

<b>DEPARTMENT: MATHEMATICS</b>	<b>COURSE TITLE: ALGEBRA II: REAL &amp; COMPLEX VARIABLES/HONORS</b> <b>COURSE NUMBER: 324</b>
<b>GRADE(S): 9-11</b>	<b>PRE-REQUISITES (IF ANY): A MINIMUM OF C IN ALGEBRA HONORS OR B- IN ALGEBRA II: FUNCTIONS</b>

<b>UNIT</b>	<b>LENGTH</b>	<b>CONTENT</b>	<b>SKILLS</b>	<b>METHODS OF ASSESSMENT</b>	<b>FRAMEWORK STRAND(S) &amp; STANDARD(S)</b>
Sequences	7 days	<ul style="list-style-type: none"> <li>• Pattern recognition</li> <li>• Recursive and explicit formulas</li> <li>• Arithmetic and geometric sequences</li> </ul>	<ul style="list-style-type: none"> <li>• Describe sequences using subscript notation</li> <li>• Describe sequences using recursive and explicit formulas</li> <li>• Distinguish between arithmetic and geometric sequences</li> <li>• Connect sequences to their graphical representations</li> </ul>	<ul style="list-style-type: none"> <li>• Homework</li> <li>• Test</li> </ul>	3, 4, 12
Functions	10 days	<ul style="list-style-type: none"> <li>• Definition of a function</li> <li>• Euler notation</li> <li>• Linear and piecewise notation</li> <li>• Composition</li> <li>• Inverses</li> </ul>	<ul style="list-style-type: none"> <li>• Understand the characteristics of a function</li> <li>• Use function notation (<math>f(x)</math>) correctly</li> <li>• Use linear and piecewise functions to model real world situations</li> <li>• Create a composite function</li> <li>• Find the inverse of a function</li> </ul>	<ul style="list-style-type: none"> <li>• Homework</li> <li>• Test</li> <li>• Writing project</li> <li>• Graded assignment</li> </ul>	7, 8, 10, 12
Quadratic Functions	10 days	<ul style="list-style-type: none"> <li>• Vertex, standard, and factored forms</li> <li>• Writing equations of quadratics</li> <li>• Applications of quadratics</li> </ul>	<ul style="list-style-type: none"> <li>• Find the roots of a quadratic equation given any of its forms</li> <li>• Graph a quadratic equation given any of its forms</li> <li>• Find the equation of any form given the graph of a parabola</li> <li>• Apply the concepts learned to practical situations</li> </ul>	<ul style="list-style-type: none"> <li>• Homework</li> <li>• Test</li> <li>• Writing assignment</li> <li>• Graded assignment</li> </ul>	9, 10, 11, 12, 13
Polynomial Functions I	10 days	<ul style="list-style-type: none"> <li>• Definition of a polynomial function</li> <li>• Polynomial graphs, roots, equations</li> </ul>	<ul style="list-style-type: none"> <li>• Distinguish between polynomial and non-polynomial functions</li> <li>• Graph polynomials by making tables</li> <li>• Find roots algebraically</li> <li>• Make sign charts</li> <li>• Determine general behavior of even vs. odd degree polynomials</li> <li>• Apply concepts learned to efficiently graph a polynomial or find an equation of a polynomial graph</li> </ul>	<ul style="list-style-type: none"> <li>• Homework</li> <li>• Test</li> <li>• Writing assignment</li> </ul>	8, 10, 12

Polynomial Functions II	12 days	<ul style="list-style-type: none"> <li>• Roots by long division and synthetic division</li> <li>• Rational root theorem</li> <li>• Method of finite differences</li> <li>• Applications</li> </ul>	<ul style="list-style-type: none"> <li>• Use synthetic division or long division to determine whether a number is a root of a polynomial</li> <li>• Use rational root theorem to determine possible rational roots</li> <li>• Use the method of finite difference to determine whether a table of values can be modeled by a polynomial function</li> <li>• Apply the concepts learned to practical situations</li> </ul>	<ul style="list-style-type: none"> <li>• Homework</li> <li>• Test</li> <li>• Polynomial Jeopardy</li> </ul>	10, 11, 12
Complex Numbers	6 days	<ul style="list-style-type: none"> <li>• Complex numbers computation</li> <li>• The complex plane</li> <li>• Results for polynomials</li> </ul>	<ul style="list-style-type: none"> <li>• Define a complex number</li> <li>• Perform computations using complex numbers</li> <li>• Find complex roots of polynomials</li> <li>• Graph complex numbers on the complex plane</li> </ul>	<ul style="list-style-type: none"> <li>• Homework</li> <li>• Quiz</li> <li>• Test</li> </ul>	1, 9, 10, 12
Rational Functions	9 days	<ul style="list-style-type: none"> <li>• Graphs of rational functions</li> </ul>	<ul style="list-style-type: none"> <li>• Identify a rational function</li> <li>• Identify domain and range</li> <li>• Find vertical, horizontal, and oblique asymptotes</li> <li>• Find “holes” in the graph</li> <li>• Apply concepts learned to efficiently graph a rational function</li> <li>• Apply the concepts learned to practical situations</li> </ul>	<ul style="list-style-type: none"> <li>• Homework</li> <li>• Computer Lab</li> <li>• Quiz</li> <li>• Test</li> </ul>	8, 10, 12
		<i>End of first trimester</i>			
Complex Numbers	6 days	<ul style="list-style-type: none"> <li>• Complex numbers computation</li> <li>• The complex plane</li> <li>• Results for polynomials</li> </ul>	<ul style="list-style-type: none"> <li>• Define a complex number</li> <li>• Perform computations using complex numbers</li> <li>• Find complex roots of polynomials</li> <li>• Graph complex numbers on the complex plane</li> </ul>	<ul style="list-style-type: none"> <li>• Homework</li> <li>• Quiz</li> <li>• Test</li> </ul>	1, 9, 10, 12
Exponents	7 days	<ul style="list-style-type: none"> <li>• Exponent rules</li> <li>• Solving equations</li> </ul>	<ul style="list-style-type: none"> <li>• Simplify expressions using the rules of exponents</li> <li>• Solve equations involving exponents</li> </ul>	<ul style="list-style-type: none"> <li>• Homework</li> <li>• Quiz</li> <li>• Test</li> </ul>	2, 12
Exponential Functions	7 days	<ul style="list-style-type: none"> <li>• Definition of an exponential function</li> <li>• Graphs</li> <li>• Models</li> <li>• Economic applications</li> </ul>	<ul style="list-style-type: none"> <li>• Graph exponential functions</li> <li>• Find an exponential equation from data</li> <li>• Apply concepts learned to financial situations such as compound interest</li> </ul>	<ul style="list-style-type: none"> <li>• Homework</li> <li>• Quiz</li> <li>• Test</li> </ul>	4, 6, 8, 10, 11, 12

Logarithms	11 days	<ul style="list-style-type: none"> <li>• Definition of logarithm</li> <li>• Laws of logarithms</li> <li>• Solving equations</li> <li>• Applications</li> </ul>	<ul style="list-style-type: none"> <li>• Convert exponential equations to logarithms and vice versa</li> <li>• Graph logarithmic functions</li> <li>• Simplify expressions using laws of logarithms</li> <li>• Solve exponential equations using logs</li> <li>• Apply concepts learned to practical situations</li> </ul>	<ul style="list-style-type: none"> <li>• Homework</li> <li>• Test</li> <li>• Creative writing project</li> </ul>	6, 8, 10, 12
Transformations of Functions	10 days	<ul style="list-style-type: none"> <li>• Types of transformations</li> <li>• Graphs</li> <li>• Symmetry</li> <li>• Even and odd functions</li> </ul>	<ul style="list-style-type: none"> <li>• Describe a particular transformation in both words and Euler notation</li> <li>• Graph the function which results from transformations applied to the parent function</li> <li>• Determine the equation of a function which results from transformations applied to a parent function</li> <li>• Determine if a relation has <math>x</math>-axis, <math>y</math>-axis, origin, or <math>y = x</math> symmetry</li> <li>• Determine whether a function is even or odd</li> </ul>	<ul style="list-style-type: none"> <li>• Homework</li> <li>• Quiz</li> <li>• Graphic design project</li> </ul>	7, 8, 10, 12, 14
Matrices	10 days	<ul style="list-style-type: none"> <li>• Operations with matrices</li> <li>• Inverses</li> <li>• Systems of equations</li> <li>• Applications</li> </ul>	<ul style="list-style-type: none"> <li>• Perform operations (addition, subtraction, scalar multiplication, matrix multiplication) with matrices</li> <li>• Find the inverse of a matrix</li> <li>• Use matrices to solve systems of linear equations</li> <li>• Apply concepts learned to practical situations</li> </ul>	<ul style="list-style-type: none"> <li>• Homework</li> <li>• Quiz</li> <li>• Test</li> </ul>	11, 12