

Modesto Junior College
Course Outline of Record
MATH 88

I. OVERVIEW

The following information will appear in the 2009 - 2010 catalog

MATH 88 Algebra with Applications

3 Units

Designed as an alternative to Math 90 for students pursuing an AA or AS degree and not intending to transfer. Topics include linear equations, linear inequalities, and applications; quadratic equations and applications; exponential equations and applications; solving systems of linear equations and applications; probability.

Prerequisite: Satisfactory completion of MATH 70 or MATH 71 and MATH 72. 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. Linear Equations and Linear Inequalities
 - i. Graphing lines
 - ii. Writing equations of lines
 - iii. Linear modeling in applications
 - iv. Linear programming
- b. Quadratic Equations
 - i. Completing the square
 - ii. Quadratic formula
 - iii. Applications
 - a. Number problems
 - b. Geometry problems
 - c. Minimum and maximum problems
 - iv. Equations of circles and parabolas
 - v. Graphing circles and parabolas
- c. Exponential Functions

- i. Graph exponential functions
- ii. Solve exponential equations
- iii. Applications
 - a. Compound interest problems
 - b. Exponential decay problems
 - c. Law of exponential growth problems
 - d. Financial analysis problems

- d. 3 x 3 Systems of Linear Equations
 - i. Substitution
 - ii. Elimination by addition
 - iii. Applications

- e. Probability
 - i. Simple probability calculations

2. Recommended Content:

- a. Probability
 - i. Expected value
 - ii. Counting techniques

B. ENROLLMENT RESTRICTIONS

1. Prerequisites

Satisfactory completion of MATH 70 or MATH 71 and MATH 72 or equivalent placement by MJC assessment process .

2. Requisite Skills

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

- a. Simplify arithmetic expressions
- b. Solve and graph linear equations and inequalities in one variable
- c. Solve systems of linear equations and inequalities in two variables
- d. Perform polynomial arithmetic

- e. Factor polynomials
- f. Solve quadratic equations
- g. Perform rational expression arithmetic and solve equations involving rational expressions
- h. Simplify radicals and expressions involving radicals and solve equations involving radical expressions
- i. Sketch the graph of simple parabolas from their equations
- j. Create mathematical models of applications described in words
- k. Convert numbers to and from scientific notation

C. HOURS AND UNITS

3 Units		
INST METHOD	TERM HOURS	UNITS
Lect	54.00000	3.00
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. Lecture
- 2. Discussion
- 3. Demonstration of mathematical techniques
- 4. Guided practice
- 5. Homework assignments

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 flashcards or study sheet
- Preparation for examinations, several times during the term
- Preparation for final examination

2. EVIDENCE OF CRITICAL THINKING

Assignments require the appropriate level of critical thinking

Joe received \$25,500 from an inheritance. He wishes to use the money in five years for the down payment on a house. If he deposits the money in a savings account paying 5% compounded quarterly, then

- 1. how much will his investment be worth in five years?
- 2. what will be the maximum purchase price of the house Joe can afford if the down payment will be 10% of the purchase price (ignore other costs associated with the purchase)?

A farmer has 120 rods of fencing and wants to enclose a rectangular plot of land that requires fencing on only three sides because it is bounded on one side by a river.

1. Find the length and the width of the plot that will maximize the area
2. Find the maximum area.

F. TEXTS AND OTHER READINGS (TYPICAL)

1. **Book:** Rockswold & Krieger (2009). *Intermediate Algebra with Applications & Visualization* (3/e). Addison Wesley.

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 with applications. In addition to solving various types of equations and systems of equations, the student will be able to model these situations in the real world. Also, the student will be able to apply concepts of probability to the real world.

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. Graph linear equations and inequalities in two variables
- c. Write the equation of a line describing the relationship between two variables
- d. Solve quadratic equations by completing the square and the quadratic formula
- e. Solve applications of quadratic equations in the setting of number problems, geometry problems, and minimum and maximum problems
- f. Write the equation of circles and parabolas
- g. Graph circles and parabolas
- h. Graph exponential functions
- i. Solve exponential equations
- j. Solve problems with applications using exponential functions including compound interest, exponential decay, law of exponential growth, and financial analysis
- k. Solve 3 x 3 systems of linear equations by substitution, elimination by addition, and applications
- l. Compute simple probabilities

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)