Algebra II Prioritized Curriculum	**Essential**	**Important**	**Compact**
M.O.A2.2.1 determine equations of lines including parallel, perpendicular, vertical and horizontal lines, and compare and contrast the properties of these equations.	X		
M.O.A2.2.2 factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes; analyze and describe the relationship between the factored form and the graphical representation.		X	
M.O.A2.2.3 define complex numbers, simplify powers of 'i', perform basic operations with complex numbers, and give answers as complex numbers in simplest form.			X
M.O.A2.2.4 simplify expressions involving radicals and fractional exponents, convert between the two forms, and solve equations containing radicals and exponents.	X		
M.O.A2.2.5 solve quadratic equations over the set of complex numbers: apply the techniques of factoring, completing the square, and the quadratic formula; use the discriminate to determine the number and nature of the roots; identify the maxima and minima; use words, graphs, tables, and equations to generate and analyze solutions to practical problems.	X		
M.O.A2.2.6 develop and use the appropriate field properties of matrices by adding, subtracting, and multiplying; solve a system of linear equations using matrices; and apply skills toward solving practical problems.		X	
M.O.A2.2.7 define a function and find its zeros; express the domain and range using interval notation; find the inverse of a function; find the value of a function for a given element in its domain; and perform basic operations on functions including composition of functions.	X		

M.O.A2.2.8 analyze families of functions and their transformations; recognize linear, quadratic, radical, absolute value, step, piece-wise, and exponential functions; analyze connections among words, graphs, tables and equations when solving practical problems with and without technology	X		
M.O.A2.2.9 solve quadratic inequalities, graph their solution sets, and express solutions using interval notation.		X	
M.O.A2.2.10 solve and graph the solution set of systems of linear inequalities in two variables by finding the maximum or minimum values of a function over the feasible region using linear programming techniques.	X		
M.O.A2.2.11 solve practical problems involving direct, inverse and joint variation.	X		
M.O.A2.2.12 analyze the conic sections; identify and sketch the graphs of a parabola, circle, ellipse, and hyperbola and convert between graphs and equations.		X	
M.O.A2.2.13 solve absolute value inequalities graphically, numerically and algebraically and express the solution set in interval notation.			X
M.O.A2.2.14 define a logarithmic function, transform between exponential and logarithmic forms, and apply the basic properties of logarithms to simplify or expand an expression.		X	
M.O.A2.2.15 identify a real life situation that exhibits characteristics of change that can be modeled by a quadratic equations; pose a questions; make a hypothesis as to the answer; develop, justify, and implement a method to collect, organize and analyze related data; extend the nature of collected, discrete data to that of a continuous function that describes the known data set; generalize the results to make a conclusion; compare the hypothesis and the conclusion; present the project numerically, analytically, graphically and verbally using the predictive and analytic tools of algebra (with and without technology).	X		
M.O.A2.2.16 describe and illustrate how patterns and sequences are used to develop recursive and closed form equations; analyze and describe characteristics of each form.		X	

Fayette County Schools
Mathematics Learning Map

Algebra II — 1st Nine Weeks

Unit EQ	In what ways do relations, functions, inequalities, and graphs of functions and their inverses help us interpret real-world events or solve problems?			Of what benefit is linear programming when making business decisions?	How can a quadratic equation or inequality be used to model real-world situations?
Benchmark CSOs	M.O.A2.2.1 determine equations of lines including parallel, perpendicular, vertical and horizontal lines, and compare and contrast the properties of these equations.	M.O.A2.2.8 analyze families of functions and their transformations; recognize linear, quadratic, radical, absolute value, step, piece-wise, and exponential functions; analyze connections among words, graphs, tables and equations when solving practical problems with and without technology	M.O.A2.2.13 solve absolute value inequalities graphically, numerically and algebraically and express the solution set in interval notation.	M.O.A2.2.10 solve and graph the solution set of systems of linear inequalities in two variables by finding the maximum or minimum	M.O.A2.2.5 solve quadratic equations over the set of complex numbers: apply the techniques of factoring, completing the square, and the quadratic formula; use the discriminate to determine the number and nature of the roots; identify the maxima and minima; use words, graphs, tables, and equations to generate and analyze solutions to practical problems.
Standards Based Math Unit	Carnegie Learning Textbook Algebra II – Chapter 1			Carnegie Learning Textbook Algebra II–Chapter 2 (Excluding Sec. 2.4 & 2.7)	Carnegie Learning Textbook Algebra II – Chapter 3
21st Century Online Resources	I Can Statements	*Online Algebra II Instructional Guide I: Functions* Teach21 Instructional Guide	*Online Algebra II Instructional Guide I: Functions* Teach21 Instructional Guide		
Lesson EQ's	1. How does solving an absolute value equation compare to solving a linear equation? 2. What is the difference in set-builder notation and interval notation?	1. How are equations of parallel, perpendicular, horizontal, and vertical lines different? 2. How are equations of parallel lines, perpendicular lines,	1. How do you use intercepts to graph linear equations? 2. What are the distinguishing features of the following functions: linear, quadratic, radical,	1. What is the meaning of the intersecting regions resulting from graphing systems of inequalities? 2. Why is it important to identify the vertices of a polygonal region	1. What makes a set of data quadratic? 2. How is the discriminate used to determine the number and nature of the roots of a quadratic equation?

		horizontal, and vertical lines alike? 3. How are the graphs within a family related?	absolute value, step, piece-wise, and exponential? 4. What can you learn by analyzing the graph of a function?	resulting from the graphing of a system of inequalities? 3. What can be determined when you know the maximum and/or the minimum value(s) of a feasible region?	3. What are the maxima and the minima and how are they useful? 4. How does factoring, completing the square, and the quadratic formula help solve quadratic equations over the set of complex numbers? 5. How can quadratic functions with real coefficients have complex solutions?

Vocabulary:

Chapter 1:

Function
Dependent Quantity
Inequality
Absolute Value Equations
Functional Notation
Composition of Functions
Linear Function
Transformations
Point-slope Form of Equation
Absolute Value Inequalities
Identity Function
Piecewise Functions
Independent Quantity
Simplifications
Two-point Form of Equation
Compound Inequalities
Inverse Function

Chapter 2:

Systems of Linear Equations
Inconsistent
Linear Combinations (Elimination)
Systems of Linear Equations in Two Variables
Consistent

Chapter 3:

Quadratic Function
Zero
Perfect Square Trinomial
Parabola
Discriminant
Quadratic Equation
Root
Completing the Square
Axis of Symmetry
Vertex Form of a Quadratic Equation
Vertex
Difference of Two Squares
Quadratic Formula
Second Difference

Fayette County Schools
Mathematics Learning Map

Algebra II — 2nd Nine Weeks

Unit EQ	What makes the complex number system important? Why do we need the complex number system?		How can functions model real-world situations?	How does an understanding of exponential, logarithmic, polynomial and rational functions aid in the understanding and interpretation of events in business, science, and mathematics?
Benchmark CSOs	M.O.A2.2.3 define complex numbers, simplify powers of 'i', perform basic operations with complex numbers, and give answers as complex numbers in simplest form.	M.O.A2.2.2 factor higher order polynomials by applying various methods including factoring by grouping and the sum and difference of two cubes; analyze and describe the relationship between the factored form and the graphical representation.	M.O.A2.2.7 define a function and find its zeros; express the domain and range using interval notation; find the inverse of a function; find the value of a function for a given element in its domain; and perform basic operations on functions including composition of functions.	M.O.A2.2.14 define a logarithmic function, transform between exponential and logarithmic forms, and apply the basic properties of logarithms to simplify or expand an expression.
Textbook Correlation	Carnegie Learning Textbook Chapter 4	Carnegie Learning Textbook Chapter 5		Carnegie Learning Textbook Chapter 6
21st Century Online Resources	I Can Statements	http://www.techsteps.com/ Core Projects – Algebra II – Linear Systems by Matrices Activity – Quadratic Transformations	*Online Algebra II Instructional Guide I: Functions* Teach21 Instructional Guide	http://www.techsteps.com/ Activities – Algebra II – Exponential Regressions
Lesson EQ's	1. How are the powers of *i* simplified? 2. What makes a number complex? 3. How can it be determined that a complex number is in simplest form?	1. What relationships exist between the factored form of a polynomial representation and a graphical representation? 2. How can quadratic functions with real coefficients have complex solutions? 3. Why is one form of a polynomial expression more useful than another?	1. What are the common characteristics of the graph, the equation, the factors and the zeros of a quadratic function? 2. What does it mean to define a function? 3. How are the zeros of a quadratic equation and the solutions of the equation related? 4. What is the inverse of a function and how do you find it? 5. How is the value of a function found for a given element in its domain? 6. How is the composition of a function determined?	1. How are families of exponential functions related? 2. How can it be determined if a logarithmic expression represents exponential growth or decay? 3. Why is it important to rewrite the terms in an exponential equation until they have the same base? 4. How is the inverse of a logarithmic function written? 5. How is compound interest related to the natural base?

Vocabulary:

Chapter 4:

Number Sets	Closure	Properties of Real Numbers
Exponentiation	Rational Exponents	Imaginary Numbers
Complex Numbers	Conjugate of a Complex Number	Power of a Complex Number
Root of a Complex Number		

Chapter 5:

Cubic	Polynomial Function	Degree of a Polynomial
Polynomial Expression	Polynomial Equation	Polynomial Inequality
Continuous Function	Zeros of a polynomial Function	Quartic
Fundamental Theorem of Algebra	Complex Roots	Multiplicity
Synthetic Division	Remainder Theorem	Factor Theorem
Power Functions	Absolute Minimum	Absolute Maximum
Extrema	End Behavior	

Chapter 6:

Exponential Function	Negative Exponent	Rational Exponent
Exponential Growth	Exponential Decay	Logarithm
Base of a Logarithm	Common Logarithm	Natural Logarithm
Natural Exponent		

Fayette County Schools
Mathematics Learning Map

Algebra II — 3rd Nine Weeks

Unit EQ	How can you recognize the type of variation that is occurring in a given situation?	When are you likely to encounter equations containing radicals and exponents?	How are man-made conics used to improve life?
Benchmark CSOs	M.O.A2.2.11 solve practical problems involving direct, inverse and joint variation.	M.O.A2.2. 4 simplify expressions involving radicals and fractional exponents, convert between the two forms, and solve equations containing radicals and exponents.	M.O.A2.2.12 analyze the conic sections; identify and sketch the graphs of a parabola, circle, ellipse, and hyperbola and convert between graphs and equations.
Textbook Correlation	Carnegie Learning Textbook Algebra II – Chapter 7	Carnegie Learning Textbook Algebra II – Chapter 8	Carnegie Learning Textbook Algebra II – Chapter 9
21st Century Online Resources	I Can Statements		http://www.techsteps.com/ Activities – Algebra II – The Ellipse
Lesson EQ's	1. What are the differences in a direct variation, a joint variation, and an inverse variation?	1. How is an equation containing radicals converted to an equation containing fractions? 2. How is simplifying expressions involving radicals and fractional exponents different from simplifying expressions involving only integers?	1. How does factoring aid in graphing conic sections? 2. How can each of the types of conics be constructed? 3. How can the definition be used to verify the reflective properties of each conic? 4. How is the graph of each conic determined from the equation of the conic? 5. How is the equation of each conic determined from the graph of the conic?

Vocabulary:

Chapter 7: Rational Function, Rational Equation, Asymptotes, Extraneous Solution, Inverse Variation, Constant of Variation, Greatest Integer Function, Rational Expressions, Step Functions

Chapter 8: Radical Function, Principal Root, Vertical Line Test

Chapter 9: Conic Sections, Vertices, Transverse Axis, Circle, Minor Axis, Conjugate Axis, Loci, Foci, Directrix, Ellipse, Eccentricity, Major Axis, Hyperbola

Fayette County Schools
Mathematics Learning Map

Algebra II — 4th Nine Weeks

Unit EQ	Why is it important to be able to effectively analyze patterns and sequences?	How does a quadratic equation model real life situations that exhibit characteristics of change?	How are matrices used to analyze complex situations, represent data and solve problems?
Benchmark CSOs	M.O.A2.2.16 describe and illustrate how patterns and sequences are used to develop recursive and closed form equations; analyze and describe characteristics of each form.	M.O.A2.2.15 identify a real life situation that exhibits characteristics of change that can be modeled by a quadratic equations; pose a questions; make a hypothesis as to the answer; develop, justify, and implement a method to collect, organize and analyze related data; extend the nature of collected, discrete data to that of a continuous function that describes the known data set; generalize the results to make a conclusion; compare the hypothesis and the conclusion; present the project numerically, analytically, graphically and verbally using the predictive and analytic tools of algebra (with and without technology).	M.O.A2.2.6 develop and use the appropriate field properties of matrices by adding, subtracting, and multiplying; solve a system of linear equations using matrices; and apply skills toward solving practical problems.
Textbook Correlation	Carnegie Learning Textbook Algebra II – Chapter 12(Sections 1 & 2)	Carnegie Learning Textbook Algebra II - Chapter 14 (Sections 4 & 5)	Carnegie Learning Textbook Algebra II – Chapter 15
21st Century Online Resources	I Can Statements	*Online Algebra II Instructional Guide 3: Quadratic Equations Over Real and Complex Numbers* Teach21 Instructional Guide	*Online Instructional Guide: Solving Systems of Equations and Inequalities* Teach21 Instructional Guide
Lesson EQ's	1. How is the common difference used to write an expression for an arithmetic sequence? 2. Why is sigma notation used? 3. How are geometric and arithmetic sequences different? Alike? 4. What are the distinguishing characteristics of special sequences?	1. How do the graphs of discrete and continuous data differ? 2. What are the advantages of presenting data in each of the following forms: numerically, analytically, graphically and verbally? 3. What are the disadvantages of presenting data in each of the following forms: numerically, analytically, graphically and verbally?	1. Is it possible to have a matrix of any dimension? 2. Can the entries of a matrix occur in a different order? 3. What is the significance of the size and entries of a matrix?

Vocabulary:

Chapter 12:

Sequence	Term	Arithmetic Sequence
Common Difference	Index	Explicit Formula
Recursive Formula	Geometric Sequence	Common Ratio

Chapter 14:

Correlation	Line of Best Fit	Linear Regression
Method of Least Squares	Correlation Coefficient	Quadratic Regression
Exponential Regression		

Chapter 15:

Matrices	Scalar Multiplication	Additive Identity Matrix
Additive Inverse Matrix	Square Matrix	Multiplicative Identity Matrix
Algorithm	Gaussian Elimination	Matrix Equations