### MAT 151 College Algebra, Standard

**Catalog Description:** Accelerated algebra that includes the topics: equations, functions, transformations, linear and quadratic functions and inequalities, systems of linear equations and inequalities, exponential and logarithmic functions, polynomials, rational functions, sequences and series.

**Credit Hours:** 4  
**Effective Term:** Fall 2010  
**Terms Offered:** All Terms  
**Teaching Methods:** Lecture  
**Modalities:** Face to Face Hybrid ITV Online  
**Prerequisite(s):** MAT121; RDG094  
**Corequisite(s):** None  
**Times for Credit:** 1  
**Grading Option:** A/F  
**Credit Breakdown:** 4 Lectures  
**Cross Listed:**  
**Learning Outcomes:**

1. (Knowledge) Identify the characteristics of a function and its inverse.

2. (Application) Sketch the graphs of various types of functions including linear, quadratic, polynomial, rational, radical, exponential and logarithmic.

3. (Application) Solve application problems modeled with functions.

4. (Application) Solve exponential and logarithmic equations.

5. (Application) Perform the arithmetic operations on complex numbers, functions and composite functions.

6. (Application) Solve systems of linear and nonlinear equations.
7. (Application) Solve systems of linear and nonlinear inequalities.

8. (Application) Find the partial fraction decomposition.

9. (Knowledge) Identify the characteristics of conic sections.

10. (Comprehension) Classify sequences and series.

11. (Evaluation) Evaluate arithmetic and geometric series.

12. (Application) Use technology to assist in solving problems.

**Standards/Assessments:**

1a. Find the domain and range of a relation.

1b. Determine if a relation is a function.

1c. Find the inverse of a one-to-one function.

2a. Given a function, use the transformation methods to sketch the graph and use a graphing calculator to verify the accuracy of the sketch.

2b. Given a polynomial function, use the Rational Zero Theorem to find the x-intercept and then sketch the graph.

3a. Use linear, quadratic and polynomial functions to model problems applying concepts of maximum/minimum values and zeros to find the solutions.

3b. Apply the concepts of exponential and logarithmic functions to solve problems involving compound interest and exponential growth and decay.

4a. Use appropriate properties of exponents and logarithms to solve exponential and logarithmic equations.

5a. Find the sum, difference, product and quotient of complex numbers and functions.
5b. Find the composition of two functions.

6a. Solve a system of linear equations in two and three variables using the substitution, elimination, Cramer’s rule, and the Gauss Jordan methods.

6b. Solve a system of nonlinear equations using the substitution method.

7a. Graph the solution set of a system of inequalities.

8a. Represent a fraction as a sum or difference of multiple fractions.

9a. Determine if the graph of an equation is a parabola, circle, ellipse or hyperbola.

9b. Given the equation of a parabola, state the vertex, focus, and directrix.

9c. Given the equation of an ellipse or hyperbola, state the center, foci, and vertices.

10a, 11a. Find the general term of an arithmetic or geometric sequence.

10b, 11b. Find the sum of an arithmetic or geometric sequence.

12a. Use a graphing calculator to sketch the graph of a polynomial and rational function, and identify the characteristics of the graph.

12b. Use a graphing calculator to find the value of a determinant of any size.

AGEC/Special Requirements: Mathematics AGEC

Campus: Statewide/District -DSP

Revised: 9/2009