

# Lassen Community College Course Outline

## MATH-6 Finite Mathematics

3.0 Units

### I. Catalog Description

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, economic and social sciences. This course has been approved for online, correspondence, and hybrid delivery. Access to a computer with internet access is required.

**Prerequisite(s):** Completion of Math 60-Intermediate Algebra with a grade of 'C' or better or the equivalent multiple measures placement.

#### Math 60 Prerequisite Skills:

1. Finding the equations of linear functions.
2. Solving linear systems of equations.
3. Apply the real number properties to simplify numeric and algebraic expressions.
4. Add, subtract, multiply, divide, and factor polynomials.
5. Solve linear and quadratic equations.
6. Graph lines and use functional notation.
7. Solve systems of linear equations by the elimination, substitution, and graphing methods.
8. Add, subtract, multiply, and divide radical expressions.
9. Solve radical equations.
10. Add, subtract, multiply, and divide rational expressions.
11. Solve rational equations.

Transfers to CSU

51 Hours Lecture

Scheduled: Fall/Spring

### II. Coding Information

Repeatability: Not Repeatable, Take 1 Time

Grading Option: Graded or Pass/No Pass

Credit Type: Credit - Degree Applicable

TOP Code: 170100

### III. Course Objectives

#### A. Course Student Learning Outcomes

Upon completion of this course the student will be able to:

1. Analyze and solve finite math problems by the appropriate application of the principles of: matrices, linear programming, logic, and sets.
2. Analyze and solve finite math problems by the appropriate application of the principles of: probability and statistics, mathematics of finance.

#### B. Course Objectives

Upon completion of this course the student will be able to:

1. Write and graph linear equations and functions.
2. Apply linear and exponential graphs and functions.
3. Develop a system of linear equations to solve applied problems.
4. Solve a system of linear equations using Gauss-Jordan elimination and interpret the results.
5. Perform the arithmetic operations on matrices.
6. Find the inverse of a square matrix and use the inverse to solve a system of linear equations.
7. Solve linear programming problems in at least three variables.
8. Find unions, intersections and complements of sets and use Venn diagrams to solve problems.
9. Apply basic combinatorial principles.
10. Determine the probability of a specified event.
11. Find the conditional probability of an event.
12. Solve applied problems in finance including simple and compound interest, future and present value, annuities, sinking funds, and amortization.

#### **IV. Course Content**

- A. Linear equations and functions.
- B. Exponential and logarithmic functions and their applications.
- C. Applications of linear functions to economics such as cost, revenue and profit functions, supply and demand equations, break-even point, and free market equilibrium.
- D. Solving systems of linear equations.
- E. Matrices including matrix algebra, Gauss-Jordan elimination and reduced-row echelon form, inverse matrices, and applications.
- F. Graphical and Simplex methods of Linear programming.
- G. Math of finance including simple and compound interest, future and present value, annuities, sinking funds, and amortization.
- H. Logic and Set theory including DeMorgan's Laws and Venn diagrams.
- I. 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.

#### **V. Assignments**

##### **A. Appropriate Readings**

Students will be required to read and study assigned chapters in the textbook.

Supplemental readings are generally not used, but may be assigned.

##### **B. Appropriate Writings**

1. Prepare for class and review material and concepts presented in class.
2. Complete homework assignments, including applications of representative symbols and systems and/or application problems.
3. Understand and apply the theories and techniques taught in the class.

##### **C. Expected Outside Assignments**

Students are expected to spend a minimum of 2 hours outside of class in practice and preparation for each hour of class. Assignments may include: reading the text, application of formulas and theorems, research on topics presented, and practice problems from the text.

##### **D. Specific Assignments that Demonstrate Critical Thinking**

Students will solve a variety of problems requiring the use of matrix operations to solve linear systems of equations, where they will be required to interpret their results within the context of the problem. Students will also be required to apply probability calculation strategies to specific events, as well as solve applied problems in finance including simple and compound interest, future and present value annuities, and amortization. Multiple measures of student performance including in-class, out-of-class work, exams/midterm, and final exam.

## **VI. Methods of Evaluation**

### **Traditional Classroom Evaluation**

Tests, examinations, homework or projects where students demonstrate their mastery of the learning objectives and their ability to devise, organize and present complete solutions to problems and a comprehensive final.

### **Online Evaluation**

A variety of methods will be used, such as: research papers, asynchronous and synchronous discussions (chat/forum), online quizzes and exams, postings to online website, email communications, and digital homework completions.

### **Hybrid Evaluation**

A combination of traditional classroom and online instruction will be utilized. Each semester a 34 hours will be taught face-to face by the instructor and 17 hours will be instructed online through the technology platform adopted by the District. Traditional class instruction will consist of exercises/assignments, lectures, visual aids, and practice exercises. Online delivery will consist of exercises/assignments, lecture posts, discussions, adding extra resources and other media sources as appropriate.

### **Correspondence Evaluation**

Students will be expected to complete assignments and activities equivalent to in-class assignments and activities. Written correspondence and a minimum of six opportunities for feedback will be utilized to maintain effective communication between instructor and student.

## **VII. Methods of Delivery**

Check those delivery methods for which, this course has been separately approved by the Curriculum/Academic Standards Committee.

**Traditional Classroom Delivery**                       Hybrid Delivery

Online Delivery     Correspondence Delivery

### **Traditional Classroom Instruction Delivery**

Traditional Classroom Instruction consisting of (but not limited to) lecture, questions and answers, laboratory, demonstrations, discussion, and computer assisted instruction.

### **Correspondence Delivery**

Assigned readings, instructor-generated typed handouts, typed lecture materials, exercises and assignments equal to face to face instructional delivery. Written

correspondence and a minimum of six opportunities for feedback will be utilized to maintain effective communication between instructor and student.

### **Hybrid Delivery**

A combination of traditional classroom and online instruction will be utilized. Each semester a minimum of 17 hours will be taught face-to face by the instructor and the remaining hours will be instructed online through the technology platform adopted by the District. Traditional class instruction will consist of exercises/assignments, lectures, visual aids, and practice exercises. Online delivery will consist of exercises/assignments, lecture posts, discussions, adding extra resources and other media sources as appropriate.

### **Online Delivery**

Participation in forum based discussions, online exercises/assignments contained on website, web based video vignettes and lectures, email communications, postings to forums, online lecture notes and web links will compromise the method of instruction.

## **VIII. Representative Texts and Supplies**

### **All Delivery Modalities**

Required:

Lial, Hungerford, Holcomb, and Mullins; *Finite Mathematics*, 12<sup>th</sup> Edition, 2022, Pearson Education. This textbook may be rented in a cloth/paper bound version, ISBN: 978-0-135-882-627 or as an eText version, ISBN 978-0-137-423-804 both without MyLab Math

When a Math 6 section requires the use of MyLab Math, the eText and MyLab may be purchased separately, ISBN 978-0-137-423-804, or as a bundle with MyLab Math, ISBN 978-0-137-342-532 (18 week eText and MyLab access) or ISBN 978-0-135-882-702 (24 month eText and MyLab access).

Supplies: Scientific or Graphing Calculator.

## **IX. Discipline/s Assignment**

Mathematics

## **X. Course Status**

Current Status: Active

Original Approval Date: 05/25/2021

Board Approval: 06/08/2021

Chancellor's Office Approval: 07/15/2021

Revised By: Robert Schofield

Curriculum/Academic Standards Committee Revision Date: 05/17/2022