



Alabama Community College System

MTH 098

Elementary Algebra

Plan of Instruction

COURSE DESCRIPTION: This course provides a study of the fundamentals of algebra. Topics include the real number system, linear equations and inequalities, graphing linear equations and inequalities in two variables and systems of equations. This course does not apply toward the general core requirement for mathematics.

CREDIT HOURS

- Theory Credit Hours 4 hours
- Lab Credit Hours 0 hours
- Total Credit Hours 4 hours

NOTE: Theory credit hours are a 1:1 contact to credit ratio. Colleges may schedule lab hours as 3:1 and/or 2:1 contact to credit ratio. Clinical hours are 3:1 contact to credit ratio. (Ref Board Policy 705.01)

PREREQUISITE COURSES

None.

CO-REQUISITE COURSES

None.

COMPETENCIES

- Solve mathematical problems involving real numbers.
- Solve problems involving linear equations and inequalities in one variable.
- Solve a variety of problems related to graphing and writing linear equations in two variables.
- Solve systems of equations in two variables using a variety of methods.

INSTRUCTIONAL GOALS

- **Cognitive** – Comprehend principles and concepts related to elementary algebra.
- **Psychomotor** – There are no psychomotor goals associated with this course.
- **Affective** – There are no affective goals associated with this course.

Condition Statement: Topics in the modules in this course represent minimal expectations for students. Unless otherwise indicated, evaluation of student's attainment of objectives is based on knowledge gained from this course. The modules do not have to be taught in the order presented in this outline.

STUDENT LEARNING OUTCOMES

MODULE A – Real Number System	
COMPETENCY A1 - Solve mathematical problems involving real numbers.	
LEARNING OBJECTIVES	KSA Indicators
A1.1 Define terms associated with algebra.	1
A1.2 Perform operations on signed real numbers.	2
A1.3 Apply the properties of real numbers.	2
A1.4 Evaluate and simplify algebraic expressions.	2
A1.5 Translate word phrases into algebraic expressions.	2
A1.6 Solve application problems involving operations with real numbers	3
MODULE A OUTLINE	
<ul style="list-style-type: none"> • Review of terms and definitions <ul style="list-style-type: none"> - Constant - Variable - Coefficient - Expression - Formula - Exponents - Real Numbers • Operations on signed real numbers <ul style="list-style-type: none"> - Integers - Fractions - Decimals - Absolute values - Exponents • Order of operations • Real numbers and their properties <ul style="list-style-type: none"> - Commutative - Associative - Distributive - Identity - Inverse • Algebraic expressions <ul style="list-style-type: none"> - Evaluating - Simplifying - Translating • Applications 	

MODULE B – Linear Equations And Inequalities In One Variable	
COMPETENCY B1 - Solve problems involving linear equations and inequalities in one variable.	
LEARNING OBJECTIVES	KSA Indicators
B1.1 Solve linear equations and inequalities involving one step.	2
B1.2 Solve linear equations and inequalities involving multiple steps.	2
B1.3 Solve literal equations for a specified variable.	2
B1.4 Express the solution set of a linear inequality in interval notation.	2
B1.5 Graph solutions of inequalities.	2
B1.6 Solve compound inequalities.	2
B1.7 Solve application problems involving linear equations and inequalities.	3
MODULE B OUTLINE	
<ul style="list-style-type: none"> • Solving equations and inequalities <ul style="list-style-type: none"> - One step - Multiple steps - Literal equations • Interval Notation • Graphing Inequalities • Compound inequalities • Applications 	

MODULE C –Graphing Linear Equations And Inequalities In Two Variables	
COMPETENCY C1 – Solve a variety of problems related to graphing and writing linear equations in two variables.	
LEARNING OBJECTIVES	KSA Indicators
C1.1 Graph ordered pairs on a rectangular coordinate system.	1
C1.2 Identify solutions to linear equations in two variables.	2
C1.3 Identify x and y intercepts and the slope of a line.	2
C1.4 Calculate the slope of a line.	3
C1.5 Identify the slope and equation of horizontal and vertical lines.	3
C1.6 Determine if two or more lines are parallel, perpendicular or neither.	3
C1.7 Graph linear equations in two variables using a variety of methods.	3
C1.8 Write the equation of a line given its slope and a point on the line.	3
C1.9 Graph linear inequalities in two variables.	3
MODULE C OUTLINE	
<ul style="list-style-type: none"> • Ordered Pairs <ul style="list-style-type: none"> - Identify - Graph - As solutions • Lines <ul style="list-style-type: none"> - x and y intercepts - Slope - Parallel and Perpendicular • Graphing Lines <ul style="list-style-type: none"> - Table of values - x and y intercepts - Slope and y-intercept • Forms of a Line <ul style="list-style-type: none"> - Standard Form - Horizontal and Vertical Lines - Slope-Intercept Form - Point-Slope Form • Writing the Equation of a Line <ul style="list-style-type: none"> - Slope and a Point - Two Points • Graphing Linear Inequalities 	

MODULE D – Systems of Linear Equations in Two Variables	
COMPETENCY D1 – Solve systems of equations in two variables using a variety of methods.	
LEARNING OBJECTIVES	KSA Indicators
D1.1 Solve a system of linear equations using the graphing method.	3
D1.2 Solve a system of linear equations using the substitution method.	3
D1.3 Solve a system of linear equations using the elimination method.	3
D1.4 Solve applications of problems involving systems of linear equations.	3
D1.5 Solve a system of linear inequalities using the graphing method.	3
MODULE D OUTLINE	
<ul style="list-style-type: none"> • Graphing • Substitution • Elimination • Applications 	

LEARNING OUTCOMES TABLE OF SPECIFICATIONS

The table below identifies the percentage of learning objectives for each module. **Instructors should develop sufficient numbers of test items at the appropriate level of evaluation.**

	Limited Knowledge and Proficiency	Moderate Knowledge and Proficiency	Advanced Knowledge and Proficiency	Superior Knowledge and Proficiency
KSA	1	2	3	4
Module A	17%	66%	17%	
Module B		86%	14%	
Module C	11%	22%	67%	
Module D			100%	

Learner's Knowledge, Skills and Abilities		
Indicator	Key Terms	Description
1	Limited Knowledge and Proficiency	<ul style="list-style-type: none"> Recognize basic information about the subject including terms and nomenclature. Students must demonstrate ability to recall information such as facts, terminology or rules related to information previously taught. Performs simple parts of the competency. Student requires close supervision when performing the competency.
2	Moderate Knowledge and Proficiency	<ul style="list-style-type: none"> Distinguish relationships between general principles and facts. Adopts prescribed methodologies and concepts. Students must demonstrate understanding of multiple facts and principles and their relationships, and differentiate between elements of information. Students state ideal sequence for performing task. Performs most parts of the competency with instructor assistance as appropriate.
3	Advanced Knowledge and Proficiency	<ul style="list-style-type: none"> Examines conditions, findings, or other relevant data to select an appropriate response. The ability to determine why and when a particular response is appropriate and predict anticipated outcomes. Students demonstrate their ability to seek additional information and incorporate new findings into the conclusion and justify their answers. Performs all parts of the competency without instructor assistance.
4	Superior Knowledge and Proficiency	<ul style="list-style-type: none"> Assessing conditions, findings, data, and relevant theory to formulate appropriate responses and develop procedures for situation resolution. Involves higher levels of cognitive reasoning. Requires students to formulate connections between relevant ideas and observations. Students apply judgments to the value of alternatives and select the most appropriate response. Can instruct others how to do the competency. Performs competency quickly and accurately.
A	Affective Objective	<ul style="list-style-type: none"> Describes learning objectives that emphasize a feeling tone, an emotion, or a degree of acceptance or rejection. Objectives vary from simple attention to selected phenomena to complex but internally consistent qualities of character and conscience. Expressed as interests, attitudes, appreciations, values, and emotional sets or biases.