<u>Topics</u>

Numbers, Data, and Problem Solving Visualization of Data Functions and Their Representations Types of Functions and Their Rates of Change

I. <u>Learning Outcomes</u>

- 1. Students will demonstrate the ability to classify numbers and to interpret data presented in visual or numeric forms.
- 2. Students will demonstrate the ability to convert numbers between standard and scientific notation, and to use scientific notation in numerical computations.
- 3. Students will demonstrate the ability to extrapolate necessary data and information from given application problems and to use this data and the processes of problem solving to successfully determine solutions.
- 4. Students will demonstrate the ability to distinguish corresponding sets as representations of relations or functions by the analysis of graphical, numeric, or symbolic data.
- 5. Students will demonstrate the ability to identify types of functions and to determine the domain, range, and average rate of change from their graphical, numeric, and symbolic representations.

<u>Topics</u>

Linear Functions and Models Equations of Lines Linear Equations Linear Inequalities Piece-wise Defined Linear Functions Linear Approximation

II. Learning Outcomes

- 1. Students will demonstrate the ability to solve linear equations, inequalities, and compound inequalities, and to represent solutions in set, interval, and graphical notations.
- 2. Students will demonstrate the ability to solve absolute value equations and inequalities.
- 3. Students will demonstrate the ability to graph linear functions and vertical lines, and to determine intercept(s) and slope.
- 4. Students will demonstrate the ability to write the equation of a linear function given the slope and a point on the line or given the slope and a parallel or perpendicular line.
- 5. Students will demonstrate the ability to graph a scatter plot of given points and to use regression to approximate a linear model.
- 6. Students will demonstrate the ability to evaluate and graph piece-wise defined linear functions.

MATH 1710 Course Topics & Learning Outcomes

<u>Topics</u>

Quadratic Functions and Models Quadratic Equations and Problem Solving Transformations of Graphs

III. Learning Outcomes

- 1. Students will demonstrate the ability to use factoring, the square root property, and the quadratic formula to solve quadratic equations.
- 2. Students will demonstrate the ability to use the discriminant and graphical representations to determine types of solutions for quadratic equations.
- 3. Students will demonstrate the ability to solve applications and model data involving quadratic equations.
- 4. Students will demonstrate the ability to determine maxima and minima of quadratic functions using a graphing calculator.
- 5. Students will demonstrate the ability to graph quadratic functions, to identify the vertex and axis of symmetry, and to convert between standard and vertex forms of a function.
- 6. Students will demonstrate the ability to solve quadratic inequalities graphically and symbolically.
- 7. Students will demonstrate the ability to use vertical and horizontal shifts and vertical stretching and shrinking in transformations of graphs.

<u>Topics</u>

Polynomial Functions and Models Rational Functions and Models

IV. Learning Outcomes

- 1. Students will demonstrate the ability to understand and interpret data from the graphs of polynomial functions.
- 2. Students will demonstrate the ability to identify the domain of a rational function.
- 3. Students will demonstrate the ability to determine vertical and horizontal asymptotes of the graphs of rational functions.

MATH 1710 Course Topics & Learning Outcomes

<u>Topics</u>

Combining Functions Inverse Functions and Their Representations Exponential Functions and Models Logarithmic Functions and Models Properties of Logarithms Exponential and Logarithmic Equations Functions and Equations of Two Variables

V. <u>Learning Outcomes</u>

- 1. Students will demonstrate the ability to perform arithmetic operations and compositions of functions using graphical, numeric, and symbolic representations.
- 2. Students will demonstrate the ability to identify one-to-one functions and find inverse functions symbolically.
- 3. Students will demonstrate the ability to determine the domains and ranges of inverse functions and to graph inverse functions and their line of symmetry.
- 4. Students will demonstrate the ability to distinguish between linear and exponential functions and to distinguish between exponential growth and decay.
- 5. Students will demonstrate the ability to calculate compound interest and to use exponential models to represent growth and decay.
- 6. Students will demonstrate the ability to calculate logarithms.
- 7. Students will demonstrate the ability to solve logarithmic and exponential equations.
- 8. Students will demonstrate the ability to apply basic properties of logarithms and to use the change of base formula.

<u>Topics</u>

Linear Systems of Equations and Inequalities in Two Variables Properties and Applications of Matrices Solutions of Linear systems Using Matrices Inverses of Matrices Determinants

VI. <u>Learning Outcomes</u>

- 1. Students will demonstrate the ability to solve systems of equations and inequalities graphically.
- 2. Students will demonstrate the ability to solve systems of linear equations by substitution and elimination.
- 3. Students will demonstrate the ability to determine dimensions of matrices and to determine if a matrix is in row-echelon form.
- 4. Students will demonstrate the ability to find sums, differences, and scalar multiples of matrices and to determine when matrices may be multiplied and to perform matrix multiplication.
- 5. Students will demonstrate the ability to represent systems of linear equations with matrices and to use matrices and technology to solve systems.
- 6. Students will demonstrate the ability to solve applications using systems of equations.
- 7. Students will demonstrate the ability to use technology to find inverses of matrices and to solve linear systems with inverses.

Topics

Counting Probability

VII. Learning Outcomes

- 1. Students will demonstrate the ability to apply the fundamental counting principle.
- 2. Students will demonstrate the ability to calculate and apply permutations and combinations.
- 3. Students will demonstrate the ability to calculate the probability of independent, dependent, and compound events.