

**Departmental Syllabus**  
**Math 1630 – Finite Mathematics with Applications**

**Textbook:** Mathematics - An Applied Approach, 8<sup>th</sup> Edition, by Sullivan & Mizrahi

**Prerequisites:** MATH 15 or MATH 1530 or a mathematics proficiency level of 15 or above.

**Calculators:** Scientific calculator required. (NOTE: On occasion, individual instructors may restrict the use of any type of calculator.)

**Course Description:**

Part I Linear Algebra: coordinate systems and graphs, linear systems, matrices, linear programming (geometric and simplex methods).

Part II Probability: set theory, counting techniques, probability.

Extensive use is made of applications in the fields of business and economics.

**Topics and sections to be covered:**

**Part I Linear Algebra**

- 1.1 Rectangular Coordinates; Lines
- 1.2 Pairs of Lines
- 1.3 Applications: Prediction; Break-Even Point; Mixture Problems; Economics
  
- 2.1 Systems of Linear Equations: Substitution; Elimination
- 2.2 Systems of Linear Equations: Matrix Method
- 2.3 Systems of  $m$  Linear Equations Containing  $n$  Variables
- 2.4 Matrix Algebra
- 2.5 Multiplication of Matrices
- 2.6 The Inverse of a Matrix
- 2.7 Applications: Leontief Model (and as time permits, Cryptography; Accounting; The Method of Least Squares)
  
- 3.1 Systems of Linear Inequalities
- 3.2 A Geometric Approach to Linear Programming Problems
- 3.3 Applications
  
- 4.1 The Simplex Tableau; Pivoting
- 4.2 The Simplex Method: Solving Maximum Problems in Standard Form
- \*\* *The instructor should choose one of the following two sections.*
- 4.3 Solving Minimum Problems in Standard Form Using the Duality Principle
- 4.4 The Simplex Method with Mixed Constraints

## **Part II Probability**

- 6.1 Sets
- 6.2 The Number of Elements in a Set
- 6.3 The Multiplication Principle
- 6.4 Permutations
- 6.5 Combinations
- 6.6 The Binomial Theorem (as time permits)
  
- 7.1 Sample Spaces and the Assignment of Probabilities
- 7.2 Properties of the Probability of an Event
- 7.3 Probability Problems Using Counting Techniques
- 7.4 Conditional Probability
- 7.5 Independent Events
  
- 8.1 Bayes' Formula