SOUTHERN UNIVERSITY AND A&M COLLEGE
DEPARTMENT OF MATHEMATICS

MATH 135
PRE-CALCULUS MATHEMATICS I

Course Description: Topics include a review of the real numbers and their properties; operations with complex numbers; equations and inequalities; polynomial, rational, exponential and logarithmic functions and their graphs; and systems of equations and inequalities. Modeling is introduced and applications are emphasized. Designed for students in the business, scientific, or engineering programs. Graphing calculators are required.

Instructor's Emphasis: The instructor will emphasize problem solving, critical thinking and communicating, both orally and in writing. Emphasis will also be placed on the understanding of ideas. The meaning of concepts will be viewed in verbal, graphical and numerical terms. This course will provide students with the essential concepts and skills in precalculus which are needed to successfully complete a trigonometry course and a calculus course.

Intended Audience: This course is designed for students who are preparing to take Calculus, and for students who are majoring in a business, scientific, or engineering program.

Course Credit: 3 hours

Prerequisite: Placement

Textbook: *Algebra and Trigonometry*, Cynthia Young, Wiley 2007.
        Instructor may require the use of *WileyPlus* online homework management system.

General Goals:

1.   To provide the student with the skills of algebra and functions which are needed for further study in mathematics.

2.   To provide the student with the skills necessary to be able to give reasonable explanations, both orally and in writing, of algebraic concepts encountered;

3.   To provide the student with the critical thinking skills required to solve problems, routine and non-routine, and then check or verify their solution(s).

Learning Outcomes:

Upon exiting this course:

1.   Students will be able to demonstrate the ability to apply multiple strategies to solve various equations and inequalities algebraically and graphically.

2.   Students will be able to demonstrate the ability to graph relations in the real plane by adjusting the viewing screen and scale to identify information given on the graph.

3.   Students will be able to demonstrate understanding of functions by exploring their properties to create new functions, including compositions and inverses.

4. Students will be able to demonstrate the knowledge of various functions by constructing mathematical models from real world applications to conclude a reasonable solution.
5. Students will be able to demonstrate the ability to find the zeros of polynomial functions of degrees higher than two by applying the Remainder and the Factor theorems.

6. Students will be able to demonstrate the understanding of rational functions and asymptotes by analyzing the graph of a rational function and using algebraic skills.

7. Students will be able to demonstrate the skills necessary to solve systems of equations in two variables by using various methods to solve real world applications.

Assessment Measures:
1. Departmental comprehensive exam
2. Instructor created exams, quizzes, and homework

COURSE CONTENTS:

Chapter 1 Equations and Inequalities

1.1 Linear Equations
1.2 Applications Involving Linear Equations
1.3 Quadratic Equations
1.4 Radical Equations; Equations, Quadratic in Form
1.5 Linear Inequalities
1.6 Polynomial and Rational Inequalities
1.7 Absolute Value Equations and Inequalities

Chapter 2 Graphs

2.1 Cartesian Plane, Distance Formula, Midpoint Formula
2.2 Graphing Equations
2.3 Straight Lines

Chapter 3 Functions

3.1 Functions
3.2 Graphs of Functions: Library of Common Functions and Piecewise-Defined Functions
3.3 Graphing Techniques: Transformations
3.4 Operations on Functions and Composition of Functions
3.5 One-to-One Functions and Inverse Functions

Chapter 4 Polynomial and Rational Functions

4.1 Quadratic Functions
4.2 Polynomial Functions of Higher Degree
4.3 Dividing Polynomials: Long Division and Synthetic Division
4.4 Properties and Tests of Zeros of Polynomial Functions
4.5 Rational Functions
4.6 Modeling Using Variation

Chapter 5 Exponential and Logarithmic Functions

5.1 Exponential Functions and Their Graphs
5.2 Exponential Functions with Base e

5.3   Logarithmic Functions and Their Graphs
5.4   Properties of Logarithms
5.5   Exponential and Logarithmic Equations

Chapter 9 Systems of Equations and Inequalities

9.1   Systems of Linear Equations in Two Variables

COURSE EXPECTATIONS AND STUDENT SUPPLEMENTS

1. **EXPECTATIONS**
Students are expected to have the skills prerequisite for this course. Students are encouraged to use the computers in the Math Lab or other resources to review the prerequisite skills for this course.

2. **THE MATHEMATICS LABORATORY (MATH LAB)**
The MATH LAB is located in 318 T.T. Allain Hall. Each class will be scheduled at the beginning of the semester for orientation. The Laboratory will be open for general use at designated times. The Lab's hours of operation will be announced to each class and posted.

Laboratory resources that are designed to help the student to achieve the objectives of the course include:

    a) individual tutoring;
    b) computerized practice and tutoring; and
    c) internet access to online tutorials.

3. **OTHER RESOURCES that are designed to help the student** achieve the objectives of the course include:

    a) *WileyPlus* includes a complete online version of the text, algorithmically generated exercises, all of the text supplements, and course and homework management tools.

    b) Personal tutoring is available free of charge at the Center for Student Success in 107 Stewart Hall. Contact Dr. Jaquator Hamer Lawrence at 771 – 4312 for details.

4. **CLASS ATTENDANCE**
All students enrolled in Math 135 are expected to attend classes regularly and punctually. Excessive absences and tardiness will be noted. The student is responsible for keeping up with course work, whether or not an absence is excused.

5. **EXITING MATH 135**
To exit Math 135, the student must have a semester grade of "C" or higher. Those students who earn a grade of "D" or lower must retake and pass Math 135 before advancing to a higher level mathematics course.

Teachers will administer the EXAMINATION according to the time printed in the Class Schedule and Student Registration Bulletin.

NOTE: A graphing calculator may be required by individual instructor for course work. The instructor may use a designated calculator in class. All students are required to know how to use their own calculators.

ACADEMIC DISHONESTY: Adhere to honesty and integrity in work submitted for credit in this course and adheres to SUBR's Code of Conduct. (Refer to current Catalog.)

DISABILITY STATEMENT: Students that are considered as having a disability are to provide the professor with a letter from the Department of Special Education stating the   appropriate accommodations required of this course. If you have a documented disability, then please discuss it with personnel at 771-3950 in Room 125 of Blanks Hall.

SUGGESTED OR REQUIRED READING: See professor.

GRADING POLICY: See professor.