I. GENERAL COURSE INFORMATION

Subject and Number: Mathematics 37
Descriptive Title: Basic Algebra and Mathematics
Course Disciplines: Mathematics
Division: Mathematical Sciences

Catalog Description:
This elementary algebra course provides students who place below the elementary algebra level the opportunity to develop numeracy skills, strengthen mathematical reasoning skills, and complete elementary algebra in a single semester. There are three levels of mathematics in this course, taught in an integrated fashion: basic arithmetic skills; fundamentals of algebra, with an emphasis on linear equations; and the remaining topics found in a typical elementary algebra course. This course has multiple exit levels, based on a student's demonstrated competencies. Students engage in student-success activities tailored specifically for mathematics courses.

Note: This course is not recommended for students who place at or above the elementary algebra level.

Conditions of Enrollment:
You have no defined requisites.

Course Length:	**X Full Term**	**Other (Specify number of weeks):**
Hours Lecture:	**4.50 hours per week**	**TBA**
Hours Laboratory:	**3.50 hours per week**	**TBA**
Course Units:	**5.00**	

Grading Method: Pass / No Pass
Credit Status: Associate Degree 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)

SLO #1 Application Problems
A student will be able to recognize the underlying mathematical concepts, with an emphasis on linear relations, in a given context (word problems, data, diagrams, etc.) and apply those concepts correctly.

SLO #2 Solving Equations and Manipulating Expressions
A student will be able to demonstrate the ability to identify and correctly implement techniques to symbolically solve equations, with an emphasis on linear equations, and manipulate expressions.

SLO #3 Visual and Graphical Methods
A student will be able to use visual and graphical methods to represent and analyze information and to solve problems, with an emphasis on linear graphs.

SLO #4 Articulating Mathematical Reasoning
A student will be able to articulate orally or in written form the mathematical reasoning they used to solve a problem or analyze a situation.

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. Read and write integers and decimal numbers in standard, expanded, and verbal forms.
2. Perform basic operations (addition, subtraction, multiplication, division, and exponentiation) on real numbers, including reducing fractions to lowest terms.
3. Use the order of operations to evaluate expressions that combine the addition, subtraction, multiplication, division and exponentiation of real numbers.
4. Order a given set of real numbers.
5. Convert rational numbers into decimals, fractions and percentages.
6. Use the properties of the real numbers to evaluate, simplify, and factor algebraic expressions, including expressions with fractions and radicals.
7. Use rounding techniques to estimate results of operations on real numbers and determine the reasonableness of results.
8. Formulate mathematical representations of real-world applications including the recognition of proportional relationships.
9. Recognize and apply the concepts of variable, expression, equation and function.
10. Find perimeters, areas, and volumes of various geometrical shapes and use in applications.
11. Represent linear and quadratic models with tables, graphs and equations (coordinate graphing), and transform the model from one representation to another.
12. Set up, graph, and solve linear equations, systems of linear equations, and linear inequalities using a variety of techniques.
13. Set up, graph and solve quadratic equations using a variety of methods, including factoring, the square root property, completing the square, and the quadratic formula.
14. Set up and solve application problems using rational and radical equations.
15. Demonstrate the use of multiple student success strategies.
16. Create and use a multi-semester education plan, developed with assistance from a counselor.

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	24	I	Level A Topics A. Basic Operations on Integers (Addition, Subtraction, Multiplication, Division, Exponentiation (whole number exponents), and the Order of Operations) B. Factors, Greatest Common Factors C. Multiples, Least Common Multiples D. Basic Operations on Fractions (Addition, Subtraction, Multiplication, Division, Exponentiation with whole number exponents, and the Order of Operations) E. Basic Operations on Decimal Numbers (Addition, Subtraction, Multiplication, Division, Exponentiation with whole number exponents, and the Order of Operations) F. Properties of Real Numbers G. Decimals, Fractions, and Percentages H. Rates and Ratios I. Setting Up and Solving Percent Equations J. Perimeter, Area, and Volume
Lab	21	II	Level A Laboratory Topics A. Basic Operations on Integers (Addition, Subtraction, Multiplication, Division, Exponentiation (whole number exponents), and the Order of Operations) B. Factors, Greatest Common Factors C. Multiples, Least Common Multiples D. Basic Operations on Fractions (Addition, Subtraction, Multiplication, Division, Exponentiation with whole number exponents, and the Order of Operations) E. Basic Operations on Decimal Numbers (Addition, Subtraction, Multiplication, Division, Exponentiation with whole number exponents, and the Order of Operations) F. Properties of Real Numbers G. Decimals, Fractions, and Percentages H. Rates and Ratios I. Setting Up and Solving Percent Equations J. Perimeter, Area, and Volume
Lecture	24	III	Level B Topics A. Variables and Linear Equations with Integer Coefficients B. Solving Linear Equations with Integer Coefficients C. Graphing Linear Equations with Integer Coefficients D. Variables and Linear Equations with Fractional and Decimal Coefficients E. Solving Linear Equations with Fractional and Decimal Coefficients

			F. Graphing Linear Equations with Fractional and Decimal Coefficients G. Operations on Polynomials with Integer, Fractional, and Decimal Coefficients (Addition, Subtraction, Multiplication, Squaring, but no Division) H. Solving and Graphing Linear Inequalities I. Solving Systems of Linear Equations, Graphically, Numerically (using tables of values), and Symbolically (using substitution and elimination) J. Evaluation Machines, Functions and Function Notation
Lab	21	IV	Level B Laboratory Topics A. Variables and Linear Equations with Integer Coefficients B. Solving Linear Equations with Integer Coefficients C. Graphing Linear Equations with Integer Coefficients D. Variables and Linear Equations with Fractional and Decimal Coefficients E. Solving Linear Equations with Fractional and Decimal Coefficients F. Graphing Linear Equations with Fractional and Decimal Coefficients G. Operations on Polynomials with Integer, Fractional, and Decimal Coefficients (Addition, Subtraction, Multiplication, Squaring, but no Division) H. Solving and Graphing Linear Inequalities I. Solving Systems of Linear Equations, Graphically, Numerically (using tables of values), and Symbolically (using substitution and elimination) J. Evaluation Machines, Functions and Function Notation
Lecture	24	V	Level C Topics A. Factoring Quadratic Expressions B. Solving Quadratic Equations using Factoring C. Dividing Polynomials D. Absolute Value Equations E. Solving Quadratic Equations using the Square Root Property F. Solving Quadratic Equations using Completing the Square G. Solving Quadratic Equations using the Quadratic Formula H. Graphing Quadratic Functions I. Rational Expressions and Equations J. Radical Expressions and Equations
Lab	21	VI	Level C Laboratory Topics A. Factoring Quadratic Expressions B. Solving Quadratic Equations using Factoring C. Dividing Polynomials D. Absolute Value Equations E. Solving Quadratic Equations using the Square Root Property F. Solving Quadratic Equations using Completing the Square

			G. Solving Quadratic Equations using the Quadratic Formula H. Graphing Quadratic Functions I. Rational Expressions and Equations J. Radical Expressions and Equations
Lecture	9	VII	Mathematics-Tailored Affective Domain and Student Success Skills A. Creating a Growth Mindset and Self-Belief/Confidence in Mathematics B. Connecting Personal Passion and Long-term Goals with Mathematics Learning C. Setting Short-term Goals and Time Management in an Intense Mathematics Course D. Reducing Negative Struggles and Increasing Positive Struggles in Studying Mathematics
Total Lecture Hours		81	
Total Laboratory Hours		63	
Total Hours		144	

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:

Performance exams
Objective Exams
Other exams
Embedded questions
Quizzes
Homework Problems

V. INSTRUCTIONAL METHODS

Group Activities
Internet Presentation/Resources
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
Required reading
Problem solving activities

Estimated Independent Study Hours per Week: 7

VII. TEXTS AND MATERIALS

A. UP-TO-DATE REPRESENTATIVE TEXTBOOKS

John Squires and Karen Wyrick. MyMathLab for Squires / Wyrick Developmental Mathematics Notebook. 1st ed. Pearson, 2012. (Industry standard)
Note: There is no textbook for this course. The above is simply an online resource used in the laboratory.

B. ALTERNATIVE TEXTBOOKS

C. REQUIRED SUPPLEMENTARY READINGS

D. OTHER REQUIRED MATERIALS

VIII. CONDITIONS OF ENROLLMENT

A. Requisites (Course and Non-Course Prerequisites and Corequisites)

Requisites	Category and Justification

B. Requisite Skills

Requisite Skills

C. Recommended Preparations (Course and Non-Course)

Recommended Preparation	Category and Justification

D. Recommended Skills

Recommended Skills

E. Enrollment Limitations

Enrollment Limitations and Category	Enrollment Limitations Impact

Course created by Lars Kjeseth on 09/28/2012.

BOARD APPROVAL DATE: 01/22/2013

LAST BOARD APPROVAL DATE: 01/22/2019

Last Reviewed and/or Revised by: Alice Martinez **Date: 06/02/2020**

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