SOUTHERN UNIVERSITY and A&M COLLEGE
DEPARTMENT OF MATHEMATICS

MATH 130
COLLEGE MATHEMATICS I

CATALOG DESCRIPTION:

An introduction to problem-solving approaches, logic, the real number system; basic concepts of algebra including functions, graphs, systems of equations; and inequalities; geometry; and topics in contemporary mathematics. Designed for students needing a maximum of six hours of mathematics.

INSTRUCTORS"S EMPHASIS:

The instructor will emphasize problem solving techniques and ideas that require knowledge of linear functions, quadratic functions, real and rational numbers, and word problems involving these concepts, as well as word problems involving proportion. The concepts of factoring, the quadratic formula, and the rectangular coordinate system are covered. In addition, basic geometric concepts will be emphasized, such as lines, planes, angles, circles, and triangles. This course is not meant for science majors, but, along with Math 131, is meant to fulfill the University requirement for 6 hours of mathematics for many non-science majors.

PREREQUISITES:

A grade of "C" or higher in Mathematics 092 or completion of a high school degree.

INTENDED AUDIENCE:

This course is designed for students to fulfill the University requirement for 6 hours of mathematics. It is intended for non-science majors. The major purpose of this course is to provide students with the essential concepts and skills of trigonometry which are needed for further study in mathematics.

PROFESSOR:

OFFICE NO.:

OFFICE HOURS:

CREDIT HOURS: 3 HRS.

TEXTBOOK: Mathematical Ideas, Eleventh Edition, by Charles D. Miller, Vern E.Heeren, E. John Hornsby, Jr. ATTENTION: MYMATHLAB Computer Software should accompany textbook.

GENERAL GOALS:

1. Understands The Real Number System
2. Understands The Basic Concept of Algebra
3. Understands Functions and Graphs
4. Understands The Basic Concepts of Geometry

LEARNING OBJECTIVES

The students will develop an appreciation of mathematics, give reasonable explanations of mathematical concepts encountered; solve problems and then check and verify solutions. The student will use the new acquired knowledge to solve problems dealing with real-world situations. The student will:

A. Understands The Real Number System
   1. Identify the various types of numbers in the set of real numbers.
   2. Identify the properties of real numbers.
   3. Understand and apply the fundamental order of operations.
   4. Add, subtract, multiply, and divide rational numbers.
   5. Convert a rational number to decimal form and vice versa.
   6. Add, subtract, multiply and divide rational numbers in decimal form.
   7. Round decimal numbers to percent form and vice versa.
   8. Work problems involving percent.
   9. Simplify irrational numbers.
   10. Simplify complex numbers.

B. Understands The Basic Concepts of Algebra
   1. Solve linear equations and inequalities and apply the techniques to solve word problems.
   2. Translate verbal phrases into mathematical expressions.
   3. Solve problems involving ratio, proportion, and variation.
   4. Evaluate exponential expressions.
   5. Add, subtract, and multiply polynomials.
   6. Factor polynomials.
   7. Multiply and divide numbers that are expressed in scientific notation.
   8. Solve quadratic equations by the methods of: factoring, the square root property, and the quadratic formula.
   9. Use graphs, set-builder notation, and interval notation to specify an inequality.
   10. Solve compound and absolute value equations and inequalities.

C. Understands Functions and Graphs
   1. Sketch the graphs of linear equations.
   2. Develop an understanding of the concept of functions.
   3. Find and interpret the slope of a line.

4. Write the equations of lines passing through a given point with a given slope.

D. Understands The Basic Concepts of Geometry
   1. Symbolize lines, half-lines, rays, and line segments.
   2. Classify angles.
   3. Understands relationships between angles.
   4. Identify various types of curves and polygons.
   5. Find perimeter and area of plane figures.

LEARNING OUTCOMES:

1. Students will be able to demonstrate their knowledge of the various types of numbers in the real number system by giving examples and by locating them on the number line.

2. Students will be able to identify the properties of real numbers and use these properties to perform mathematical operations.

3. Students will be able to use the fundamental rules for the order of operations to simplify an expression.

4. Students will demonstrate their knowledge of real numbers by solving and constructing real world application problems.

5. Students will demonstrate the ability to apply multiple strategies to solve equations algebraically and graphically.

6. Students will demonstrate skills necessary to model and solve real world problems by using linear equations and proportions.

7. Students will demonstrate their ability to evaluate exponential expressions by utilizing the properties of exponents.

8. Students will demonstrate their understanding of factoring a polynomial by using trial and error and grouping.

9. Students will demonstrate the ability to find and interpret the slope of a line by visualizing everyday situations that involve slopes and using the slope formula to mathematically find the slope of a line.

COURSE CONTENTS:

UNIT I The Real Numbers and Their Representations
- 6.1 Real Numbers, Order, and Absolute Value
- 6.2 Operations, Properties, and Applications of Real Numbers
- 6.3 Rational Numbers and Decimal Representation
- 6.4 Square Roots (only)

6.5 Applications of Decimals and Percents

Unit II The Basic Concepts of Algebra
7.1 Linear Equations
7.2 Applications of Linear Equations
7.3 Ratio and Proportion (only)
7.4 Linear Inequalities
7.5 Properties of Exponents and Scientific Notation
7.6 Polynomials and Factoring
7.7 Quadratic Equations and Applications

UNIT III Graphs, Functions, and Systems of Equations and Inequalities
8.1 The Rectangular Coordinate System and Circles
8.2 Lines, Slope and Average Rate of Change
8.3 Equations of lines and Linear Models
8.4 An Introduction to Functions (optional)

UNIT IV Geometry
9.1 Points, Lines, Planes, and Angles
9.2 Curves, Polygons, and Circles
9.3 Perimeter, Area, and Circumference
9.5 Space Figures, Volume and Surface Area

INSTRUCTIONAL TECHNIQUES:

1. Lecture
2. Inquiry (Questioning, Discussion)
3. Demonstration
    a. Board
    b. Calculator (scientific)
    c. Computer (math lab)
    d. MYMATHLAB Computer Software

SPECIFIC REQUIREMENTS:

1. Academic
    a. Written assignments from the exercises in textbook.
    b. Solve problems at the board.
    c. Quizzes and tests
    d. Reading and writing assignments on mathematics related topics.
    e. Final Examination.

2. Administrative
   All students enrolled in Math 130 are expected to attend classes regularly and punctually. Excessive absences and tardiness will not be tolerated. The student is responsible for keeping up with course work, whether or not an absence is excused.

a. When a student receives three (3) absences in Math 130, his/her academic standing in the course will be compromised.
b. Extenuating circumstances surrounding tardiness and absences will be handled by individual case.

STUDENT SUPPLEMENT:

The Math Lab is located in 318 T.T. Allain Hall. The laboratory will be open for general use from 8:00 a.m. until 8:00 p.m. Monday through Thursday and 8:00 a.m. until 5:00 p.m. on Friday. The testing hours will be 9:00 a.m. – 11:00 a.m. Monday through Thursday, 1:00 p.m. – 7:00 p.m. Monday through Thursday and 9:00 a.m. – 11:00 a.m. on Friday.

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

1. tutoring by using a computer;
2. computerized practice and sample tests that help students to prepare for unit tests, and the final examination

MyMathLab Software

This software provides diagnostic testing and tutorial help online using MyMathLab Tutorial Software. Students can take practice chapter tests correlated to the textbook, receive individualized study plans based on these test results, work practice problems for areas in which they need improvement, receive tutorial instruction in those topics, and take further test to gauge their progress.

EVALUATION:

1. The appraisal of the course and course outcomes will be based on the effectiveness of the course in meeting the needs of those students who will do further study in mathematics and the ability of each student to internalize concepts and skills and demonstrate a minimum 70% competency.
2. Instruments of evaluation will include: Quizzes, tests, assignments, and the final examination.
3. Grading Policy will be given by the professor.

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.