University of South Carolina
Carolina Core

MATHEMATICS 170
FINITE MATHEMATICS

BULLETIN INFORMATION
MATH 170 - Finite Mathematics (3 credit hours)
Course Description:
Elementary matrix theory; systems of linear equations; permutations and combinations; probability and Markov chains; linear programming and game theory
Prerequisites: placement code MB4-9, MC0-9, or MD0-9 required; earned by grade of C or better in MATH 111/111I, or by Algebra Placement Test

SAMPLE COURSE OVERVIEW
In mathematics, we have a unique opportunity to challenge, test, and develop our critical thinking skills through problem solving. In finite mathematics we will focus on problems involving linear optimization, computation of present and future values, counting problems that involve permutations and/or combinations, probability, and logic.
Examples include resource allocation problems, in which some parameter (such as profit) is optimized when subject to linear constraints. Another example would be computing the present value of the combination of an annuity (sequence of regular and equal payments subject to the effects of interest) and a lump sum payment. A combinatorial example is to use counting techniques to determine the probability of a specific poker hand.

ITEMIZED LEARNING OUTCOMES
Upon successful completion of Math 170, students will be able to:
1. Demonstrate the use of basic mathematics terms related to Matrices, Linear Programming, Financial Math, Combinatorics, Probability, and Logic.
2. Apply concepts and methods to problems involving linear optimization, computation of present and future values, various forms of permutations and combinations, probability, and logic problems.
3. Demonstrate ability to interpret and translate graphs, tables, and word problems into mathematics statements that can be solved using the above techniques together with basic algebra, geometry, and arithmetic.
4. Demonstrate ability to utilize a graphing calculator to solve problems, graph functions and interpret data.

SAMPLE REQUIRED TEXTS/SUGGESTED READINGS/MATERIALS
1. Warner and Constenoble: *Finite Mathematics, Fifth Edition*

SAMPLE ASSIGNMENTS AND/OR EXAM

1. **Homework:** This will be done and graded through Webassign. It will normally be due on Mondays at 11:59 AM.
2. **Tests, Quizzes, and Final Exam:** There will be 4 tests, a final exam, and a short weekly quiz.

SAMPLE COURSE OUTLINE WITH TIMELINE OF TOPICS, READINGS/ASSIGNMENTS, EXAMS/PROJECTS

Class 1: 1.1 Overview of functions

Class 2: 1.2 Functions and models, linear functions

Class 3: 1.3 Linear functions

Class 4: 1.4 Linear regression

Class 5: 2.1 Two equations in two unknowns

Class 6: 2.2 Using matrices to solve systems of equations

Class 7: 2.3 Applications of systems of linear equations

Class 8: 3.1 Matrix addition & scalar multiplication

Class 9: 3.2 Matrix multiplication

Class 10: 3.3 Matrix inversion

Class 11: 3.5 Input-output models

Class 12: Review

Class 13: Exam 1

Class 14: 4.1 Graphing linear inequalities

Class 15: 4.2 Solving linear programming problems graphically

Class 16: 4.3 The simplex method; solving standard maximization problems

Class 17: 4.3, 4.4

Class 18: 4.4 Solving general linear programming problems

Class 19: Appendix

A-1/A.2 Introduction to logic

Class 20: A-2/A.3 Introduction to logic

Class 21: 6.1 Sets and set operations

Class 22: 6.2 Cardinality

Class 23: 6.3 Addition and multiplication principles

Class 24: 6.4 Permutations and combinations

Class 25: Review

Class 26: Exam 2

Class 27: 7.1 Sample spaces and events

Class 28: 7.2 Relative frequency

Class 29: 7.3 Probability and models

Class 30: 7.4 Probability and counting techniques

Class 31: 7.5 Conditional probability and independence

Class 32: 7.6 Bayes Theorem and applications

Class 33: 8.1 Random variables and distributions

Class 34: 8.2 Bernoulli trials and binomial random variables

Class 35: 8.3 Measures of central tendency

Class 36: 8.4 Measures of dispersion

Class 37: 8.5 Normal distributions

Class 38: 5.1 Simple interest

Class 39: Review

Class 40: Exam 3

Class 41: 5.2 Compound interest

Class 42: Review

Final Exam **Final Exam according to University exam schedule**