MT. DIABLO UNIFIED SCHOOL DISTRICT
COURSE OF STUDY
DRAFT

COURSE TITLE:	**Algebra I**
COURSE NUMBER:	**1310**
CALPADS NUMBER:	**2403**
CST:	**Algebra**
DEPARTMENT:	**High School/Middle School Mathematics**
NCLB CREDENTIAL	
REQUIREMENT:	**Math Credential with Subject Matter Proficiency**
LENGTH OF COURSE:	**One Year**
CREDITS PER SEMESTER:	**5**
GRADE LEVEL(S):	**8-12**
REQUIRED OR ELECTIVE:	**This course fulfills one year of the high school mathematics requirement and UC/CSU "c" requirement.**
	Eighth grade students do not receive high school credit for this course.
	Completion of this course in middle or high school fulfills the California State Algebra I graduation requirement.
PREREQUISITES:	**None**

BOARD OF EDUCATION ADOPTION:

COURSE DESCRIPTION:

This course covers the twenty five California State Mathematics Standards for Algebra I. Emphasis is on writing, solving, and graphing linear and quadratic equations. The ability to communicate mathematical reasoning and understanding will be incorporated into all math topics. In addition, algebraic skills and concepts are developed and used in a wide variety of problem solving situations. This course is the first course in the three-year mathematics requirement for four-year college admission.

COURSE OUTLINE:

1.   MAJOR GOALS

1.1   To develop the ability to reason logically and think symbolically
1.2   To develop skills for communicating mathematically
1.3   To build mathematical models, formulate and solve problems
1.4   To improve the skills necessary to be successful in various careers

2. PERFORMANCE OBJECTIVES:
(numbers in parentheses refers to appropriate California State Algebra I standard)

2.1 <u>Algebra I</u>

2.1.1 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 (1.0)

2.1.2 Use the properties of numbers to demonstrate whether assertions are true or false. (1.1)

2.1.3 Understand and use such operations as taking the opposite, finding the reciprocal, taking a root, and raising to a fractional power. Understand and use the rules of exponents. (2.0)

2.1.4 Solve equations and inequalities involving absolute values (3.0)

2.1.5 Simplify expressions (4.0)

2.1.6 Solve multi-step problems (5.0)

2.1.7 Graph a linear equation, and compute the x and y intercept; sketch the region defined by linear inequality (6.0)

2.1.8 Verify that a point lies on a line given an equation of the line. Derive linear equations using the point-slope formula (7.0)

2.1.9 Find the equation of a line perpendicular to a given line that passes through a given point (8.0)

2.1.10 Solve a system of two linear equations in two variables; solve a system of two linear inequalities and sketch the solution set (9.0)

2.1.11 Add, subtract, multiply and divide monomials and polynomials (10.0)

2.1.12 Apply basic factoring techniques to second and simple third degree polynomials (11.0)

2.1.13 Simplify fractions with polynomials in the numerator and denominator (12.0)

2.1.14 Add, subtract, multiply, and divide rational expressions and functions (13.0)

2.1.15 Solve a quadratic equation by factoring or completing the square (14.0)

2.1.16 Apply algebraic techniques to rate problems, work problems, and percent mixture problems (15.0)

2.1.17 Understand the concepts of a relation and function (16.0)

2.1.18 Determine the domain of independent variables, and range of dependent variables defined by a graph, a set of ordered pairs, or symbolic expression (17.0)

2.1.19 Determine whether a relation is a function (18.0)

2.1.20 Learn the quadratic formula and become familiar with its proof by completing the square (19.0)

2.1.21 Use the quadratic formula to find the roots of a second degree polynomial (20.0)

2.1.22 Graph quadratic functions and know that their roots are the x-intercepts (21.0)

2.1.23 Use the quadratic formula or factoring to determine how the graph intersects the x-axis (22.0)

2.1.24 Apply quadratic equations to physical problems such as the motion of an object under the force of gravity. (23.0)

2.1.25 Explain the difference between inductive and deductive reasoning; identify and provide examples of each. (24.1)

2.1.26 Identify the hypothesis and conclusion in logical deduction. (24.2)

2.1.27 Use counterexamples to show that an assertion is false and recognize that a single counterexample is sufficient to refute an assertion. (24.3)

2.1.28 Students use properties of numbers to construct simple, valid arguments (direct and indirect) for, or formulate counterexamples to, claimed assertions. (25.1)

2.1.29 Judge the validity of an argument based on whether the properties of the real number system and order of operations have been applied correctly at each step. (25.2)

2.1.30 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. (25.3)

3. CONTENT OUTLINE:
(numbers in parentheses refers to appropriate performance objectives)
3.1 Algebra I
   3.1.1 Properties of numbers (2.1.1-2.1.2)
   3.1.2 Exponents, reciprocals and working with roots (2.1.3)
   3.1.3 Equation and inequality solving (2.1.2, 2.1.4-2.1.6)
   3.1.4 Relations, Functions and Graphs (2.1.17-2.1.19)
   3.1.5 Graph of linear equations and linear inequalities (2.1.7)
   3.1.6 Linear equations (2.1.8-2.1.9)
   3.1.7 Systems of equations and inequalities including graphs (2.1.10)
   3.1.8 Polynomials, factoring techniques (2.1.11-2.1.13)
   3.1.9 Rational expressions and equations (2.1.14)
   3.1.10 Rate, work, and mixture problems (2.1.16)
   3.1.11 Quadratic equations, quadratic formula, including graphing (2.1.20-2.1.24)
   3.1.12 Logical reasoning and proof (2.1.25-2.1.28)

4. TIME ESTIMATES:
4.1 Instructional sequences vary in length from a few days to several weeks

5. INSTRUCTIONAL MATERIALS:
    5.1   District adopted textbooks
    5.2   Supplementary and teacher-created materials that include a career focus
    5.3   Technology materials

6. EVALUATION OF STUDENT PROGRESS:
Students communicate mathematically and demonstrate content knowledge that leads to mathematical competence in subsequent mathematics courses and chosen careers.
    6.1   Teacher observation
    6.2   Written assignments and projects
    6.3   Quizzes and tests
    6.4   Rubrics

<u>Committee Members:</u>

Name	Site
Frank Bruketta	CVHS
Danielle Dell	CVHS
Susan Seeley	CVHS
Bodhi Young	CVHS
Suzette Blanke	CPHS
Robert Lovelace	CPHS
Angel Niedzielski	CPHS
Norma Meyerkorth	CHS
Brianne Whiteside	CHS
Kathleen Magana	MDHS
Steve Sankey	MDHS
Judith Cubillo	NHS
Ellen Dill	NHS
Rianne Pfaltzgraff	NHS
Leslie Addiego	YVHS
Mary Ditkoff	YVHS
Kelly Donlon	YVHS
John Ghiozzi	YVHS
Sharon Simone	RMS
Sandy Bruketta	Curriculum Specialist (Curriculum & Instruction)