

# COURSE SYLLABUS

Tunxis  
Community  
College



*Education That Works For a Lifetime*

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| <b>Course Title:</b>  | Algebra Review  |                                      | <b>Date submitted:</b><br><br><br>3/14/14<br>(ACC: 14-35) |  |
| <b>Department:</b>  | Mathematics/Science   |                                      |   |  |
| <b>Curriculum:</b>  | Mathematics   |                                      |   |  |
| <b>Course Descriptors:</b><br>Make certain that the course descriptors are consistent with college and Board of Trustees policies, and the current course numbering system. | <b>Course Code:</b> (eg. ACC 101)   | MAT*070                              | <b>Prerequisites:</b><br><br><br>None                     |  |
|   | <b>Course Type:</b>   | X                                    |   |  |
|   | A: Clinical   B: Lab   D: Distance Learning<br>I: Individual/Independent   L: Lecture   N: Internship<br>M: Seminar   P: Practicum   U: Studio<br>X: Combined Lecture/Lab   Y: Combined Lecture/<br>Clinical/Lab   Z: Combined Lecture/Studio   |                                      |   |  |
|   | <b>Elective Type:</b>   | N/A                                  |   |  |
|   | AH: Art History   E: English   FA: Fine Arts   FL: Foreign Language   G: General   HI: History   HU: Humanities<br>LAS: Liberal Arts & Sciences   M: Math   S: Science<br>SS: Social Science  |                                      |   |  |
|   | <b>Credit Hours:</b>  | 1                                    |   |  |
|   | <b>Developmental:</b> (yes/no)  | yes                                  |   |  |
|   | Lecture:  | .5                                   |   |  |
|   | Clinical:   | 0                                    |   |  |
|   | <b>Contact Hours:</b>   | Lab: .5<br>Studio: 0<br>Other: 0     |   |  |
| <b>Class Maximum:</b>   | 24  | <b>Corequisites:</b><br><br><br>None |   |  |
| <b>Semesters Offered:</b>   | S   |                                      |   |  |
| <b>Ability Based Education (ABE) Statement</b>  | At Tunxis Community College students are assessed on the knowledge and skills they have learned. The faculty identified the General Education Abilities critical to students' success in their professional and personal lives. In every class, students are assessed on course abilities, sometimes program abilities, and, in most classes, at least one General Education Ability. Students will receive an evaluation of the degree to which they have demonstrated or not demonstrated that General Education Ability. |                                      |   |  |
| <b>Catalog Course Description:</b>  | A review course designed to allow students to build a better foundation and possibly place into a higher level mathematics course. Students will take a diagnostic test which will allow the course to be tailored to the individual student. Each student will need to purchase a MyFoundationsLab code and will be working at their own pace with the help of an instructor. At the end of the course, students may retake the placement test to place into a higher level mathematics class.                             |                                      |   |  |
| <b>Topical Outline:</b><br>List course content in outline format.   | <ol style="list-style-type: none"> <li>Four operations on the Real numbers and order of operations</li> <li>Solving linear equations and inequalities in one variable, solving related formulas and application problems</li> <li>Graphing linear equations and inequalities in two variables; formulating equations of lines in two variables; related applications</li> </ol>   |                                      |   |  |

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|   | 4. Using function notation, evaluating functions and using functions to model linear relationships<br>5. Rules of integer Exponents; Operations on polynomials<br>6. Solving systems of two linear equations in two unknowns and related applications   |
| <b>Outcomes:</b><br>Describe measurable skills or knowledge that students should be able to demonstrate as evidence that they have mastered the course content. | <p><b>Upon successful completion of this course, the student will be able to do some or all of the following: (Since students enter and exit at different levels)</b></p> <p><b>Rational Numbers:</b></p> <ol style="list-style-type: none"> <li>1. identify and distinguish between rational and irrational numbers</li> <li>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., <math>\pi^2</math>, <math>\sqrt{8}</math>)</li> </ol> <p><b>Expressions and Equations with Polynomials, Rational and Radical Expressions, and Integer Exponents:</b></p> <ol style="list-style-type: none"> <li>1. interpret parts of an expression, such as terms, factors, and coefficients and evaluate expressions for a given replacement value(s)</li> <li>2. add, subtract, and multiply polynomials. Divide polynomials by a monomial</li> <li>3. construct and interpret equations as two expressions set equal to each other</li> <li>4. manipulate formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's Law <math>V = IR</math> to highlight resistance <math>R</math></li> <li>5. know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, <math>3^2 \times 3^{-5} = 3^{-3} = \frac{1}{3^3} = \frac{1}{27}</math>)</li> <li>6. use square root symbols to represent solutions to equations of the form <math>x^2 = p</math>, where <math>p</math> is a positive rational number</li> <li>7. evaluate square roots of perfect squares</li> <li>8. know that numbers such as <math>\sqrt{2}</math> are irrational</li> <li>9. express very large or very small quantities in scientific notation</li> <li>10. perform operations with numbers expressed in scientific notation</li> </ol> <p><b>Linear Equations in One Variable:</b></p> <ol style="list-style-type: none"> <li>1. solve linear equations and inequalities in one variable</li> <li>2. solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms</li> <li>3. create linear equations and inequalities in one variable and use them to solve real world applications</li> <li>4. recognize examples of linear equations in one variable with one solution,</li> </ol> |

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. identify 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

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|  | <p><b>Applications:</b></p> <ol style="list-style-type: none"> <li>1. apply geometrical formulas for two and three-dimensional figures such as rectangles, circles, rectangular solids, cylinders, spheres, etc.</li> <li>2. apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two dimensions</li> </ol> <p><b>PROGRAM:</b> <i>does not apply</i></p> <p><b>GENERAL EDUCATION:</b> (<i>Numbering reflects General Education Outcomes as they appear in the college catalog</i>)</p> <p>The outcomes for this developmental course contribute to the foundation needed for eventual success in the following:</p> <p>7. <b>Quantitative Reasoning</b> -Students will learn to recognize, understand, and use the quantitative elements they encounter in various aspects of their lives. Students will develop a habit of mind that uses quantitative skills to solve problems and make informed decisions.</p> <p><b>Demonstrates:</b> Interprets numerical information and applies sufficient laws of logic and mathematics to solve problems using numbers, symbols, graphs and/or descriptions.</p> <p><b>Does Not Demonstrate:</b> Misinterprets numerical information or insufficiently applies laws of logic and mathematics to solve problems using numbers, symbols, graphs and/or descriptions.</p> |
| <p><b>Evaluation:</b><br/>List how the above outcomes will be assessed.</p>  | <p><b>Assessment will be based on the following criteria:</b></p> <ol style="list-style-type: none"> <li>1. Homework</li> <li>2. Quizzes</li> <li>3. Tests</li> </ol> <p>All to be completed in MyFoundationsLab</p>   |
| <p><b>Instructional Resources:</b><br/>List library (e.g. books, journals, online resources), technological (e.g. Smartboard, software), and other resources (e.g. equipment, supplies, facilities) required and desired to teach this course.</p> | <p><b>Required:</b> Lab classroom with 24 student stations, access to MyFoundationsLab.</p> <p><b>Desired:</b> Tutor and/or Supplemental Instructor</p>  |
| <p><b>Textbook(s)</b></p>  | <p>No Textbook required but students will need to purchase a MyFoundationsLab access code</p>  |