MA 162 – FINITE MATHEMATICS AND ITS APPLICATIONS
COURSE OUTLINE

I. Linear Systems
   A. Solve linear systems of two or more variables by graphing, substitution, elimination or Gauss-Jordan methods.
   B. Recognize consistent, inconsistent, and dependent systems
   C. Write solutions in parametric form
   D. Set up and solve applied problems

II. Matrix Operations
   A. Recognize and be able to write coefficient matrices and augmented matrices
   B. Be able to define and identify square matrices, equal matrices, and matrices dimensions.
   C. Add and subtract matrices
   D. Perform scalar multiplication
   E. Perform matrix multiplication
   F. Find inverses
   G. Use inverses to solve systems

III. Linear Inequalities
   A. Graph inequalities
   B. Graph systems of inequalities
   C. Identify corner points and feasible regions
   D. Solve optimization problems by substituting corner points into objective functions.
   E. Identify standard maximization and minimization problems.
   F. Solve standard maximization simplex problems
   G. Solve duality problems using simplex
   H. Convert non-standard optimization problems to standard maximum problems:
      i. Problems with constraints
      ii. Problems with = constraints
      iii. Problems with negative numbers on the right-hand side of constraints
      iv. Problems with a minimized objective function.
   I. Identify simplex problems without a single solution
      i. Multiple solutions
      ii. Unbounded solutions
      iii. No solutions
   J. Solve applied optimization problems using simplex and/or graphing methods.

IV. Sets
   A. Use, define and identify setbuilder notation, empty or null set, universal set, equal sets, subsets, proper subsets, elements, union, intersection, complements, disjoint sets
   B. Use and solve applied problems with Venn Diagrams.
   C. Identify the number of elements in sets

V. Combinatorics
   A. Define and use the Multiplication Rule on applied counting problems.
   B. Define and use the Addition Rule on applied counting problems.
   C. Solve applied permutation problems.
   D. Solve applied combination problems

VI. Probability
   A. Identify and define experiment, outcome, trial, sample space, event, empirical probability, random outcomes

Approved Spring 2003
B. Find probabilities of equally likely events in applied problems
C. Find probabilities of compound events in applied problems
   i. union
   ii. intersection
   iii. complement
D. Define and identify mutually exclusive events and independent events.
E. Solve applied conditional probability problems.
F. Solve applied probability problems using Baye’s Rule

OPTIONAL
VII. Markov Chains
   A. Identify and define state matrices, transition matrices, markov chains, and steady-state matrices
   B. Solve applied problems involving Markov Chains
   C. Find steady-state matrices
   D. Identify regular matrices

VIII. Solve applied problems using Bernouilli’s Formula