Modesto Junior College
Course Outline of Record

MATH 71

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

**MATH 71**  **Elementary Algebra 1**  **3 Units**

First half of MATH 70 - Elementary Algebra. Topics include: simplifying algebraic expressions, solving linear equations, graphing lines, and solving systems of linear equations and inequalities, with application problems incorporated into each topic. **Prerequisite:** Satisfactory completion of MATH 20. or equivalent placement by MJC assessment process

Field trips are not required. **Units/Hours:** 3.00 Units: Lecture - 54.00 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. Review of the Real Numbers
      i. Properties
      ii. Arithmetic Operations
      iii. Order of Operations

   b. Linear Equations and Inequalities in One Variable
      i. Simplifying Expressions
      ii. Addition and Multiplication Properties of Equality
      iii. Solving Linear Equations in One Variable
      iv. Applications
      v. Inequalities
         a. Solving Linear Inequalities in One Variable
         b. Graphing Linear Inequalities on the Number Line
         c. Expressing Answer Using Interval Notations

   c. Linear Equations and Inequalities in Two Variables
      i. Graphing Linear Equations in Two Variables
      ii. Slope of a Line
iii. Graphing Linear Inequalities in Two Variables

iv. Introduction to Functions

d. Linear Systems
   i. Solving by Graphing
   ii. Solving by Substitution
   iii. Solving by Elimination by Addition
   iv. Dependent and Inconsistent Systems
   v. Graphing Systems of Linear Inequalities
   vi. Applications

e. Polynomials
   i. Degree and Number of Terms Classification
   ii. Addition, Subtraction, Multiplication, Division, and Powers of Polynomials
   iii. Special Products of Binomials
   iv. Factoring Polynomials
   v. Solving Equations by Factoring
   vi. Applications

B. ENROLLMENT RESTRICTIONS

1. Prerequisites
   Satisfactory completion of MATH 20 or equivalent placement by MJC assessment process.

2. Requisite Skills
   Before entering the course, the student will be able to:
   
   a. Use mathematical vocabulary correctly
   b. Compare two numbers using an inequality
   c. Demonstrate the ability to add, subtract, multiply, and divide with whole numbers, integers, fractions, mixed numbers, and decimals
   d. Demonstrate the ability to convert fractions to decimals and decimals to fractions
   e. Demonstrate the ability to convert fractions and decimals to percents and vice versa
   f. Solve applied problems involving percent
   g. Add and subtract polynomials with integer, fraction, or decimal coefficients
   h. Multiply polynomials by monomials
   i. Determine the product of two binomials
j. Find the quotient of a polynomial and a monomial
k. Solve linear equations
l. Evaluate expressions and formulas for given values
m. Translate simple verbal expressions to algebraic expressions
n. Evaluate absolute value expressions
o. Evaluating square roots of perfect squares without the aid of a calculator
p. Use the Pythagorean Theorem to find the length of a missing side in a right triangle
q. Plot points on a Rectangular Coordinate System
r. Find solutions of a linear equation in two variables
s. Graph a line

C. HOURS AND UNITS

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<th>INST METHOD</th>
<th>TERM HOURS</th>
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D. METHODS OF INSTRUCTION (TYPICAL)

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

1. Lecture
2. Discussion
3. Demonstration of mathematical techniques.
5. Homework assignments
6. Discussion of concepts with instructor and other students in class

E. ASSIGNMENTS (TYPICAL)

1. EVIDENCE OF APPROPRIATE WORKLOAD FOR COURSE UNITS

Time spent on coursework in addition to hours of instruction (lecture hours)

a. Daily homework assignments requiring on the average two hours per class hour
b. Daily review of class notes
c. Ongoing review of flashcards or study sheets
d. Preparation of examinations, several times during the term
e. Preparation of final examination
2. **EVIDENCE OF CRITICAL THINKING**
   Assignments require the appropriate level of critical thinking

   a. How many gallons of a 10% alcohol solution must be mixed with 8 gallons of a 20% solution to get a 12% solution?

   b. Jill's physics grade is based on the average of her five exam scores. Each exam is worth 100 points. Her first three scores are 72, 73, and 85. What is the lowest score that Jill can get on the fourth exam and still have a chance of averaging at least 80 on all five exams?

F. **TEXTS AND OTHER READINGS (TYPICAL)**

III. **DESIRED LEARNING**

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

   perform a wide variety of algebraic skills, starting from the concept of a variable and continuing through polynomials. In addition to the standard mechanical algebraic manipulations, students will also emphasize skills such as graphing and modeling. This will take place in an environment that consistently encourages students to not only improve their ability to calculate mentally, but also to use their new found skills to solve real world problems.

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. Demonstrate continuing mastery of all prerequisite skills
   b. Simplify arithmetic expressions using the correct order of operations
   c. Simplify algebraic expressions by combining like terms
   d. Solve linear equations in one variable
   e. Solve and graph linear inequalities in one variable
   f. Determine the slope of a line from either the graph or the equation and explain its meaning
   g. Graph linear equations and inequalities in two variables
   h. Write the equation of a line describing the relationship between two variables
   i. Solve systems of linear equations in two variables by the graphing method, the substitution method, or the elimination-by-addition method
   j. Solve systems of linear inequalities by graphing and shading
   k. Add, subtract, multiply, and divide polynomials
   l. Convert numbers to and from scientific notation and apply rules of exponents to these numbers

IV. **METHODS OF ASSESSMENT (TYPICAL)**
A. FORMATIVE ASSESSMENT

1. Midterm exams (excluding the following formats: multiple choice, open book, take home).
2. Quizzes
3. Homework assignments.
4. Participation

B. SUMMATIVE ASSESSMENT

1. Comprehensive 2 to 3 hour Final Exam (excluding the following formats: multiple choice, open book, take home)