East Penn School District
Secondary Curriculum

A Planned Course Statement
for
Algebra II CP

Course # **314** Grade(s) 8 -12

Department: Mathematics

Length of Period (mins.) 41 Total Clock Hours: 126

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

Type of Offering: _____ required ___√___ elective

Credit: 1

Adopted: 6/28/10

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Description of Course #314

Course Title: Algebra II CP

Description: This course utilizes the skills learned in Algebra I. Designed primarily for college-bound students, the course includes the study of real numbers, first degree equations and inequalities, factoring polynomials, relations, graphs and functions, systems of linear equations, quadratic equations, complex numbers, ratio, proportion and variation, rational expressions, and radicals.

Goals:

- To develop proficiency in the students' ability to use algebra in solving problems while introducing students to concepts that are developed in higher mathematics.

Requirements:

- Prerequisite: Algebra I (C or better)

Text: Bellman, Bragg, Charles, Handlin, Kennedy, Algebra 2. Prentice Hall, Inc. Upper Saddle River, NJ 2004.

****** *A graded project will be completed during each semester in this course.***

****** *Careers that utilize the mathematics taught in this course will be discussed during the first semester.***

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.

Course Objectives –

Unit	Num	Objective	Level	Content	Evaluation	Standard
Quadratic Functions and Relations	1	Students will model and compare values of complex numbers.	L	• Graph points on the complex number plane • Simplify expressions involving complex numbers • Perform operations involving complex numbers	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.1.A2.A.
	2	Students will use factoring to create equivalent forms of polynomials.	U	• Factor out greatest common factors • Factor quadratic expressions • Factor sum/difference of cubes • Factor by grouping	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.1.A2.B.
Exponential and Logarithmic Functions and Relations	3	Students will use exponential and calculator notation to represent any rational number.	L	• Exponent rules • Order of operations	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.1.A2.D.
	4	Students will understand the concepts of exponential and logarithmic forms and use the inverse relationships between exponential and logarithmic expression to determine unknown quantities in equations.	U	• Rewrite logarithmic and exponential expressions in the inverse form • Solve logarithmic and exponential equations • Simplify logarithmic expressions using rules of logarithms	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.1.A2.F.
Equations and Inequalities	5	Students will evaluate numerical expressions that include the four basic operations and operations of powers and roots, reciprocals, opposites, and absolute values.	L	• Use order of operations • Simplify and evaluate expressions using exponent rules • Simplify and evaluate radical expressions • Find the reciprocal, opposite, and absolute value of a quantity	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.2.A2.C.
	6	Students will develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts.	U	• Set up appropriate equations to solve word problems • Check answers for reasonableness when solving problems • Check for extraneous roots when solving problems • Give explanations for how problems were solved	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.5.A2.A. 3.7.12.A.

Course Objectives –

Unit	Num	Objective	Level	Content	Evaluation	Standard
Systems of Equations and Inequalities	7	Students will use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas, and results.	L	• Solve systems of equations • Graph linear inequalities • Graph absolute value equations • Solve linear programming problems	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.5.A2.B. 3.7.12.A.
Linear Relations and Functions	8	Students will construct a line of best fit and calculate its equation for linear data.	U	• Create scatterplots from data • Find the equation of the line of best fit	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.6.A2.C.
	9	Students will make predictions based on lines of best fit.	U	• Use the graph of the line of best fit to extrapolate and interpolate values • Use the equation of the line of best fit to extrapolate and interpolate values	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.6.A2.E.
Probability and Odds	10	Students will use probability to predict the likelihood of an outcome in an experiment.	U	• Find simple probabilities • Find probabilities of multiple events	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.7.A2.A.
	11	Students will compare odds and probability.	L	• Determine odds from a probability • Determine a probability from odds	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.7.A2.C.
	12	Students will use probability to make judgments about the likelihood of various outcomes.	U	• Find number of permutations and combinations of a given situation • Solve word problems involving probabilities	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.7.A2.E.
Linear Functions and Relations	13	Students will evaluate and simplify algebraic expressions and solve and graph linear, quadratic, exponential, and logarithmic equations and solve and graph systems of equations and inequalities.	U	• Evaluate algebraic expressions • Simplify algebraic expressions • Solve and graph linear equations in two variables • Solve and graph linear inequalities in two variables	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.8.A2.B. Additional topic

Unit	Num	Objective	Level	Content	Evaluation	Standard
				• Solve and graph quadratic equations • Solve and graph exponential equations • Solve and graph logarithmic equations • Solve and graph systems of linear equations in two variables • Solve and graph systems of linear inequalities in two variables		
	14	Students will demonstrate an understanding and apply properties of functions (domain, range, inverses) and characteristics of families of functions (linear, quadratic, absolute value, exponential, logarithmic).	L	• Find the inverse of a function • Find the domain of a function • Find the range of a function • Describe what the graphs of linear, quadratic, exponential and logarithmic functions would look like without graphing • Determine the number of solutions of a quadratic function without solving • Perform operations with functions including composition of functions	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.8.A2.D.
	15	Students will demonstrate an understanding and apply properties of absolute value functions.	U	• Solve absolute value equations and inequalities • Graph absolute value functions and inequalities	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	
Systems of Equations and Inequalities	16	Students will use combinations of symbols and numbers to create expressions, equations, and inequalities in two or more variables, systems of equations and inequalities, and functional relationships that model problem situations.	U	• Modeling and solving application problems • Completing linear programming problems	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.8.A2.E.
	17	Students will interpret the results of solving equations, inequalities, systems of equations, and inequalities in the context of the situation that motivated the model.	U	• Check for extraneous solutions • Interpret results and verify if solutions are reasonable	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.8.A2.F.

Course Objectives –

Unit	Num	Objective	Level	Content	Evaluation	Standard
Linear Relations and Functions	18	Students will use algebraic techniques to determine if two lines are parallel and / or perpendicular; find points of intersections.	R	• Solve systems of linear equations • Rewrite equations in slope-intercept form • Find the slope of a line • Compare slopes of lines	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.9.A2.A.
	19	Students will determine and interpret maximum and minimum values of a function over a specified interval.	L	• Find the vertex of a quadratic equation • Find the minimum/maximum value of a quadratic equation	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.11.A2.A.
Exponential and Logarithmic Functions and Relations	20	Students will analyze and interpret rates of growth/decay.	L	• Write and solve equations involving population growth/decay • Write and solve equations involving compound interest	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.11.A2.B. 13.3.11.D.
Inverses and Radical Functions and Relations	21	Students will perform operations and simplify radical expressions.	L	• Simplify radical expressions • Add, subtract, multiply and divide radical expressions • Write expressions as both radical and rational exponent • Solve equations involving radicals • Rationalizing denominators using conjugates	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.1.A2.A 2.2.A2.F
Rational Functions and Relations	22	Students will demonstrate an understanding of rational functions.	L	• Simplify rational expressions • Perform operations with rational expressions • Solve equations with rational expressions • State restrictions on domain and check for extraneous solutions	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.8.A2.D
Equations and Inequalities	23	Students will solve a formula for a given variable using algebraic processes.	U	• Solve literal equations	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.3.A2.C
Sequences and Series	24	Students will recognize, describe and generalize patterns using sequences and series to predict long-term outcomes	A	• Recognize arithmetic sequences and use appropriate formulas to solve for terms and sums • Recognize geometric sequences and use appropriate formulas to solve for terms and sums	• Teacher Observation • Assignments • Quizzes • Tests • Alternative Assessments	2.8.A2.C