MAT 111 – College Algebra with Applications
Course Credit: 3 semester hours

Course Description: This course covers algebra topics with a focus on practical applications involving linear, quadratic, and rational equations and inequalities, linear and quadratic functions, systems of equations, and exponential and logarithmic functions.

Rationale: Learning to think logically and precisely is an important outcome that is desired for all Mississippi College students. It is universally known that abstract thinking such as what is done in a mathematics course is very helpful in developing that ability. MAT 111 is designed to serve as a basic introduction to that process. The course also is designed to provide students with a number of practical ways that abstract thinking can be used to solve real-world problems. Further, various courses in many disciplines require College Algebra with Applications as a prerequisite and also counts toward completing the core curriculum

Prerequisites: MAT105 or ACT MAT subscore of 19 or better

Learning Objectives: Upon successful completion of this course the student will demonstrate an understanding of algebra techniques related to solving practical applications using the following:

- Solving linear, quadratic and rational equations and inequalities
- Understanding linear and quadratic functions and their graphs
- Solving linear and nonlinear systems of equations
- Understanding inverse functions, exponential and logarithmic functions and their graphs

Instructional Procedures/Techniques: The method of instruction may include lecture, group problem solving, individual problem solving, demonstrations, computer lab assignments, quizzes and examinations.

Outline of Topics:

Chapter R: (max 2 weeks) – This is considered a review of prerequisite material.

- Real numbers and absolute value
- Exponent rules
- Factoring with a focus on quadratics
- Simplifying radical and rational expressions

Chapter 1:

- Solving linear and quadratic equations and inequalities
- Mathematical Modeling
- Complex numbers
- Absolute Value equations and inequalities

Chapter 2:

- Graphing
- Functions and their graphs
- Function operations and composition

Chapter 3:

- Quadratic and higher degree models
- Synthetic division and zeros of polynomial functions
- Solving equations in higher degrees
- Rational functions
- Variation

Chapter 4:

- Inverse functions
- Exponential and logarithmic functions: as inverses of each other, solving and graphing, various bases (especially natural, common, and binary),
- Exploring exponential and logarithmic models

Chapter 5:

- Solving linear systems of equations by substitution and elimination
- Graphing linear systems
- Solution sets of inequalities

Materials Required: College Algebra, Lial, Hornsby, Schnieder, & Daniels, 13th ed

Attendance and Make-up tests: Any student whose absences, whether excused or unexcused, accumulate to 12 in semester classes meeting 3 times per week or 8 in semester classes meeting 2 times per week or 4 in semester classes meeting once a week automatically receives a grade of F in the course. The responsibility for missed work rests entirely with the student.

Academic Integrity: Students are expected to do their own work. Refer to the following website: www.mc.edu/publications/policies/219.html.