Modesto Junior College
Course Outline of Record
MATH 20

I. OVERVIEW
The following information will appear in the 2009 - 2010 catalog

MATH 20 ***Pre-Algebra*** ***5 Units***

Designed to help students prepare for algebra and applied math courses by reviewing fundamental operations of arithmetic and common geometric formulas, and introducing the algebraic concepts of simplifying expressions, polynomial arithmetic, and solving and graphing linear equations. Arithmetic reviewed includes whole numbers, integers, decimals, ratios, and percents.
Prerequisite: *Satisfactory completion of MATH 10. or equivalent placement by MJC assessment process*
Advisory: *Before enrolling in this course, students are strongly advised to have eligibility for READ 82 or higher*

Field trips are not required. **Units/Hours:** 5.00 Units: Lecture - 90.00 hours
Grading: A-F or P/NP - Student choice

II. LEARNING CONTEXT
Given the following learning context, the student who satisfactorily completes this course should be able to achieve the goals specified in Section III, Desired Learning:

A. COURSE CONTENT

1. Required Content:

a. The Whole Numbers
   i. Addition, Subtraction, Multiplication, and Division
   ii. The Number Line

b. Formulas
   i. Formulas
   ii. Evaluation of formulas
   iii. Applications

c. Measurement and applied geometry
   i. English system of measurement
   ii. Metric system of measurement
   iii. Area and volume of common objects
   iv. Perimeter

d. Algebra and Polynomials
   i. Simplifying algebraic expressions

ii. Adding and subtracting polynomials with whole number coefficients

iii. Multiplying polynomials

a. Polynomials multiplied by monomials

b. The product of two binomials – FOIL

iv. Dividing a polynomial by a monomial

v. Solving linear equations

e. Integers

i. Order relationship among integers

ii. Operations

iii. Polynomial algebra with integer coefficients

iv. Solving linear equations involving integers

f. Fractions

i. Least common multiples

ii. Operations

iii. Applications

iv. Polynomial algebra with fractional coefficients

v. Solving linear equations involving fractions

g. Mixed numbers

i. Relation to fractions

ii. Operations

iii. Applications

h. Decimals

i. Operations

ii. Applications

iii. Polynomial algebra with decimal coefficients

iv. Solving linear equations involving decimals

v. Pythagorean Theorem

i. Percent

i. Conversion to and from percent

ii. The basic percent equation

iii. Applications of percent

j. Proportion

i. Solving proportions

ii. Applications of proportions

k. Equations in two variables

i. Rectangular coordinate system

ii. Solving linear equations in two variables

iii. Graphing linear equations in two variables

iv. Slopes and intercepts

B. ENROLLMENT RESTRICTIONS

1. Prerequisites

Satisfactory completion of MATH 10 or equivalent placement by MJC assessment process .

2. Advisories

Before enrolling in this course, students are strongly advised to have eligibility for READ 82 or higher

3. Requisite Skills

Before entering the course, the student will be able to:

a. Add, subtract, multiply, and divide whole numbers, fractions, and decimals.

C. HOURS AND UNITS

5 Units		
INST METHOD	**TERM HOURS**	**UNITS**
Lect	90.00000	5.00
Lab	00.00000	0
Disc	00.00000	0

D. METHODS OF INSTRUCTION (TYPICAL)

Instructors of the course might conduct the course using the following method:

1. Lectures, discussions, or other presentations
2. In-class activities
3. Demonstrations of mathematical techniques, applications, and problem-solving strategies by both instructor and students
4. Applications of material to specific problems

E. ASSIGNMENTS (TYPICAL)

1. EVIDENCE OF APPROPRIATE WORKLOAD FOR COURSE UNITS
Time spent on coursework in addition to hours of instruction (lecture hours)

Daily homework assignments requiring approximately two hours per class hour, daily review of class notes, ongoing review of class material, and several preparations throughout the term for the midterm exams and the final exams.

2. EVIDENCE OF CRITICAL THINKING
Assignments require the appropriate level of critical thinking

a. Solve $2x - 5 = 4x + 41$

b. Simplify $(2x - 3)(x + 7)$

c. Simplify $(3x^2 + 5x - 3) - (4x^2 - 3x + 2)$

d. Graph the equation $y = 2/3\ x - 4$

e. Evaluate $2x^2y + 4y$ when $x = -2/3$ and $y = 5/6$

f. Solve $2/3\ x - 1/6 = 1/2$

g. If it take 3 cups of blue paint and 4 cups of yellow paint to make green paint, how many cups of blue paint do you need to make 98 cups of green paint?

h. What is 75% of 110?

i. 60 miles per hour = ? feet per second

F. TEXTS AND OTHER READINGS (TYPICAL)

1. Book: Carson, Tom (2009). *Prealgebra* (3rd /e). Addison-Wesley.

III. DESIRED LEARNING

A. COURSE GOAL
As a result of satisfactory completion of this course, the student should be prepared to:

work with algebraic concepts and applications. They also should be prepared to take Math 50, Math 70, and/or Math 71.

B. STUDENT LEARNING GOALS
Mastery of the following learning goals will enable the student to achieve the overall course goal.

1. Required Learning Goals
Upon satisfactory completion of this course, the student will be able to:

a. use mathematical vocabulary correctly.

b. add, subtract, multiply, and divide with whole numbers, integers, fractions, mixed numbers, and decimals without the use of a calculator.

c. convert fractions to decimals and decimals to fractions without the use of a calculator.

d. solve applied problems involving percent.

e. add and subtract polynomials with integer, fraction, or decimal coefficients.

f. multiply polynomials by monomials.

g. determine the product of two binomials.

h. find the quotient of a polynomial and a monomial.

i. solve linear equations.

j. evaluate formulas for given values.

k. state and use appropriate formulas to calculate the perimeter, area, or volume of common geometric objects, using both the English and metric systems of measurement.

l. solve applied problems involving proportions.

m. graph linear equations in two variables.

n. solve right triangles using the Pythagorean Theorem.

o. find the absolute value of an integer or a rational number.

p. compare two numbers using inequality symbols.

q. evaluate an algebraic expression for given values of the variables.

r. find the average of a set of numbers.

s. solve problems using dimensional analysis techniques.

IV. METHODS OF ASSESSMENT (TYPICAL)

A. FORMATIVE ASSESSMENT

1. In-class activities
2. Assigned homework
3. Quizzes
4. Tests (non multiple choice, non true/false) given at regular intervals throughout the semester

B. SUMMATIVE ASSESSMENT

1. Comprehensive final examination (non multiple choice, non true/false) of at least two hours in length