



# El Camino College

## COURSE OUTLINE OF RECORD - Official

### I. GENERAL COURSE INFORMATION

**Subject and Number:** Mathematics 27A  
**Descriptive Title:** Math Academy: Pre-Algebra

**Course Disciplines:** Mathematics

**Division:** Mathematical Sciences

**Catalog Description:** This course bridges the gap between arithmetic and formal algebra, developing number sense and operation sense, in order to formulate and solve algebraic equations with integers, fractions, and percent. Algebraic principles are applied to problems from a variety of fields. Other topics include proportional reasoning, spatial reasoning, informal geometry and measurement, coordinate graphing, and informational graphs.

*Note: This course is designed for students who passed Mathematics 12 or who placed into Mathematics 23. This course is repeatable and open for enrollment at registration and at any time during the semester.*

**Conditions of Enrollment: Prerequisite**

Mathematics 12  
with a minimum grade of C  
or

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

**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:

EI 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. Given an arithmetic expression involving rational numbers, multiple operations, and grouping symbols, students will simplify (or evaluate) the expression correctly, performing one operation at a time and without utilizing the commutative, associative, or distributive properties.
2. When presented with a linear equation in one variable that can be solved in two steps or a linear expressions that can be simplified in one step, students will demonstrate their ability to correctly identify each, to solve and check the equation and to simplify the expression, neatly showing all steps in order.

The above SLOs were the most recent available SLOs at the time of course review. For the most current SLO statements, visit the EI 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. 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.  
Written homework
2. Formulate mathematical representations of real-world applications, including the recognition of proportional relationships.  
Class Performance
3. Use estimations to determine the reasonableness of results.  
Quizzes
4. Recognize and apply the concepts of variable, expression, and equation.  
Objective Exams
5. Solve linear equations.  
Written homework
6. Find perimeters, areas, and volumes of various geometrical shapes and use in applications.  
Quizzes
7. Use the properties of the real numbers to evaluate, simplify, and factor algebraic expressions, including expressions with fractions and radicals.  
Objective Exams

**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	3	I	<b>INFORMATIONAL GRAPHING</b> A. Measurement/Scale reading B. Reading, interpreting and drawing graphs C. Collecting and organizing data D. Mean, mode, and median
Lecture	5	II	<b>GEOMETRY AND MEASUREMENT</b> A. Formulas: area, perimeter, volume, surface area B. Dimensional Analysis: converting from one unit to another C. Applications interspersed
Lab	2	III	<b>Math Lab - Operations &amp; Applications for:</b> A. Informational graphing B. Geometry and measurement
Lecture	6	IV	<b>INTEGERS</b> A. Operations on signed numbers B. Order of operations C. Introduction algebraic expressions D. Applications
Lecture	5	V	<b>EQUATION SOLVING WITH INTEGERS</b> A. Simple Linear Equations: B. Properties: (for example, distributive and equality properties) C. Like terms D. Linear equations with more than 1 operation
Lab	2	VI	<b>Math Lab - Operations &amp; Applications for:</b> A. Integers B. Equation solving with Integers
Lecture	7	VII	<b>EQUATION SOLVING WITH COMMON FRACTIONS AND DECIMAL FRACTIONS</b> A. Equivalent forms (such as $1/5 = .2$ or $0.5 < 0.52$ ) B. Equations: Formal and Informal methods C. Applications
Lecture	5	VIII	<b>RATIO, PROPORTION AND PERCENT</b> A. Ratio and Proportion B. Percent C. Equivalent forms (such as $150\% = 1.5$ or $0.5\% < 0.01$ ) D. Using algebraic methods to solve proportions and percent problems E. Applications interspersed

Lecture	2	IX	COORDINATE GRAPHING A. Plotting ordered pairs B. Linear graphs and tables of ordered pairs
Lab	1	X	Math Lab - Applications A. Ratios B. Proportions C. Percents
Lecture	9	XI	BASIC OPERATIONS AND MANIPULATIONS WITH ALGEBRAIC EXPRESSIONS  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
Lab	1	XII	Math Lab - Operations and manipulations of Algebraic Expressions
<b>Total Lecture Hours</b>		42	
<b>Total Laboratory Hours</b>		6	
<b>Total Hours</b>		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:

Find the sum of  $9/48$  and  $-7/40$ .

##### C. COLLEGE-LEVEL CRITICAL THINKING ASSIGNMENTS:

1. Define variable(s), set up an equation, and solve the following:

The sum of two numbers is 32. The larger number is four less than three times the smaller number. What are the two numbers?

Show all of your work and explain your reasoning.

2. A restaurant in Hollywood produced 30 pounds of garbage in 1-1/2 days. How many pounds of garbage do they produce in two weeks? Explain your reasoning using sentences or pictures or both.

#### **D. OTHER TYPICAL ASSESSMENT AND EVALUATION METHODS:**

Other exams

Class Performance

Homework Problems

Presentation

#### **V. INSTRUCTIONAL METHODS**

Demonstration

Discussion

Group Activities

Laboratory

Lecture

Multimedia presentations

**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. 9 ed. Pearson, 2012.

##### **B. ALTERNATIVE TEXTBOOKS**

**C. REQUIRED SUPPLEMENTARY READINGS****D. OTHER REQUIRED MATERIALS**

Two inches of three ring binder, one 120pages 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-12 or	Sequential
Non-Course Prerequisite	This course is for students placed into Math 23. Testing will equip students with the information and tools necessary for success in the mathematical sequences of classes they take for graduation and transfer.

**B. Requisite Skills**

Requisite Skills
1.Use the order of operations to add, subtract, multiply, divide and exponentiate whole numbers, fractions and decimals. 2.Use rounding techniques to estimate results of operations on whole numbers, fractions and decimals. 3.Use divisibility tests and prime factorization to reduce fractions to lowest terms and perform operations on fractions. 4.Convert rational numbers into decimals, fractions and percentages. 5.Solve various application problems requiring the use of ratios, proportions, and percentages. 6.Formulate mathematical representations of real-world applications including the recognition of proportional relationships. 7.Formulate mathematical representations of real-world applications including the recognition of proportional relationships.

**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