Planned Course: Pre-Calculus	**Course Number: 308/309**	**Department: Math**	
Unit: Functions and Their Graphs	**Grade Level: 10-12**		
Estimated Time: 22 days	**Level/Track:**	**Date Approved: 08/20/02**	
Academic Standards	**Skills/Knowledge**	**Activities**	**Assessment**
2.8.11 Algebra and Functions J. Demonstrate the connection between algebraic equations and inequalities and the geometry of relations in the coordinate plane. 2.9.11 Geometry G. Solve problems using analytic geometry.	The student will be able to find the distance between two points. The student will be able to use the distance formula to solve geometry problems. The student will be able to find the midpoint of a line segment.	• Chalkboard examples • Exercises in textbook • Overhead transparencies	• Tests • Quizzes • Homework • Graded notebook • Projects/group projects
2.8.11 Algebra and Functions E. Use equations to represent curves (e.g. lines, circles, ellipses, parabolas, hyperbolas) Q. Represent functional relationships in tables, charts, and graphs. S. Analyze properties and relationships of functions (e.g. linear, polynomial, rational, trigonometric, exponential and logarithmic.	The student will be able to graph equations by plotting points. The student will be able to find intercepts from a graph or from an equation.	• Chalkboard examples • Exercises in textbook • Problems at chalkboard • Classroom use of calculator	• Tests • Quizzes • Homework • Graded notebook • Projects/group projects

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2.9.11 Geometry J. Analyze figures in terms of the kinds of symmetries they have.	The student will be able to test an equation for symmetry with respect to the origin, the x-axis, and the y-axis.	• Chalkboard examples • Exercises in textbook • Problems at chalkboard • Overhead transparencies	• Tests • Quizzes • Homework • Graded notebook • Projects/group projects
2.8.11 Algebra and Functions E. Use equations to represent curves (e.g. lines, circles, ellipses, parabolas, and hyperbolas). 2.9.11 Geometry G. Solve problems using analytic geometry.	The student will be able to write the equation of a circle satisfying given conditions. The student will be able to find the center and radius of a circle from a given equation. The student will be able to reduce an equation to the center-radius form and sketch the graph.	• Chalkboard examples • Exercises in textbook • Problems at chalkboard • Worksheets • Classroom use of calculator	• Tests • Quizzes • Homework • Graded notebook • Projects/group projects

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Academic Standards	Skills/Knowledge	Activities	Assessment
2.2.11 Computation and Estimation F. Demonstrate skills for using computer spreadsheets and scientific and graphing calculators. 2.8.11 Algebra and Functions O. Determine the domain and range of a relation, given the graph or a set of ordered pairs. Q. Represent functional relationships in tables, charts, and graphs. S. Analyze properties and relationships of functions (e.g. linear, polynomial, rational, trigonometric, exponential, and logarithmic). T. Analyze and characterize functions by their characteristics.	The student will be able to determine whether a relation represents a function. The student will be able to find the value of a function and find the domain of a function. The student will be able to identify the graph of a function. The student will be able to obtain information from or about the graph of a function. The student will be able to determine where a function is increasing, decreasing, or constant. The student will be able to use a graph to locate maxima and minima.	• Chalkboard examples • Exercises in textbook • Problems at chalkboard • Use of calculator in the classroom	• Tests • Quizzes • Homework • Graded notebook • Projects/group projects

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2.4.11 Mathematical Reasoning and Connections E. Demonstrate mathematical solutions to problems (e.g. in the physical sciences).	The student will be able to recognize special functions (constant, linear, identity, square, cube, square root, reciprocal, and absolute value) by their properties, particularly by the shape of their graph. The student will be able to identify odd and even functions graphically and algebraically. The student will be able to graph functions using transformations involving: horizontal and vertical shifts, compressions and stretches, and reflections about the x-axis or y-axis.		
2.8.11 Algebra and Functions O. Determine the domain and range of a relation, given a graph or a set of ordered pairs.	The student will be able to determine if a function is one-to-one. The student will be able to find the inverse of a one-to-one function and determine if the inverse is a function.	• Chalkboard examples • Exercises in textbook • Problems at chalkboard • Use of calculator in the classroom	• Tests • Quizzes • Homework • Graded notebook • Projects/group projects

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P. Analyze a relation to determine whether a direct or inverse variation exists and represent it algebraically and graphically. Q. Represent functional relationships in tables, charts, and graphs.	The student will be able to verify if functions are inverses of each other. The student will be able to find the domain and range of a function. The student will be able to graph a function and its inverse. The student will be able to obtain the graph of an inverse function from the graph of a function.		