



El Camino College

COURSE OUTLINE OF RECORD - Official

I. GENERAL COURSE INFORMATION

Subject and Number: Mathematics 47A
Descriptive Title: Math Academy - Elementary Algebra

Course Disciplines: Mathematics

Division: Mathematical Sciences

Catalog Description: This elementary algebra course is the study of real number solutions and applications of linear equations, quadratic equations, linear inequalities, and systems of linear equations. Other topics include coordinate graphing or linear equations, factoring techniques, and simplification of rational and radical expressions.

Note: This course is designed for students who passed Mathematics 23 or who placed into Mathematics 40. This course is repeatable and open for enrollment at registration and at any time during the semester.

Conditions of Enrollment: Prerequisite

Mathematics 23
with a minimum grade of C
or

qualification by testing (El Camino College Mathematics Placement Test) and assessment
or

Recommended Preparation

Human Development 101
or concurrent enrollment

Course Length: Full Term Other (Specify number of weeks): 6
Hours Lecture: 7.00 hours per week TBA
Hours Laboratory: 1.00 hours per week TBA
Course Units: 0

Grading Method: No Grade
Credit Status: Non Credit

Transfer CSU: No
Transfer UC: No

General Education:

El Camino College:

CSU GE:

IGETC:

II. OUTCOMES AND OBJECTIVES

A. COURSE STUDENT LEARNING OUTCOMES (The course student learning outcomes are listed below, along with a representative assessment method for each. Student learning outcomes are not subject to review, revision or approval by the College Curriculum Committee)

1. On a test in Elementary Algebra, Intermediate Algebra, or Geometry, where the student is given information on the lengths of two sides of a right triangle, the student will be able to correctly determine the third side using the Pythagorean Theorem and write the solution in simplest exact form.
2. Given a linear equation of the form $y=mx+b$, where m is a rational and b is an integer, student will identify slope and y-intercept and use slope and y-intercept to graph line on grid that is provided.
3. Given a linear equation of the form $ax+by=c$, where a , b , and c are co-multiple integers, student will identify x-intercept and y-intercept and use x-intercept and y-intercept to graph the line on given grid.

The above SLOs were the most recent available SLOs at the time of course review. For the most current SLO statements, visit the El Camino College SLO webpage at <http://www.elcamino.edu/academics/slo/>.

B. Course Student Learning Objectives (The major learning objective for students enrolled in this course are listed below, along with a representative assessment method for each)

1. Use the properties of the real numbers to evaluate, simplify, and factor algebraic expressions, including expressions with fractions and radicals.
Quizzes
2. Solve linear equations and inequalities, systems of two linear equations with two variables, and quadratic equations.
Written homework
3. Set up and solve application problems using linear equations and inequalities, systems of two linear equations with two variables, and quadratic equations.
Objective Exams
4. Graph linear equations and systems of linear equations by plotting points or by using intercepts and the slope.
Class Performance
5. Carry out numerical operations and manipulate algebraic expressions, including expressions with rational and negative exponents, and complex numbers.
Written homework
6. Solve a variety of equations and inequalities, as well as systems of equations and inequalities, using algebraic and graphical methods. Types of equations include linear, quadratic, polynomial, rational, radical, and exponential.
Quizzes

III. OUTLINE OF SUBJECT MATTER (Topics are detailed enough to enable a qualified instructor to determine the major areas that should be covered as well as ensure consistency from instructor to instructor and semester to semester.)

Lecture or Lab	Approximate Hours	Topic Number	Major Topic
Lecture	14	I	<p>BASIC OPERATIONS AND MANIPULATIONS WITH ALGEBRAIC EXPRESSIONS</p> <ul style="list-style-type: none"> A. Evaluation of algebraic expressions using order of operations B. Identification of constants, variables, terms, variable terms, the degree of a variable term, the coefficient of a variable term in an algebraic expression C. Identify monomials, binomials and trinomials. D. Arithmetic operations on polynomials, including long division and use of integer exponents E. Simplification of algebraic expressions with the appropriate use of the commutative, associative, and distributive properties of real numbers F. Factoring polynomials (including those with common monomial factors, the difference of squares and perfect square trinomials) G. Factoring simple and general trinomials by grouping in simple and general trinomials H. Operations on rational expressions I. Operations on radical expressions
Lab	2	II	<p>Math Lab - Operations & Applications for:</p> <ul style="list-style-type: none"> A. Basic Operations B. Manipulations with Algebraic Expressions
Lecture	11	III	<p>EQUATIONS AND INEQUALITIES</p> <ul style="list-style-type: none"> A. Identify and simplify linear expressions. Solve linear equations and inequalities. B. Using the properties of equality, identify equivalent equations, solve linear equations and inequalities. C. Solve 2-by-2 linear systems of equations using substitution or linear combinations (also known as elimination or addition). D. Solve for a specified variable in an equation containing more than one variable. E. Solve quadratic equations using factoring, the square root property, completing the square, or the quadratic formula.
Lab	2	IV	<p>Math Lab - Operations & Applications for:</p> <ul style="list-style-type: none"> A. Equations B. Inequalities
Lecture	5	V	<p>APPLICATIONS</p> <ul style="list-style-type: none"> A. Translate a given English expression or a word problem into a mathematical expression, equation, or inequality. B. Set up and solve geometric problems using formulas for perimeter, area, volume, and the Pythagorean Theorem. C. Set up and solve a variety of application problems including those involving percentage relationships and ratio and

			proportions. Examples should include "work," "distance," and "mixture" problems.
Lab	1	VI	Math Lab - Operations & Applications for: A. Translate application to Mathematical expression B. Set up and solve application with Perimeter, Area, Volume, and Pythagorean Thm C. Ratio and Proportion
Lecture	8	VII	IV. GRAPHING A. Graph ordered pairs on a coordinate plane. B. Graph the solution of a linear inequality in one variable on a number line. C. Determine the slope of a line given its graph or given two points on the line. D. Graph linear equations in standard, slope-intercept and point slope form. E. Write the equation of a line given: a) a point and its slope, b) its slope and y-intercept, or c) two points on the line. F. Solve a 2-by-2 linear system of equations by graphing.
Lab	1	VIII	Math Lab - Operations & Applications for: A. Graphing B. Solving 2-by-2 linear system of equation by graphing
Lecture	4	IX	V FUNCTIONS: A. Definitions of function, domain and range B. Function notation C. Functions as rules, as sets of ordered pairs, as algebraic equations, and as graphs. Function types include polynomial, power, rational, radical, exponential, logarithmic and the absolute value D. Operations on functions, including addition, subtraction, multiplication, division, exponentiation and composition E. One-to-one functions
Total Lecture Hours		42	
Total Laboratory Hours		6	
Total Hours		48	

IV. PRIMARY METHOD OF EVALUATION AND SAMPLE ASSIGNMENTS

A. PRIMARY METHOD OF EVALUATION:

Problem solving demonstrations (computational or non-computational)

B. TYPICAL ASSIGNMENT USING PRIMARY METHOD OF EVALUATION:

A 13 foot ladder is placed against a building so that the distance from the top of the ladder to the ground is 7 feet more than the distance from the bottom of the

ladder to the building. Set up and solve a quadratic equation to determine both the distance from the bottom of the ladder to the base of the building and the distance from the top of the ladder to the ground.

C. COLLEGE-LEVEL CRITICAL THINKING ASSIGNMENTS:

1. Selling Vehicles: A firm sells cars and trucks. There is room on its lot for 260 vehicles. They know that profits are greatest if there are 90 more cars than trucks on the lot. How many of each vehicle should the firm have on the lot for the greatest profit? Show enough work to support your answer.
2. Octane Ratings: The octane rating of a gasoline is a percent measure of the amount of iso-octane in the gas. How much 87-octane gas and 93-octane gas should be blended in order to make 12 gallons of 91-octane gas? Show enough work to support your answer.

D. OTHER TYPICAL ASSESSMENT AND EVALUATION METHODS:

Class Performance

Homework Problems

V. INSTRUCTIONAL METHODS

Demonstration

Discussion

Group Activities

Laboratory

Lecture

Note: In compliance with Board Policies 1600 and 3410, Title 5 California Code of Regulations, the Rehabilitation Act of 1973, and Sections 504 and 508 of the Americans with Disabilities Act, instruction delivery shall provide access, full inclusion, and effective communication for students with disabilities.

VI. WORK OUTSIDE OF CLASS

Study

Answer questions

Skill practice

Problem solving activities

Estimated Independent Study Hours per Week: 0

VII. TEXTS AND MATERIALS

A. UP-TO-DATE REPRESENTATIVE TEXTBOOKS

Bittinger and Ellenbogen. Elementary Algebra: Concepts and Application. 9th ed. Pearson, 2012.

B. ALTERNATIVE TEXTBOOKS**C. REQUIRED SUPPLEMENTARY READINGS****D. OTHER REQUIRED MATERIALS**

1. Two inches of three ring binder, one 120 pages notebook, 8 colors dividers, a pack of index cards, highlighters, pencils, and pens.

VIII. CONDITIONS OF ENROLLMENT**A. Requisites (Course and Non-Course Prerequisites and Corequisites)**

Requisites	Category and Justification
Course Prerequisite Mathematics-23 or	Sequential
Non-Course Prerequisite or	Qualify by testing into Math 40. This course will bridges the gap between arithmetic and formal algebra.

B. Requisite Skills

Requisite Skills
1.Perform various operations (addition, subtraction, multiplication, division, and exponentiation) on different sets of numbers (whole, integer, and rational) and recognize equivalence when it occurs, particularly with fractions, decimals and percents. 2.Formulate mathematical representations of real-world applications including the recognition of proportional relationships. 3.Estimate to determine the reasonableness of results. 4.Recognize and apply the concepts of variable, expression, and equation. 5.Solve linear equations. 6.Find perimeters, areas, and volumes of various geometrical shapes and use in applications. 7.Use the properties of the real numbers to evaluate, simplify, and factor algebraic expressions, including expressions with fractions and radicals.

C. Recommended Preparations (Course and Non-Course)

Recommended Preparation	Category and Justification
Course Recommended Preparation Human Development-101	

D. Recommended Skills

Recommended Skills
Develop educational goals. HDEV 101 - Assess and develop personal, educational, and professional goals. HDEV 101 - Evaluate the components necessary to create an individual educational plan.

E. Enrollment Limitations

Enrollment Limitations and Category	Enrollment Limitations Impact

Course created by Malinni Roeun on 09/11/2015.

BOARD APPROVAL DATE: 01/20/2016

LAST BOARD APPROVAL DATE:

Last Reviewed and/or Revised by Malinni Roeun on 09/11/2015

