College of San Mateo
Official Course Outline

1. **COURSE ID:** MATH 125 **TITLE:** Elementary Finite Mathematics **C-ID:** MATH 130
   Units: 3.0 units **Hours/Semester:** 48.0-54.0 Lecture hours; and 96.0-108.0 Homework hours
   Method of Grading: Letter Grade Only
   Prerequisite: MATH 120 or placement by other college approved methods.

2. **COURSE DESIGNATION:**
   Degree Credit
   Transfer credit: CSU; UC
   AA/AS Degree Requirements:
   CSM - COMPETENCY REQUIREMENTS: C1 Math/Quantitative Reasoning Basic Competency
   CSM - GENERAL EDUCATION REQUIREMENTS: E2b. Communication and Analytical Thinking
   CSU GE:
   CSU GE Area B: SCIENTIFIC INQUIRY AND QUANTITATIVE REASONING: B4 - Mathematics/Quantitative Reasoning
   IGETC:
   IGETC Area 2: MATHEMATICAL CONCEPTS AND QUANTITATIVE REASONING: A: Math

3. **COURSE DESCRIPTIONS:**
   Catalog Description:
   An introduction to finite mathematics, including linear functions, systems of linear equations and inequalities, matrices, linear programming, mathematics of finance, sets and Venn diagrams, combinatorial techniques and an introduction to probability. Applications in business, economics and social sciences.

4. **STUDENT LEARNING OUTCOME(S) (SLO'S):**
   Upon successful completion of this course, a student will meet the following outcomes:
   1. Apply linear and exponential graphs and functions;
   2. Write a system of linear equations to solve applied problems;
   3. Solve a system of linear equations using Gauss-Jordan elimination and interpret the result;
   4. Find the inverse of a square matrix and use the inverse to solve a system of linear equations;
   5. Solve linear programming problems in at least three variables;
   6. Find unions, intersections and complements of sets and use Venn diagrams to solve problems;
   7. Apply basic combinatorial principles to enumeration problems;
   8. Determine the probability of a specified event;
   9. Find the conditional probability of an event; and
   10. Solve applied problems in finance including simple and compound interest, future and present value, annuities, sinking funds, and amortization.

5. **SPECIFIC INSTRUCTIONAL OBJECTIVES:**
   Upon successful completion of this course, a student will be able to:
   1. Apply linear and exponential graphs and functions;
   2. Write a system of linear equations to solve applied problems;
   3. Solve a system of linear equations using Gauss-Jordan elimination and interpret the result;
   4. Find the inverse of a square matrix and use the inverse to solve a system of linear equations;
   5. Solve linear programming problems in at least three variables;
   6. Find unions, intersections and complements of sets and use Venn diagrams to solve problems;
   7. Apply basic combinatorial principles to enumeration problems;
   8. Determine the probability of a specified event;
   9. Find the conditional probability of an event; and
   10. Solve applied problems in finance including simple and compound interest, future and present value, annuities, sinking funds, and amortization.

6. **COURSE CONTENT:**
   Lecture Content:
   1. Linear equations and functions;
   2. Exponential and logarithmic functions and their applications;
   3. Applications of linear functions to economics such as cost, revenue and profit functions, supply and

demand equations, break-even point, and free market equilibrium;
4. Systems of linear equations;
5. Matrices including matrix algebra, Gauss-Jordan elimination and reduced-row echelon form, inverse matrices, and applications;
6. Linear programming;
7. Math of finance including simple and compound interest, future and present value, annuities, sinking funds, and amortization;
8. Set theory including DeMorgan's Laws and Venn diagrams; and
9. Probability and combinatorics including permutations and combinations; finding the probability of an event given the probabilities of the simple events in a sample space; conditional probability.

7. **REPRESENTATIVE METHODS OF INSTRUCTION:**
Typical methods of instruction may include:
   A. Lecture
   B. Other (Specify): Examples of instructor- initiated strategies that will assist students in meeting the course objectives include: a. Out-of-class assignments: students will need to complete assigned problems and projects. b. Reading assignments: Instructor may assign text readings for discussion of a topic in class. c. Writing assignments: 1. Students will submit written and/or online homework assignments. 2. Students may be assigned papers including mathematical modeling. d. Critical thinking: 1. Lecture/discussion to understand problem-solving process. 2. Students may practice critical thinking in small group problem solving. 3. Students evaluate proposed solutions in light of problem constraints. e. Resources available on CD and the internet may be used to augment the text.

8. **REPRESENTATIVE ASSIGNMENTS**
Representative assignments in this course may include, but are not limited to the following:
Writing Assignments:
Students will submit written and/or online homework assignments. Students may be assigned papers including mathematical modeling.
Reading Assignments:
Instructor may assign text readings for discussion of a topic in class.
Other Outside Assignments:
Students will need to complete assigned problems and projects.

9. **REPRESENTATIVE METHODS OF EVALUATION**
Representative methods of evaluation may include:
   A. Class Participation
   B. Exams/Tests
   C. Group Projects
   D. Homework
   E. Written examination
   F. Written individual assignments and/or journal- to demonstrate individual student progress toward objectives. Small group presentations - to demonstrate student participation in problemsolving process. Written exams/quizzes - to reflect student knowledge of vocabulary, concepts, and application of concepts to problem-solving as presented in lectures and discussion, small group sessions, and text readings. Final Examination - to reflect student cumulative knowledge of vocabulary, concepts, and applications of concepts to problem-solving as presented in lectures and discussions, small group sessions, and text readings. Participation - to reflect student involvement in class discussions, small group sessions and presentations, etc.

10. **REPRESENTATIVE TEXT(S):**
Possible textbooks include:
   A. Goldstein, L., D. Schneider and M. Siegel. *Finite Math and Its Applications*, ed. Pearson, 2018
   B. Lial, Margaret, R. Greenwell, and N. Ritchey. *Finite Mathematics*, ed. Pearson, 2018
   C. Barnett, R., M. Ziegler, and K. Byleen. *Finite Mathematics for Business, Economics, Life Sciences and Sociology*, ed. Pearson, 2018

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Course Originator: Christopher Walker