



El Camino College
COURSE OUTLINE OF RECORD – Official

Course Acronym:	MATH
Course Number:	140
Descriptive Title:	Finite Mathematics for Business and Social Sciences
Division:	Mathematical Sciences
Department:	Mathematics
Course Disciplines:	Mathematics
Catalog Description:	This course consists of a study of functions, matrices, linear programming, sets, combinatorics, probability, statistics, mathematics of finance, and Markov chains.
Prerequisite:	Proficient in intermediate algebra
Co-requisite:	
Recommended Preparation:	
Enrollment Limitation:	
Hours Lecture (per week):	4
Hours Laboratory (per week):	0
Outside Study Hours:	8
Total Course Hours:	72
Course Units:	4
Grading Method:	Letter Grade only
Credit Status:	Credit, degree applicable
Transfer CSU:	Yes
Effective Date:	prior to 1992
Transfer UC:	Yes
Effective Date:	prior to 1992
General Education:	Area 4B - Language and Rationality: Communication and Analytical Thinking, Area 6 -
ECC	Mathematics Competency
Term:	
Other:	
CSU GE:	Area B4 - Physical Universe and its Life Forms: Mathematics/Quantitative Reasoning
Term:	
Other:	
IGETC:	Area 2A - Mathematical Concepts and Quantitative Reasoning
Term:	

Other:	
CalGETC:	
Term:	
Other:	
Student Learning Outcomes:	SLO #1 Use of Gauss-Jordan Use the Gauss-Jordan technique to solve systems of linear equations. SLO #2 Use of Matrices Solve problems using matrices. SLO #3 Use of Geometrical Approach Solve linear programming problems using the geometrical approach. SLO #4 Use of Finite Mathematics Techniques Solve application problems using finite mathematics techniques.
Course Objectives:	1. Use linear, exponential, and logarithmic functions to model problems from business and the social sciences. 2. Write and solve systems of linear equations for applied problems by the Gauss-Jordan method. 3. Perform matrix operations, find the inverse of a square matrix, and using the inverse to solve a system of linear equations. 4. Use graphical linear programming methods to optimize linear functions subject to a set of constraints. 5. List the elements in the intersection, union, difference and complements of sets. 6. Determine the number of elements in a finite set using the inclusion-exclusion principle, the complement principle, Venn diagrams, the multiplication principle, permutations, and combinations, as needed. 7. Find the probability and the conditional probability of a given event. 8. Find the expected value of a random variable. 9. Compute the mean, the variance, and the standard deviation for a given set of data. 10. Write a transition matrix for a Markov chain, compute the state vector after k transitions, and compute the stable state vector. 11. Solve applied problems in finance including simple and compound interest, future and present value, annuities, sinking funds, and amortization.
Major Topics:	I. APPLICATIONS OF LINEAR FUNCTIONS (8 hours, lecture) A. Review the Cartesian plane and graphing equations of lines B. Applications of linear functions to economics such as cost, revenue, and profit functions, supply and demand equations, break-even point, and free market equilibrium C. Relating geometric and algebraic solutions to systems of two linear equations II. MATRICES (14 hours, lecture) A. Systems of linear equations and augmented matrices

- B. Gauss-Jordan elimination
- C. Matrix algebra
- D. Inverse of a square matrix
- E. Solving matrix equations and their applications

III. LINEAR PROGRAMMING (8 hours, lecture)

- A. Solve linear programming problems as mathematical models
- B. Solve linear inequalities in two or three variables
- C. Graphical solutions of linear programming problems

IV. SETS AND COUNTING TECHNIQUES (6 hours, lecture)

- A. Use DeMorgan's laws to negate a compound statement.
- B. List the elements in the intersection, union, difference, and complements of sets.
- C. Use Venn diagrams to compute the cardinality of compound sets.
- D. The multiplication principle for counting
- E. Permutations and combinations

V. PROBABILITY (10 hours, lecture)

- A. Equally likely outcomes
- B. Outcomes with unequal probability
- C. Odds
- D. Conditional probability
- E. Addition rule for probability and mutually exclusive events
- F. Multiplication rule for probability and independent events
- G. Bayes' Theorem
- H. Random variables, probability distributions, and expected value

VI. STATISTICS (8 hours, lecture)

- A. Organizing and displaying data
- B. Measures of central tendency
- C. Measures of dispersion
- D. Bernoulli Trials and binomial experiments
- E. Normal distributions

VII. MARKOV CHAINS (6 hours, lecture)

- A. The transition matrix and its properties
- B. Regular Markov chains

VIII. MATHEMATICS OF FINANCE (12 hours, lecture)

- A. Exponential and logarithmic functions
- B. Simple interest
- C. Compound interest
- D. Future and present value
- E. Annuities and sinking funds
- F. Amortization

Total Lecture Hours:	72
Total Laboratory Hours:	0
Total Hours:	72
A.1. Primary Methods of Evaluation (Part 1 - CCN courses only):	
A.2. Primary Method of Evaluation (Part 2 - all courses; choose one):	2) Problem solving demonstrations (computational or non-computational)
Typical Assignment Using Primary Method of Evaluation:	At the Boy Scout camp council, there are two boys from each of the states Iowa, New Mexico, Florida, and Maine. In how many ways can a committee of four be formed from among these boys, in which there is at least one boy from Maine?
Critical Thinking Assignment 1:	A dietitian is to prepare two foods in order to meet certain requirements. Each pound of Food A contains 100 units of vitamin C, 40 units of vitamin D, 10 units of vitamin E, and costs \$0.20. Each pound of Food B contains 10 units of vitamin C, 80 units of vitamin D, 5 units of vitamin E, and costs \$0.15. Any mixture of Food A and Food B is delicious! The dietitian must produce a mixture that contains at least 260 units of vitamin C, at least 320 units of vitamin D, and at least 50 units of vitamin E. How many pounds of each type of food should be used in order to minimize the cost?
Critical Thinking Assignment 2:	The voting population in Mt Vernon remains rather constant at 12,000. From election to election, the changes among Democrats, Republicans, and Independents are as shown in the transition matrix below (the rows represent this election, the columns represent next election): Dem Rep Ind Dem 0.80 0.15 0.05 Rep 0.08 0.90 0.02 Ind 0.20 0.15 0.65 In the long run, how many voters will each party have?
Other Evaluation Methods:	Homework Problems, Other Exams, Quizzes
Instructional Methods:	Lecture
If other:	
Work Outside of Class:	Problem solving activity, Required reading, Study
If Other:	
Up-To-Date Representative Texts:	Barnett, Ziegler, Byleen and Stocker. <u>FINITE MATHEMATICS FOR BUSINESS, ECONOMICS, LIFE SCIENCES AND SOCIAL SCIENCES</u> , 14 th ed., Pearson 2021.
Alternative Texts:	

Required Supplementary Readings:	
Other Required Materials:	
Requisite:	
Category:	
Requisite course(s): List both prerequisites and corequisites in this box.	
Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).	
Requisite Skill:	qualification by testing and assessment
Requisite Skill and Matching Skill(s): Bold the requisite skill(s). If applicable	
Requisite course:	
Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).	
Requisite Skill:	
Requisite Skill and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s). If applicable	
Enrollment Limitations and Category:	
Enrollment Limitations Impact:	
Course Created by:	A. Filman
Date:	05/01/1975
Original Board Approval Date:	

Last Reviewed and/or Revised by:	Benjamin Mitchell
Date:	10/28/2025
Last Board Approval Date:	1/21/2026
Effective Term:	FA 2026