COURSE SYLLABUS

Tunxis Community College

Education That Works For a Lifetime

Course Title:	Pre-Algebra and Elementary Algebra	**Date submitted:**	1/30/14 (AAC: 14-13)
Department:	Mathematics/Science		
Curriculum:	Mathematics		

Course Descriptors: Make certain that the course descriptors are consistent with college and Board of Trustees policies, and the current course numbering system.

Course Code: (eg. ACC 101)	MAT*085
Course Type:	D/L

A: Clinical B: Lab D: Distance Learning
I: Individual/Independent L: Lecture N: Internship
M: Seminar P: Practicum U: Studio
X: Combined Lecture/Lab Y: Combined Lecture/ Clinical/Lab Z: Combined Lecture/Studio

Elective Type:	N/A

AH: Art History E: English FA: Fine Arts G: General
HI: History HU: Humanities LA: Liberal Arts
FL: Foreign Language M: Math S: Science
SS: Social Science

Credit Hours:	6
Developmental: (yes/no)	yes
Contact Hours: Lecture:	3
Clinical:	0
Lab:	3
Studio	0
Other:	0
TOTAL:	6
Class Maximum:	24
Semesters Offered:	F/SP/Su

Prerequisites:

None

Corequisites:

None

Other Requirements:

None

Catalog Course Description:

Intended to take students from Pre-algebra through the end of Elementary Algebra in one semester. The topics covered will be the same as those covered in Elementary Algebra with additional support provided to review topics from Pre-algebra as they are needed. The students will spend 3 hours in the classroom and 3 hours in a lab environment.

Topical Outline: List course content in outline format.

1. Four operations on the Real numbers and order of operations
2. Solving linear equations and inequalities in one variable, solving related formulas and application problems
3. Graphing linear equations and inequalities in two variables; formulating equations of lines in two variables; related applications
4. Using function notation, evaluating functions and using functions to model linear relationships
5. Rules of integer Exponents; Operations on polynomials
6. Solving systems of two linear Equations in two unknowns and related applications

Outcomes: Describe measurable

Upon successful completion of this course, the student will be able to do the following:

skills or knowledge that students should be able to demonstrate as evidence that they have mastered the course content.

Rational Numbers:

1. identify and distinguish between rational and irrational numbers
2. use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2, $\sqrt{8}$)

Expressions and Equations with Polynomials, Rational and Radical Expressions, and Integer Exponents:

1. interpret parts of an expression, such as terms, factors, and coefficients and evaluate expressions for a given replacement value(s)
2. add, subtract, and multiply polynomials. Divide polynomials by a monomial
3. construct and interpret equations as two expressions set equal to each other
4. manipulate formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's Law $V = IR$ to highlight resistance R
5. know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = \frac{1}{3^3} = \frac{1}{27}$)
6. use square root symbols to represent solutions to equations of the form $x^2 = p$, where p is a positive rational number
7. evaluate square roots of perfect squares
8. know that numbers such as $\sqrt{2}$ are irrational
9. express very large or very small quantities in scientific notation
10. perform operations with numbers expressed in scientific notation

Linear Equations in One Variable:

1. solve linear equations and inequalities in one variable
2. solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms
3. create linear equations and inequalities in one variable and use them to solve real world applications
4. recognize examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions

Linear Equations in Two Variables:

1. interpret the rate and unit rate as the slope of the graph
2. derive the equation $y = mx + b$ for a line intercepting the vertical axis at b *and having a slope of* m
3. iIdentify parallel and perpendicular lines based on their slopes
4. graph a linear equation in two variables
5. construct a linear equation to model a linear relationship between two quantities. Determine and interpret the rate of change and initial value from a description of a relationship or from two (x, y) values, including reading these from a table or graph
6. construct linear equations given a graph, a description of a relationship, or two input-output pairs (include reading these from a table) using point-slope form and slope-intercept form

Systems of Linear Equations:

1. understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs
2. solve systems of two linear equations in two variables algebraically (using both substitution and addition methods), graphically (by hand and/or technology), Solve simple cases by inspection. *For example,* $3x + 2y = 5$ *and* $3x + 2y = 6$ *have no solution because* $3x + 2y$ *cannot simultaneously be* 5 *and* 6
3. recognize systems of linear equations with one solution, infinitely many solutions, or no solutions
4. solve real-world problems leading to two linear equations in two variables

Functions:

1. understand that a function is a rule that assigns to each input exactly one output and that the graph of a function is the set of ordered pairs consisting of an input and the corresponding output
2. interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line
3. use functions to model linear relationships between quantities
4. use function notation. Evaluate functions for inputs in their domains
5. graph linear functions and show intercepts
6. recognize that linear functions have a constant rate of change and interpret the rate of change in the context of the problem

Applications:

1. apply geometrical formulas for two and three-dimensional figures such as rectangles, circles, rectangular solids, cylinders, spheres, etc.
2. apply the Pythagorean Theorem to determine unknown side lengths in right

	triangles in real-world and mathematical problems in two dimensions
	PROGRAM: *does not apply*
	GENERAL EDUCATION: *(Numbering reflects General Education Outcomes as they appear in the college catalog)*
Evaluation: List how the above outcomes will be assessed.	**Assessment will be based on the following criteria:** 1. Quizzes 2. Tests 3. Labs 4. Departmental Final exam (required for all sections)
Instructional Resources: List library (e.g. books, journals, on-line resources), technological (e.g. Smartboard, software), and other resources (e.g. equipment, supplies, facilities) required and desired to teach this course.	**Required:** Lab classroom for three hours a week, access to MyMathLab, large amount of board space and individual desks, and a supplemental instructor for the lab portion. **Desired:**
Textbook(s)	*Elementary and Intermediate Algebra: Graphs and Models*, by Bittinger, Ellenbogen, and Johnson, current edition