GAVILAN COLLEGE
5055 Santa Teresa Blvd
Gilroy, CA 95023

# Course Outline

**COURSE:** MATH 7 DIVISION: 20 ALSO LISTED AS:

TERM EFFECTIVE: Spring 2021 CURRICULUM APPROVAL DATE: 12/8/2020

SHORT TITLE: FINITE MATHEMATICS

LONG TITLE: Finite Mathematics

| Units | Number of Weeks | Type | Contact Hours/Week | Total Contact Hours |
|---|---|---|---|---|
| 3 | 18 | Lecture: | 3 | 54 |
| | | Lab: | 0 | 0 |
| | | Other: | 0 | 0 |
| | | Total: | 3 | 54 |

| | |
|---|---|
| Out of Class Hrs: | 108.00 |
| Total Learning Hrs: | 162.00 |

**COURSE DESCRIPTION:**

Systems of linear equations and matrices, introduction to linear programming, finance, counting techniques and probability, properties of probability and applications of probability. PREREQUISITE: Mathematics 235 OR Mathematics 240 OR equivalent with a grade of "C" or better.

PREREQUISITES:

Completion of MATH 233, as UG, with a grade of C or better.
OR
Completion of MATH 233B, as UG, with a grade of C or better.
OR
Completion of MATH 235, as UG, with a grade of C or better.
OR
Completion of MATH 240, as UG, with a grade of C or better.
OR
Completion of MATH 3, as UG, with a grade of C or better.
OR
Completion of MATH 5, as UG, with a grade of C or better.
OR
Completion of MATH 6, as UG, with a grade of C or better.
OR
Completion of MATH 8A, as UG, with a grade of C or better.

OR
Completion of MATH 8B, as UG, with a grade of C or better.
OR
Completion of MATH 12, as UG, with a grade of C or better.
OR
Completion of MATH 14, as UG, with a grade of C or better.
OR
Completion of MATH 1A, as UG, with a grade of C or better.
OR
Completion of MATH 1B, as UG, with a grade of C or better.
OR
Completion of MATH 1C, as UG, with a grade of C or better.
OR
Score of 33 on Intermediate Algebra
OR
Score of 13 on Pre-Calculus
OR
Score of 2700 on Accuplacer Math
OR
Score of 2600 on MM CCCApply Math
OR
Score of 2600 on MM Placement Tool Math

COREQUISITES:

CREDIT STATUS: D - Credit - Degree Applicable

GRADING MODES
L - Standard Letter Grade

REPEATABILITY: N - Course may not be repeated

SCHEDULE TYPES:
02 - Lecture and/or discussion
05 - Hybrid
71 - Dist. Ed Internet Simultaneous
72 - Dist. Ed Internet Delayed

**STUDENT LEARNING OUTCOMES:**

1. Demonstrate proficiency in using rectangular coordinates, graphing linear equations in two variables, applying linear equations to determine break-even point, and market price for supply/demand equations and other applications found in business and social science.

Measure of assessment: Homework, small group assignments, exams

2. Solve systems of equations using substitution, elimination, and matrix methods. Solve application problems.

Measure of assessment: Homework, small group assignments, exams

3. Demonstrate skills in basic matrix algebra to include addition, subtraction, multiplication and with a calculator.

4. Apply a geometric approach (graphing) to solve linear programming problems limited to two variables. Solve application problems.

Measure of assessment: Homework, small group assignments, exams

5. Apply the Simplex Method (matrix method) to solve linear programming (maximization and minimization) problems in standard form. Solve application problems.

Measure of assessment: Homework, small group assignments, exams

6. Demonstrate skill in solving finance problems to include simple interest, compound interest, ordinary annuities, future value, sinking funds, and amortization. Solve application problems related to topics mentioned above.

Measure of assessment: Homework, small group assignments, exams

7. Use properties of sets, the Multiplication Principle, combinations, permutations, and other counting techniques to determine probability. Use/ apply DeMorgan's laws. Determine the conditional probability of an event. Solve application problems.

**COURSE CONTENT:**

Curriculum Approval Date: 12/8/2020

**DE MODIFICATION ONLY**

6 Hours

CONTENT: Content: Introduction, rectangular coordinates, equations of lines and
applications: Breakeven analysis, and other applications found in business and
social science. Use the calculator to find the linear equation that best fits a set of data.
Exponential and logarithmic functions and their applications.
STUDENT PERFORMANCE OBJECTIVES (SPO): Graph a Linear equation, Determine
the equation of the line given certain characteristics, distinguish the difference
between coincident, parallel, and perpendicular lines from their equations. Apply
linear models to predict outcomes, find break-even point, calculate the market
price, and other applications found in business and social science. Apply exponential graphs and functions
to problems in business and social science.
OUT-OF-CLASS ASSIGNMENTS: Problems from book

6 Hours

CONTENT: Solving systems of equations using substitution, elimination and
matrix methods (e.g. Gauss-Jordan) Do application problems.
SPO: Solve systems of linear equations using substitution, elimination, and
matrix methods. Employ these skills to set up and solve a variety of application
problems, including supply/demand analysis, profit/loss and breakeven analysis.

**COURSE CONTENT (CONTINUED):**

6 Hours

CONTENT: Operations with matrices (Scalar multiplication, addition, subtraction, and multiplication with applications. Inverse of a matrix, Solving systems of equations using inverses. Selected applications from Crytography.

SPO: Demonstrate skill in the addition, subtraction, and multiplication of matrices. Employ these skills in solving application problems.Demonstrate skill in computing the multiplicative inverse of a square matrix (if one exists.) Apply this skill to solve certain systems of linear equations. Use inverses to encode and decode cryptic messages, calculate production levels using a Leontief Model.

OUT-OF-CLASS ASSIGNMENTS: Review vocabulary, Rules, do assigned problems

3 Hours

CONTENT: Solve systems of linear inequalities, solve linear programming problems using a geometric approach (graphing), application problems.

SPO: Solve systems of linear inequalities by graphing. Utilize this skill to solve linear programming problems in two variables. Translate application problems into algebraic form and then solve.

OUT-OF-CLASS ASSIGNMENTS: Written homework, small group assignment to solve challenging application problem.

6 Hours

CONTENT: Introduction to the Simplex Method (Matrices) for solving linear programming problems. Solving standard maximization problems, Duality Principle to solve standard minimization problems, solving problems with mixed constraints. Application problems:

SPO: Distinguish between linear programming problems in standard form and those that are not. Solve standard maximization problems. Use the Duality Principle to solve standard minimization problems. Solve non-standard problems. Determine when a problem has no feasible solution and when a problem has no optimum solution. Solve application problems. Solve linear programming problems in at least three variables.

OUT-OF-CLASS ASSIGNMENTS: Assignment: Review of vocabulary, solution techniques, written homework, small group challenging problem, review for future exam.

9 Hours

CONTENT: Solving problems with simple interest, compound interest, ordinary annuities, sinking funds, present value using both the formulas and the calculator. Prepare an amortization table with/without the use of technology.

SPO: Apply various formulae and use the calculator to compute simple interest, compound interest, effective rate of interest, present values, annuities, sinking funds. Calculating the payment for an amortized loan. Compare mortgages. Calculate the balance on an amortized loan.

OUT-OF-CLASS ASSIGNMENTS: Review vocabulary, formulae. Written homework, small group problems. Written homework, small group assignment to prepare an extensive Amortization table using either graphing calculator or spreadsheet.

6 Hours
CONTENT: Vocabulary of sets, basic set operations, number of elements in a set, applications. Multiplication Principle, combinations, permutations, applications.
SPO: Demonstrate skill in using basic set operations of union, intersection, and complement. Recall the Counting Formula and employ it to calculate the number of elements in certain sets. Solve application problems asking for the number of elements is certain sets using Venn Diagrams, the counting formula, and set operations. Apply the Multiplication Principle, combinations, permutations to determine the number of elements in a set(or the number of possible outcomes of an experiment.)
OUT-OF-CLASS ASSIGNMENTS: Written homework, small group problems.
9 Hours
CONTENT: Sample spaces and the assignment of probability, properties of the probability of an event, probability problems using counting techniques.
SPO: Calculate the sample space for an experiment. Assign the probability to selected events related to the experiment.
OUT-OF-CLASS ASSIGNMENTS: Written homework, small group problems.
2 Hours
CONTENT: Final Exam: Comprehensive: Problems are selected to represent

**METHODS OF INSTRUCTION:**
Instruction is by lecture, class discussion, lecture demonstration, small group problem solving, and homework.

**OUT OF CLASS ASSIGNMENTS:**
Required Outside Hours: 108
Assignment Description:
1. Regularly assigned homework that requires students to analyze and study pertinent text material, solved examples and lecture notes.
2. Regularly assigned homework that requires students to apply the principles and skills covered in class by solving related problems.

**METHODS OF EVALUATION:**
Writing assignments
Percent of total grade: 10.00 %
Out-of-class projects.

Problem-solving assignments
Percent of total grade: 10.00 %
Homework, quizzes.

Objective examinations
Percent of total grade: 80.00 %
In-class written exams.

**REPRESENTATIVE TEXTBOOKS:**
Required Representative Textbooks
Barnett, Ziegler, Byleen. Required: Barnett, Ziegler, Byleen. Finite Mathematics 13th edition. Pearson 2015. Or other appropriate college level text.. Pearson,2015.
ISBN: ISBN-10: 0-321-94552-2

**ARTICULATION and CERTIFICATE INFORMATION**

Associate Degree:
GAV B4, effective 200470
CSU GE:
CSU B4, effective 200470
IGETC:
IGETC 2A, effective 200470
CSU TRANSFER:
Transferable CSU, effective 200470
Not Transferable
UC TRANSFER:
Transferable UC, effective 200470
Not Transferable

**SUPPLEMENTAL DATA:**

Basic Skills: N
Classification: Y
Noncredit Category: Y
Cooperative Education:
Program Status: 1 Program Applicable
Special Class Status: N
CAN: MATH12
CAN Sequence: XXXXXXXX
CSU Crosswalk Course Department: MATH
CSU Crosswalk Course Number: 7
Prior to College Level: Y
Non Credit Enhanced Funding: N
Funding Agency Code: Y
In-Service: N
Occupational Course: E
Maximum Hours:
Minimum Hours:
Course Control Number: CCC000249602
Sports/Physical Education Course: N
Taxonomy of Program: 170100