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**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**