

College of San Mateo
Official Course Outline

1. COURSE ID: MATH 110 **TITLE:** Elementary Algebra

Units: 5.0 units **Hours/Semester:** 80.0-90.0 Lecture hours; and 160.0-180.0 Homework hours

Method of Grading: Letter Grade Only

Prerequisite: MATH 811 or MATH 802 or placement by other college approved methods.

2. COURSE DESIGNATION:

Non-Degree Credit

Transfer credit: none

3. COURSE DESCRIPTIONS:

Catalog Description:

A study of elementary algebra including introduction to: signed number operations, order of operations, linear equations and inequalities in one and two variables, systems of linear equations, exponents, polynomial operations, factoring, rational expressions and equations, roots, radicals and radical equations, and quadratic equations.

4. STUDENT LEARNING OUTCOME(S) (SLO'S):

Upon successful completion of this course, a student will meet the following outcomes:

1. Identify and apply basic algebraic concepts including slope, absolute value, scientific notation, equivalent equations, laws of exponents, intercepts, horizontal lines, and vertical lines.
2. Solve: systems of linear equations in two unknowns using graphing, elimination, and substitution; linear equations and inequalities in one variable; quadratic equations by factoring and by using the quadratic formula; rational equations; elementary radical equations.
3. Find the equation of a line.
4. Graph linear equations.
5. Solve application problems involving linear relationships.
6. Apply the properties of and perform operations with integer exponents, polynomial expressions, radical expressions and rational expressions.

5. SPECIFIC INSTRUCTIONAL OBJECTIVES:

Upon successful completion of this course, a student will be able to:

1. Identify and apply basic algebraic concepts including slope, absolute value, scientific notation, equivalent equations, laws of exponents, intercepts, horizontal lines, and vertical lines.
2. Solve systems of linear equations in 2 unknowns using graphing, elimination, and substitution.
3. Solve equations and inequalities in one variable.
4. Solve quadratic equations by factoring and the quadratic formula.
5. Solve elementary radical equations.
6. Graph linear equations.
7. Solve problems by application of linear functions.
8. Apply the properties of and perform operations with radicals.
9. Apply the properties of and perform operations with integer exponents.

6. COURSE CONTENT:

Lecture Content:

1. Signed number operations and order of operations
2. Linear Equations and Inequalities
 - A. Solving one-step equations
 - B. Solving two-step equations
 - C. Solving multi-step equations
 - D. Formulas
 - E. Applications
3. Linear Equations and Inequalities in Two Variables
 - A. Graphing points
 - B. Graphing linear equations in two variables
 - C. Intercepts
 - D. Slope

- E. Slope intercept method
- F. Finding the equation of a line
- G. Graphing linear inequalities in two variables (optional)
- 4. Systems of Linear Equations
 - A. Graphing
 - B. Elimination
 - C. Substitution
 - D. Applications
- 5. Exponents and Polynomials
 - A. Multiplication and Division with exponents
 - B. Operations with monomials
 - C. Operations with polynomials
 - D. Special polynomials
- 6. Factoring
 - A. Greatest Common Factor
 - B. Factoring out common factors
 - C. Factoring Trinomials
 - D. Difference of Squares
- 7. Rational Expressions
 - A. Reducing to lowest terms
 - B. Operations with Rational expressions
 - C. Equations with Rational expressions
 - D. Applications
- 8. Roots and Radicals (sufficient for work with Quadratic Formula)
 - A. Simplification of Radical expressions
 - B. Operations with Radical expressions
 - C. Equations with Radical expressions (optional)
- 9. Quadratic Equations
 - A. Quadratic Formula
 - B. Completing the Square (optional)
 - C. Applications
 - D. Graphing Parabolas (optional)

7. REPRESENTATIVE METHODS OF INSTRUCTION:

Typical methods of instruction may include:

- A. Lecture
- B. Activity
- C. Discussion
- D. Observation and Demonstration
- E. Other (Specify): Lecture/discussion to understand problem-solving process, students will practice critical thinking in small group problem solving, students will evaluate proposed solutions in light of constraints of the problem.

8. REPRESENTATIVE ASSIGNMENTS

Representative assignments in this course may include, but are not limited to the following:

Writing Assignments:

Students will submit written homework assignments. Students may be assigned papers including mathematical modeling.

Reading Assignments:

Instructor will assign text readings for discussion of a topic in class.

Other Outside Assignments:

Students will need to complete assigned problems and projects.

9. REPRESENTATIVE METHODS OF EVALUATION

Representative methods of evaluation may include:

- A. Class Participation
- B. Exams/Tests
- C. Group Projects
- D. Homework
- E. Quizzes

- F. Written individual assignments and/or journal- to demonstrate individual student progress toward objectives. Small group presentations - to demonstrate student participation in problem solving process. Written exams/quizzes - to reflect student knowledge of vocabulary, concepts, and application of concepts to problem solving as presented in lectures and discussion, small group sessions, and text readings. Final Examination - to reflect student knowledge of vocabulary, concepts, and applications of concepts to problem solving as presented in lectures and discussions, small group sessions, and text readings. Participation - to reflect student involvement in class discussions, small group sessions and presentations, etc.

10. **REPRESENTATIVE TEXT(S):**

Possible textbooks include:

- A. Bittinger, M., Ellenbogen, D.. *Elementary Algebra: Concepts and Applications*, ed. Pearson, 2017
- B. Lehmann, J.. *Introductory Algebra: Graphs and Authentic Applications*, ed. Pearson, 2018

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Course Originator: Christopher Walker