

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

Textbook: Mathematics - An Applied Approach, 8th Edition, by Sullivan & Mizrahi

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

Calculators: A scientific calculator (such as one of the TI-30 models) or a graphing calculator (such as the TI-83, 84, 85, 86 or the TI-Nspire with TI-84 keypad) is required. For a student who does not already own a graphing calculator, it is recommended that a purchase of a graphing calculator be delayed until after the first class meeting, when an instructor will provide specific calculator requirements for that class. Calculators with Computer Algebra Systems (CAS), (e.g. the TI-89, TI-92 and TI-Nspire with CAS keypad, or their equivalent), are not allowed in any math classes. 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