

**Indiana University South Bend**  
**M118 Finite Mathematics Syllabus**  
**(August 2007)**

**Course Coordinator:** Morteza Shafii-Mousavi

**Textbook**      Finite Mathematics for Business, Economics, Life Sciences, and Social Sciences, Eleventh Edition, R.A. Barnett, M. R. Ziegler, & K.E. Byleen

**Contents**

**Chapter 4      Systems of Linear Equations**

- Matrices
- Augmented Matrices
- Gauss-Jordan Eliminations
- Matrices: Basic Operations
- Inverse of a Square Matrix
- Applications (at least two: Cryptography pp 232, Investment Analysis pp 240, Leontief Input-output Analysis pp 245)

**Chapter 5      Linear Inequalities and Linear Programming**

- System of Inequalities in Two Variables
- Linear Programming in Two Dimensions: Geometric Approach
- Optimization (Maximum and Minimum Problems)
- Applications (model and solve provided problems: Resource Allocation, Production Scheduling, Investment, Transportation, Nutrition pp 282 , 287 , 288)

**Chapter 6      Linear Programming: The Simplex Method**

- The Simplex Method: Standard Maximization Problem in standard form
  - Geometric Approach
  - Algebraic Approach
  - Simplex Tableau
- Applications (problems pp 314)
- Optional: The Dual Problem

**Chapter 7      Sets**

- Optional: Section 7-1 Logic
- Basic Counting Principles
- Permutations
- Combinations

**Chapter 8      Probability**

- Sample Spaces, Events, Probabilities, Odds
- Union, Intersection, and Complement of Events
- Conditional Probabilities, Intersection and Independence
- Bays' Formula: Tree Diagrams, Tables, Sets, Formula
- Random Variables, Probability Distribution, Expected Value
- Applications (e.g. quality control, decision making analysis, marketing research)

**Chapter 11 (optional)      Data Description: Graphing Data & Measures of Central Tendency**

**Pedagogical Suggestions:**

- **Sequence of coverage:** An instructor may choose one of the following orders to teach the materials (most colleagues have found the second order to be more effective):
  1. Chapters 4, 5, 6, 7, and 8, in this order
  2. Chapters 7, 8, 4, 5, and 6 in this order (optional: cover chapter 11 before chapter 8)
- **Emphasis:** An instructor should emphasis on concepts, computational skills, ideas, units, and problem solving.
- **Applications:** An objective of the course is to give the students experience in modeling and solving real-world problems to convince the students that mathematics is useful. In the textbook, almost every exercise set contains application problems applied to business, economics, life sciences, and social sciences. An instructor should choose appropriate applications, suitable for the students' field, for assignment.