MTH 112
Precalculus Algebra

I. MTH 112 Precalculus Algebra - 3 Semester Hours

II. Course Description

This course emphasizes the algebra of functions – including polynomial, rational, exponential, and logarithmic functions. The course also covers systems of equations and inequalities, quadratic inequalities, and the binomial theorem. Additional topics may include matrices, Cramer’s Rule, and mathematical induction.

III. Prerequisite

A minimum prerequisite of high school Algebra I, Geometry, and Algebra II with an appropriate mathematics placement score. An alternative to this is that the student should successfully pass with a C or higher in Intermediate College Algebra.

IV. Textbook

Due to the varied selection of quality college level textbooks, each college will select the textbook needed to meet the requirements of this course.

V. Course Objectives

The objective of this course is to provide an understanding of concepts, develop competent skills, and demonstrate applications in the following areas:

1. analytic and geometric interpretation of algebraic, exponential, and logarithmic functions
2. analytic and geometric interpretation of systems of equations and inequalities

While building on the manipulative skills from algebra this course strives to develop analytic skills as a preparation for further mathematical applications or courses in mathematics requiring knowledge of algebraic and transcendental functions.
VI. **Course Outline of Topics**

A. This course shall include the following topics as a minimum.
   1. Cartesian plane
   2. Graphs of equations
   3. Lines in the plane
   4. Functions
   5. Graphs of functions
   6. Combinations of functions
   7. Inverse functions
   8. Variation
   9. Quadratic functions
   10. Higher degree functions
   11. Real zeros
   12. Complex numbers
   13. Fundamental Theorem of algebra
   14. Rational functions
   15. Partial fractions
   16. Exponential functions
   17. Logarithmic functions
   18. Properties of logarithms
   19. Solving exponential and logarithmic equations
   20. Applications
   21. Systems of equations
   22. Systems in two variables
   23. Systems of more than two variables
   24. Systems of inequalities
   25. Linear programming
   26. Quadratic inequalities
   27. Binomial Theorem

B. Optional topics may include the following
   1. Matrices and systems of equations
   2. Operations with matrices
   3. Inverse matrices
   4. Determinant of a matrix
   5. Properties of determinants
   6. Applications
   7. Sequences, summation notation
   8. Arithmetic sequence
   9. Geometric sequence
   10. Mathematical induction
VII. Evaluation and Assessment

Evaluation and assessment techniques may include any or all of the following.

- Exams
- Projects
- Homework
- Computer assignments
- Participation

Grades will be given based upon A = 90 – 100%, B = 80 – 89%, C = 70 – 79%, D = 60 – 69%, and F = below 60%.

VIII. Attendance

Students are expected to attend all classes for which they are registered. Students who are unable to attend class regularly, regardless of the reason or circumstance, should withdraw from that class before poor attendance interferes with the student’s ability to achieve the objectives required in the course. Withdrawal from class can affect eligibility for federal financial aid.

IX. Statement on Discrimination/Harassment

The College and the Alabama State Board of Education are committed to providing both employment and educational environments free of harassment or discrimination related to an individual’s race, color, gender, religion, national origin, age, or disability. Such harassment is a violation of State Board of Education policy. Any practice or behavior that constitutes harassment or discrimination will not be tolerated.

X. Americans with Disabilities

The Rehabilitation Act of 1973 (Section 504) and the Americans with Disabilities Act of 1990 state that qualified students with disabilities who meet the essential functions and academic requirements are entitled to reasonable accommodations. It is the student’s responsibility to provide appropriate disability documentation to the College.