* Subject Area: Mathematics

* Category: Algebra 1; Yr 1 of 2

* Grade Level for which this course has been designed: ☑ 9 ☐ 10 ☐ 11 ☐ 12

* Unit Value: 1.0 (one year, 2 semesters, or 3 trimesters equiv.)

* Is this course classified as a Career Technical Education: No

* Brief Course Description

Symbolic reasoning and calculations with symbols are central in algebra. Through the study of algebra, a student develops an understanding of the symbolic language of mathematics and the sciences. In addition, algebraic skills and concepts are developed and used in a wide variety of problem-solving situations. Through practice and applications, students develop skills in dealing with the essentials of a first-year algebra course, including properties of and operation with real numbers, linear and quadratic equations, inequalities, polynomials, rational expressions, radicals, problem solving, factoring, and graphing.

Pre-Requisites

Grade of "C" or better in Pre-Algebra - Recommended

Co-Requisites

Context for Course (optional)

History of Course Development (optional)

Textbooks

TEXTBOOK 1

＊ **Title:**
California Algebra 1: Concepts Skills and Problem Solving

＊ **Edition:**
CA

＊
Publication Date:
2008

＊
Publisher:
Glencoe

＊
Author(s):
Burke

URL Resource:

＊ **Usage:**
Primary Text

Read in entirety or near entirety

TEXTBOOK 2

＊ **Title:**
Algebra 1

＊ **Edition:**
CA

＊
Publication Date:
2006

TEXTBOOK 2

* Publisher: Prentice Hall

* Author(s):   Smith

URL Resource:

* Usage:

Primary Text

Read in entirety or near entirety

TEXTBOOK 3

* Title: Algebra 1

* Edition: CA

* Publication Date: 2007

* Publisher: McDougal-Littell

* Author(s):   Larson

URL Resource:

* Usage:

Primary Text

TEXTBOOK 3

Read in entirety or near entirety

Supplemental Instructional Materials

Solutions Manual - A complete solution for each problem in the student edition lessons.

✳ Course Purpose

The key content for the Algebra I, involves under-standing, writing, solving, and graphing linear and quadratic equations, including systems of two linear equations in two unknowns. Quadratic equations may be solved by factoring, completing the square, using graphs, or applying the quadratic formula. Students should also become comfortable with operations on monomial and polynomial expressions. They learn to solve problems employing all of these techniques, and they extend their mathematical reasoning in many important ways, including justifying steps in an algebraic procedure and checking. The main topical objectives are:
• Operations • Linear Equations and Inequalities • Polynomials • Quadratic Equations
•Relations & Functions • Word problems

✳ Course Outline

Coursework will include a thorough understanding and application of the following topics as they are presented in the text:

Students identify and use the arithmetic properties of subsets of integers and rational, irrational, and real numbers, including closure properties for the four basic arithmetic operations where
applicable:

Students understand and use such operations as taking the opposite, finding the reciprocal, taking a root. They understand and use the rules of exponents.

Students simplify expressions before solving linear equations and inequalities in one variable,

Students solve multistep problems, including word problems, involving linear equations and linear inequalities in one variable and provide justification for each step.

Students graph a linear equation and compute the x- and y-intercepts.

Students verify that a point lies on a line, given an equation of the line.

Students are able to derive linear equations.

Students understand the concepts of parallel lines and how those slopes are related.

Students solve a system of two linear equations in two variables algebraically and are able to interpret the answer graphically.

Students are able to solve a system of two linear inequalities in two variables and to sketch the solution sets.
Students add, subtract, multiply, and divide monomials and polynomials.

Students solve multistep problems, including word problems, by using these techniques.

Students apply basic factoring techniques to second- and simple third- degree polynomials. These techniques include finding a common factor for all terms in a polynomial, recognizing the difference of two squares, and recognizing perfect squares of binomials.

Students apply algebraic techniques to solve rate problems, work problems, and percent mixture problems.

Students understand the concepts of a relation and a function, determine whether a given relation defines a function, and give pertinent information about given relations and functions.

Students determine the domain of independent variables and the range of dependent variables defined by a graph, a set of ordered pairs, or a symbolic expression.

Students determine whether a relation defined by a graph, a set of ordered pairs, or a symbolic expression is a function and justify the conclusion.

Students use the quadratic formula to find the roots of a second-degree polynomial and to solve quadratic equations.

Students graph quadratic functions and know that their roots are the x-intercepts.

Students use the quadratic formula or factoring techniques or both to determine whether the graph of a quadratic function will intersect the x- axis in zero, one, or two points.

Students apply quadratic equations to physical problems, such as the motion of an object under the force of gravity.

Students use and know simple aspects of a logical argument:

Students explain the difference between inductive and deductive reasoning and identify and provide examples of each.

Students identify the hypothesis and conclusion in logical deduction.

Students use counterexamples to show that an assertion is false and recognize that a single counterexample is sufficient to refute an assertion.

Students use properties of the number system to judge the validity of results, to justify each step of a procedure, and to prove or disprove statements:

Students use properties of numbers to construct simple, valid arguments (direct and indirect) for, or formulate counterexamples to, claimed assertions.

Students judge the validity of an argument according to whether the properties of the real number system and the order of operations have been applied correctly

at each step.

Given a specific algebraic statement involving linear, quadratic, or absolute value expressions or equations or inequalities, students determine whether the statement is true sometimes, always, or never.

Unit 1 Foundations for Functions
Chapter 1 The Language and Tools of Algebra
Chapter 2 Solving Linear Equations

Unit 2 Linear Functions
Chapter 3 Functions and Patterns
Chapter 4 Analyzing Linear Equations
Chapter 5 Solving Systems of Linear Equations
Chapter 6 Solving Linear Inequalities

Unit 3 Polynomials and Nonlinear Functions
Chapter 7 Polynomials
Chapter 8 Factoring
Chapter 9 Quadratic and Exponential Functions

Unit 4 Advanced Expressions and Data Analysis
Chapter 10 Radical Expressions and Triangles
Chapter 11 Rational Expressions and Equations
Chapter 12 Statistics and Probability

✳ Key Assignments

Unit by unit problem sets and Unit tests.
Written exams: Chapter quizzes, comprehensive midterm/final.
Applied concepts projects as determined by teacher.

✳ Instructional Methods and/or Strategies

College Model of Education: Personalized Learning Model emphasizes independent study while attending Resource Center classes twice weekly. Students may choose
to meet weekly with their Personalized Learning Teacher and/or Highly Qualified Teacher instead. The same instructional methods are used in either case.
*Direct Instruction
*Project/Group Work
*On-line/interactive instruction
• Presentation: Concepts are introduced, explained, and demonstrated during weekly class/teacher (Pesonalized Learning and Highly Qualified) meetings. Following the information, corresponding questions, writing assignments, and activities are given to evaluate comprehension.
• Discussion: Students analyze, discuss, and respond to issues and ideas stimulated by presentations and readings. Students work in small groups or one-on-one whenever possible to increase participation.
• Oral Presentation: Students present information during weekly class meetings both formally and informally. Presentations include Power Point, debate, and discussion, and always include an outline or handout and audio-visual aides.
• Library/Internet Research: Students research topics that are relevant to the reading assignments and give written and oral reports of their findings.

✳ **Assessment Methods and/or Tools**

• Attendance at Resource Center Class twice weekly OR weekly review of work by Personalized Learning Teacher/Highly Qualified Teacher
• Oral presentations
• Discussions: classroom participation and small group work. If not enrolled in Resource Center class then weekly discussions with Personalized Learning Teacher/Highly Qualified Teacher.
• Weekly homework assignments
• Chapter/Unit tests
• Comprehensive midterm/final
Assessment tools may also include the following:
• Participation in weekly lab activity with graded lab manual (science courses)

• Student demonstrations
• Student work samples
• Research Projects
• Projects: Power Point Presentation, brochures, community service, etc.

Exams, homework assignments, discussions, oral presentations, and writing
assignments are used to assess student progress. All work is corrected by the
course instructor and/or Personalized Learning Teacher/Highly Qualified Teacher.

Print   Close

Send e-mail to: hsupdate@ucop.edu

[back to top]   © UC Regents