EL CAMINO COLLEGE
COURSE OUTLINE OF RECORD

I. COURSE DESCRIPTION

Course Title and Number :	Mathematics 40 (UPDATE)
Descriptive Title :	Elementary Algebra
Discipline :	Mathematics
Division :	Mathematical Sciences
Course Length :	☑ Full Term ☐ Other (specify:)
Hours Lecture :	4
Hours Laboratory :	0
Course Units :	4
Grading Method :	☑ Letter ☐ Pass/No Pass ☐ Both ☐ No Grade
Course Type :	☑ Credit, Degree Applicable ☐ Credit, Not Degree Applicable ☐ Non-Credit
Transfer CSU :	☐ Yes (Effective Date:) ☑ No
Transfer UC :	☐ Yes (Approval Date:) ☐ Pending ☑ No

Conditions of Enrollment: Specify Prerequisite, Corequisite, Recommended Preparation, Enrollment Limitation, or None.

Mathematics 23 or Mathematics 25 with a minimum grade of C in prerequisite, or qualification by testing (El Camino College Mathematics Placement Test) and assessment.

Catalog Description :

This course in elementary algebra includes 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 of linear equations, factoring techniques, and simplification of rational and radical expressions.

II. COURSE OBJECTIVES

List the major objectives of the course. These must be stated in behaviorally measurable terms.

1. Use the specialized vocabulary describing the real number system and its properties as well as the fundamentals of algebra.

2. Manipulate (evaluate, simplify, or factor) algebraic expressions, including expressions with fractions and radicals.

3. Solve linear equations and inequalities, systems of linear equations, and quadratic equations.

4. Solve various application problems which feature the mathematics under study using elementary modeling techniques.

5. Graph linear equations and systems of linear equations on a coordinate plane, isolating features such as intercepts and slope.

III. OUTLINE OF SUBJECT MATTER

The topics should be detailed enough to enable an instructor to determine the major areas that should be covered and so that the course may have consistency from instructor to instructor and semester to semester.

Approximate Time in Hours	Major Topics
24	I. Basic Operations and Manipulations with Algebraic Expressions A. Simplify and evaluate algebraic expressions using order of operations. Use the Distributive Property appropriately. B. In an algebraic expression, identify constants, variables, terms, variable terms, the degree of a variable term, and the coefficient of a variable term. Identify monomials, binomials and trinomials. C. Perform arithmetic operations on polynomials including long division and use of integer exponents. Use the Commutative, Associative, and Distributive Properties appropriately. D. Factor polynomials (including those with common monomial factors, the difference of squares and perfect square trinomials.) Factor by grouping in simple and general trinomials. E. Perform operations on rational expressions. F. Perform arithmetic operations on radical expressions.
22	II Equations and Inequalities A. Identify and simplify linear expressions. Solve linear equations and inquaities. 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.
11	III Applications 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, ratios and proportions. Examples include work, distance, and mixture problems.

15 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.

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72 TOTAL HOURS

IV. METHODS OF EVALUATION

A. CREDIT, DEGREE APPLICABLE AND CREDIT, NOT DEGREE APPLICABLE COURSES

Check the PRIMARY method of evaluation for this course.

- ☐ Substantial writing assignments
- ☑ Problem solving demonstrations (computational or non-computational)
- ☐ Skill demonstrations

A minimum of one response in 1, 2, or 3 below, as applicable, is required. However, you may check all that apply.

1. Indicate the types of writing assignments used as primary or secondary methods of evaluation for this course.

   - ☐ Essay exams
   - ☐ Written homework
   - ☐ Term or other papers
   - ☐ Reading reports
   - ☐ Laboratory reports
   - ☐ Other (specify)

2. Indicate the types of problem-solving demonstrations used as primary or secondary methods of evaluation for this course.

   - ☑ Exams
   - ☐ Laboratory reports
   - ☑ Quizzes
   - ☑ Homework problems
   - ☐ Fieldwork
   - ☐ Other (specify)

3. Indicate the types of skill demonstrations used as primary or secondary methods of evaluation for this course.

   - ☐ Class performance
   - ☐ Performance exams
   - ☐ Fieldwork
   - ☐ Other (specify)

4. If objective exams are also used, check all that apply.

   - ☐ Multiple choice
   - ☐ Completion
   - ☐ Matching items
   - ☐ True/false
   - ☐ Other (specify)

B. NON-CREDIT COURSE

Indicate the methods of evaluation that will be used to determine that the stated objectives have been met.

V. COURSEWORK

A. TYPICAL ASSIGNMENT

Provide an example of a typical assignment. This assignment must correspond to the PRIMARY method of evaluation indicated in Section IV, Methods of Evaluation. That is, it must be a writing assignment or, if more appropriate, an assignment involving problem solving or skill demonstration.

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.

B. COLLEGE-LEVEL CRITICAL THINKING ASSIGNMENTS

Cite two specific assignments that demonstrate college-level critical thinking. (Required for degree applicable courses only.)

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 many gallons of 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.

C. WORK OUTSIDE OF CLASS

Two hours of work outside of class are required for each hour of lecture or equivalent. Each student in this course will be required to participate in the following work outside of class time. Check all that apply.

- [x] Study
- [ ] Answer questions
- [ ] Skill practice
- [x] Required reading
- [x] Problem solving activity
- [ ] Written work (such as essay/composition/report/analysis/research)
- [ ] Journal (done on a continuing basis throughout the semester)
- [ ] Observation of or participation in an activity related to course content (such as theatre event, museum, concert, debate, meeting)
- [ ] Course is lab only - minimum required hours satisfied by scheduled lab time
- [ ] Other (specify)

VI. INSTRUCTIONAL METHODOLOGY

Check all planned instructional activities that apply:

- [x] Lecture
- [ ] Lab
- [ ] Discussion
- [ ] Multimedia presentations
- [ ] Demonstration
- [ ] Group activities
- [ ] Role play/simulation
- [ ] Guest speakers
- [ ] Field trips
- [ ] Other (specify)

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, instructional delivery shall provide access, full inclusion, and effective communication for students with disabilities.

VII. TEXTS AND MATERIALS

If multiple selection is offered, only representative texts need be listed. An up-to-date list of required and recommended materials is maintained in the division office.

A. REQUIRED TEXTS (title, author, publisher, year)

Elementary Algebra: Concepts and Applications, Bittinger and Ellenbogen, Pearson, Addison Wesley, 2006.

B. REQUIRED SUPPLEMENTARY READINGS

C. OTHER REQUIRED MATERIALS

VIII. CONDITIONS OF ENROLLMENT

If this course has a prerequisite or corequisite, complete section A. If this course has an Enrollment Limitation, complete section B.

A. PREREQUISITE AND/OR COREQUISITE

1. Indicate if this course has a prerequisite, corequisite, both, or none.

   ☑ Prerequisite
   ☐ Corequisite

2. Indicate Type. Check all that apply.

   ☑ Sequential
   ☐ Computational/Communication Skills
   ☐ Health and Safety
   ☐ Non-Course
   ☐ Standard (If this is a Standard Prerequisite or Corequisite, attach CCC Form D.)

3. Entrance Skills/Knowledge

   List the required skills and/or knowledge without which a student would be highly unlikely to receive a grade of A, B, C, or Credit (or for Health and Safety, would endanger self or others) in this course.

   1. Effective study skills.

   2. 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.

   3. Use order of operations appropriately.

   4. Recognize and apply the concepts of variable, expression, and equation.

   5. Solve simple one-step linear equations.

   6. Determine perimeters and areas of various geometrical shapes and use in applications.

   7. Read, interpret, and construct graphs.

   8. Identify the base, the exponent and the power when given an exponential expression.

   9. Use the Commutative, Associative and Distributive Properties appropriately.

   10. Factor whole composite numbers, and recognize prime numbers. Recognize, identify and find factors, divisors and multiples of whole numbers.

B. ENROLLMENT LIMITATION

1. Indicate the category which describes the Enrollment Limitation for this course.

   ☐ Band/Orchestra
   ☐ Theater
   ☐ Speech
   ☐ Chorus
   ☐ Journalism
   ☐ Dance
   ☐ Intercollegiate Athletics
   ☐ Honors Course

☐ Blocks of Courses
☐ Other (specify)

2. List Degree and/or Certificate requirements that are met by this course.

3. List all El Camino College courses that also satisfy the requirements listed above in section B.2.

Originator: Dwann Veroda Submittal Date: March, 1977

BOARD APPROVAL DATE:

Reviewed and/or Revised by:

Myrna Manly Date: October, 1998

Myrna Manly Date: January, 2001

Jacquelyn Sims Date: November, 2007