

DEPARTMENT: MATHEMATICS	COURSE TITLE: ALGEBRA II: FUNCTIONS COURSE NUMBER: 322
GRADE(S): 10-12	PRE-REQUISITES: C- OR BETTER IN ALGEBRA I

UNIT	LENGTH	CONTENT	SKILLS	METHODS OF ASSESSMENT	FRAMEWORK STRAND(S) & STANDARD(S)
Algebraic Notation	1 week	<ul style="list-style-type: none"> • Variables • Order of operations • Domain and range • Describing situations through algebra • Sequences • Inequalities 	<ul style="list-style-type: none"> • Write and solve equations • Simplify expressions • Use algebraic vocabulary • Understand subscript notation and sequences • Rewrite equations • Graph inequalities on a number line • Use the graphing calculator 	<ul style="list-style-type: none"> • Tests and quizzes • Homework • Projects • Notebooks • Portfolios 	AII.P.1, AII.P.2
Function Concept	1 week	<ul style="list-style-type: none"> • Functions vs. relations • Recognition of various functions from equations, graphs, ordered pairs, or table of values • Independent and dependent variables 	<ul style="list-style-type: none"> • Graph functions • Use the vertical line test • Recognize functions • Distinguish between independent and dependent variables • Graph functions on calculator 	<ul style="list-style-type: none"> • Tests and quizzes • Homework • Projects • Notebooks • Portfolios 	AII.P.6
Linear Relations	2 weeks	<ul style="list-style-type: none"> • Recognition of linear functions from equations, graphs, or table of values • Slope and intercepts • Different forms of linear equations • Lines as solution sets • Linear inequalities 	<ul style="list-style-type: none"> • Write equations of lines in point-slope form, standard form, and slope-intercept form • Understand arithmetic sequences • Graph lines and linear inequalities • Check solutions • Recognize situations that are linear 	<ul style="list-style-type: none"> • Tests and quizzes • Homework • Projects • Notebooks • Portfolios 	AII.P.2, AII.G.3
Systems	2 weeks	<ul style="list-style-type: none"> • Recognition of systems of equations, both graphically and algebraically • Solution strategies • Graphing systems • Systems of inequalities • Linear programming • Consistent and inconsistent systems 	<ul style="list-style-type: none"> • Write systems of equations • Solve systems by graphing • Solve systems by substitution or linear combination method • Identify number of solutions • Determine whether a point is a solution • Graph and list solutions to a system of inequalities 	<ul style="list-style-type: none"> • Tests and quizzes • Homework • Projects • Notebooks • Portfolios 	AII.P.10

Variation	1 week	<ul style="list-style-type: none"> • Direct and inverse variation • Joint or combined variation • Fundamental theorem of variation 	<ul style="list-style-type: none"> • Write equations of variation • Graph equations and data • Find constant of variation • Fit an equation to data 	<ul style="list-style-type: none"> • Tests and quizzes • Homework • Projects • Notebooks • Portfolios 	AII.P.11
Quadratic Functions	5 weeks	<p>Recognition of:</p> <ul style="list-style-type: none"> • Quadratic equations and parabolas • X and y intercepts • Vertex • Line of symmetry, • Minimum/maximum values • Forms of quadratic equations • Focus and directrix • Graph translation theorem • Discriminant, imaginary and complex numbers 	<ul style="list-style-type: none"> • Multiply and square binomials • Write equations of quadratics in vertex form, standard form, and factored form • Complete the square • Use the quadratic formula • Factor quadratic expressions • Find lines of symmetry • Find x and y intercepts of parabolas • Find maximum and minimum values • Apply knowledge of vertex and intercepts to real-world problems • Graph parabolas given focus and directrix • Use and apply the distance formula • Graph parabolas given a quadratic equation • Find number of solutions • Understand the definition of i and complex numbers • Add and multiply complex numbers • Graph complex numbers 	<ul style="list-style-type: none"> • Tests and quizzes • Homework • Projects • Notebooks • Portfolios 	AII.N.1, AII.P.3, AII.P.7, AII.P.12, AII.G.3
Function Notation	2 weeks	<ul style="list-style-type: none"> • Euler's notation and mapping notation of functions • Domain and range • Inverse functions • Composition of functions • Absolute value functions • Step (greatest integer) functions • Piecewise-defined functions • Translations of functions 	<ul style="list-style-type: none"> • Use and understand function notation • Graph a variety of common functions • Identify domain and range from equations or graphs • Graph inverses as reflections • Find equations of inverses • Compose functions • Translate graphs vertically 	<ul style="list-style-type: none"> • Tests and quizzes • Homework • Projects • Notebooks • Portfolios 	AII.P.5, AII.P.11, AII.P.13

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Exponential Functions	3 weeks	<ul style="list-style-type: none"> • Properties of powers (positive and negative integers and fractions) • nth roots • Compound interest • Exponential growth/decay • Equations involving exponents 	<ul style="list-style-type: none"> • Simplify expressions and solve equations involving powers and roots • Write equations of exponential growth/decay • Graph exponential functions 	<ul style="list-style-type: none"> • Tests and quizzes • Homework • Projects • Notebooks • Portfolios 	AII.N.2, AII.P.4, AII.P.11, AII.G.3
Logarithms	2 weeks	<ul style="list-style-type: none"> • Definition of common and natural logarithms • Solving for variables as exponents • Properties of logarithms 	<ul style="list-style-type: none"> • Apply the definition of logarithms • Solve equations using logarithms • Graph logarithms 	<ul style="list-style-type: none"> • Tests and quizzes • Homework • Projects • Notebooks • Portfolios 	AII.P.4, AII.P.11
Polynomials	4 weeks	<ul style="list-style-type: none"> • Definition of polynomials • Operations involving polynomials • Graphs and equations of polynomials • Roots (zeros, solutions, x-intercepts) of polynomials 	<ul style="list-style-type: none"> • Write equations of polynomials • Add, subtract, multiply, and divide polynomials • Graph and analyze graphs of polynomials • Factor polynomials • Use synthetic division, find roots and number of roots of polynomials 	<ul style="list-style-type: none"> • Tests and quizzes • Homework • Projects • Notebooks • Portfolios 	AII.P.3, AII.P.11, AII.P.12, AII.G.3