8.A 2.4.8.C 2.4.11.A 2.5.8.C 2.5.11.A 2.5.11.C 2.8.8.B 2.8.8.C 2.8.8.E 2.8.8.J 2.8.11.A 2.8.11.D 2.8.11.N 2.8.11.O 13.3.11.B 13.3.11.E M11.A.2.1.1 M11.A.2.1.2 M11.A.2.1.3 M11.D.2.1.3
IV. Proof Unit	4	Students will fill in reasons for and construct algebraic proofs.	L	• Identify axioms of rational numbers • Identify the properties of equality • Prove number properties • Construct and algebraic proof	• Homework • Tests • Quizzes • Independent work • Group work	2.4.A1.B 2.5.A1.A 2.5.A1.B
V. Functions	5	Students will recognize, represent and describe functions.	U	• Identify and represent patterns that describe linear and nonlinear functions • Graph equations that represent functions • Write equations that represent functions • Identify functions and determine the domain and range	• Homework • Tests • Quizzes • Independent work • Group work	2.5.A1.B 2.8.A1.D 2.8.A2.D

Unit	Num	Objective	Level	Content	Evaluation	Standard
VI. Inequalities	6	Students will write one-variable inequalities, graph one-variable inequalities and solve one-variable inequalities, using the properties of equality.	U	• Describe and graph solutions of an inequalities • Use addition, subtraction, multiplication and division properties to solve one-step inequalities • Solve two-step inequalities using deductive reasoning (justify steps using properties of equality) • Solve multi-step inequalities using deductive reasoning (justify steps using properties of equality) • Solve inequalities with variables on both sides of inequality signs using deductive reasoning (justify steps using properties of equality) • Apply inequalities to real world scenarios • Solve compound inequalities and graph solution sets on number lines • Absolute value inequalities	• Homework • Tests • Quizzes • Independent Work • Group Work	2.1.8.F 2.1.11.A 2.4.11.A 2.5.8.C 2.5.11.C 2.8.8.C 2.8.8.E 2.8.11.D 13.3.11.B 13.3.11.E 3.7.10.A 3.7.10.B M11.D.2.1.1

Unit	Num	Objective	Level	Content	Evaluation	Standard
VII. Graph of Linear Equations in Two-Variables	7	Students will graph linear equations in two-variables. Students will write the equation of a line.	U	• Determine whether a relationship is a function based on its description or graph • Find the domain and range of a function • Determine whether a point is a solution to an equation • Identify points that are solutions to an equation using a graph • Graph a linear equation using a t-chart, slope-intercept form, point-slope form, and standard form • Graph horizontal and vertical lines • Find the slope of a line (given two points, given an equation) • Describe slope (positive, negative, zero, undefined) • Determine if lines are parallel, perpendicular, or neither using slope • Find the slope and y-intercept of a linear equation • Write a linear equation given slope and one point, given a graph, and given two points • Describe the correlation between variables for graphs (including scatter plots) • Find an equation of a line of best fit that models given data; use the model to make estimates • Solve problems using linear models including rate of change • Apply linear equations to real world scenarios • Graph equations with absolute values	• Homework • Tests • Quizzes • Independent Work • Group Work	2.1.11.A 2.2.11.C 2.4.11.E 2.5.8.C 2.5.11.A 2.5.11.B 2.5.11.C 2.6.8.C 2.8.8.G 2.8.8.H 2.8.11.A 2.8.11.D 2.8.11.J 13.3.11.B 13.3.11.E 3.7.10.A 3.7.10.B M11.C.3.1.2 M11.D.2.1.2 M11.D.3.2.1 M11.D.3.2.2 M11.E.4.2.1

Unit	Num	Objective	Level	Content	Evaluation	Standard
VIII. Systems of Equations and Inequalities	8	Students will solve systems of linear equations. Students will graph inequalities with two-variables. Student will generate solutions for a system of linear inequalities using graphing.	U	• Determine whether an ordered pair is a solution of a system of equations • Write and solve a system of two equations using graphing, substitution, and/or elimination • Determine whether a system of equations has one, many or no solutions (classify as Consistent Dependent, Consistent Independent, or Inconsistent) • Solve real world scenarios using linear system models • Graph an inequality in slope-intercept form • Determine whether an ordered pair is a solution of the inequality • Match a given inequality and its graph • Graph two inequalities on the coordinate plane and shade the solutions of the system. • Interpret solutions of systems in the context of the problems • Write the linear inequality that describes the graph	• Homework • Tests • Quizzes • Independent Work • Group Work	2.1.11.A 2.2.8.A 2.2.11.A 2.4.11.E 2.5.8.C 2.5.8.D 2.5.11.A 2.5.11.C 2.8.8.C 2.8.11.D 2.8.11.F 2.8.11.G 2.8.11.J 2.8.11.K 2.8.11.L 2.8.11.M 2.8.11.N 13.3.11.B 13.3.11.E 3.7.10.A 3.7.10.B M11.D.2.1.2 M11.D.2.1.4
IX. Rules of Exponents	9	Students will use the rules of exponents to simplify expressions.	U	• Multiply and divide numbers and variables in exponential form • Simplify negative and zero exponents • Find the power of a power and the power of a product of a product or a quotient • Write numbers using scientific notation	• Homework • Tests • Quizzes • Independent Work • Group Work	2.1.8.A 2.1.8.B 2.1.11.A 2.5.8.C 2.5.11.C 2.8.8.B 13.3.11.B 13.3.11.E M11.A.1.1.2 M11.A.2.2.1 M11.A.2.2.2

Unit	Num	Objective	Level	Content	Evaluation	Standard
X. Operations of Polynomials	10	Students will add, subtract, and multiply polynomials.	U	• Recognize and provide examples of polynomials • Determine whether polynomials in different forms are equivalent • Write polynomials in descending order • Simplify a polynomial by collecting like terms • Classify polynomials by terms and degree • Add and subtract polynomials • Multiply polynomials: FOIL, expansion box, distribution, vertical • Use patterns to determine rules for special products	• Homework • Tests • Quizzes • Independent Work • Group Work	2.1.8.E 2.1.11.A 2.2.8.A 2.5.8.C 2.5.11.C 13.3.11.B 13.3.11.E M11.A.1.2.1 M11.D.2.2.1
XI. Factoring Polynomials	11	Students will use general strategies to factor polynomials. Students will solve polynomial equations by factoring.	U	• Factor expressions to create equivalent polynomial forms • Factor a polynomial by identifying a common monomial factor (GCF) • Recognize the pattern for a difference of two squares and factor • Factor a quadratic in the form $ax^2 + bx + c$ where $a = 1$ • Factor by grouping • Factor $ax^2 + bx + c$ where $a > 1$ • Solve equations using zero product property and square roots	• Homework • Tests • Quizzes • Independent Work • Group Work	2.1.8.A 2.1.11.A 2.2.8.A 2.2.11.A 2.4.11.E 2.5.8.C 2.5.11.A 2.5.11.C 13.3.11.B 13.3.11.E M11.A.1.2.1 M11.D.2.2.2 M11.D.2.1.5

Unit	Num	Objective	Level	Content	Evaluation	Standard
X. Probability and Statistics (OPTIONAL REVIEW)	10	Students will be able to compute probabilities. Students will design and conduct an experiment using random sampling. Students will calculate measures of central tendencies.	L/U	• Calculate probabilities for independent, dependent and compound events • Design and conduct an experiment using random sampling • Draw conclusions from experimental data • Calculate range, quartiles, and interquartiles • Compute the mean, median, and mode for a set of data • Determine which measure of central tendency is appropriate for authentic data sets • Make predictions using measures of central tendency • Analyze data from box and whiskers, stem and leaf, and scatter plots	• Homework • Tests • Quizzes • Independent Work • Group Work	2.1.11.A 2.2.8.A 2.2.11.A 2.2.11.C 2.4.8.F 2.4.11.E 2.5.8.C 2.5.8.D 2.5.11.A 2.5.11.B 2.5.11.C 2.5.11.D 2.6.8.A 2.6.8.C 2.6.8.D 2.6.11.H 2.7.8.B 2.7.8.C 2.7.8.D 2.7.8.E 2.7.11.C 2.7.11.D 2.7.11.E 2.8.11.M 2.8.11.Q 2.8.11.R 3.7.10.A 3.7.10.B M11.E.1.1.2 M11.E.2.1.1 M11.E.3.1.1 M11.E.4.1.2

Unit	Num	Objective	Level	Content	Evaluation	Standard
XI. Radical Expressions	11	Students will be able to simplify expressions and equations with radicals.	L/U	• Simplify square roots • Apply the Pythagorean Theorem to right triangles • Simplify radicals involving products and quotients • Simplify sums and differences of radical expressions • Simplify products and quotients of radical expressions • Solve equations that contain radical expressions • Identify extraneous solutions	• Homework • Tests • Quizzes • Independent Work • Group Work	M11.A.1.1.3 M11.A.2.2.1 M11.C.1.4.1