MATH 1430 MATH FOR LIBERAL ARTS

3 Credits
Offered in Lab or Lecture Format
Prerequisite required (MATH 0600 or MATH 1420 with a grade of C or better or Appropriate Placement-Test Score)

Revised 04/19/93

SYLLABUS

I. **SETS**

- A. Methods of specifying sets
  - 1. Descriptive notation
  - 2. Roster notation
- B. Set membership and notation
- C. Special sets
  - 1. Universal set
  - 2. Empty set
- D. Cardinality of a set
  - 1. One-to-one correspondence
  - 2. Finite
  - 3. Infinite
- E. Subsets
  - 1. Definition and notation
  - 2. Types
    - a. Proper
    - b. Improper
- F. Operations on sets
  - 1. Union
  - 2. Intersection
  - 3. Complement
  - *4. Difference
- G. Venn diagrams
- *H. Cartesian product
- I. Applications: voting coalitions

II. **LOGIC**

- A. Statements
  - 1. Definition
  - 2. Examples
- *B. Quantifiers
  - 1. Universal
  - 2. Existential
  - 3. Truth value of quantified statements
- C. Basic connectives
  - 1. Four types
    - a. Conjunction
    - b. Disjunction
    - c. Conditional
    - d. Biconditional
  - 2. Examples
  - 3. Combining connectives
  - 4. Truth tables

D. Variants of the conditional
   1. Converse
   2. Inverse
   3. Contrapositive

*E. Additional connectives

F. Uses of truth tables
   1. Identification of tautologies, contradictions, contingencies
   2. Determination of the validity of an argument
   *3. Truth tables and Venn Diagrams

G. Syllogisms using Venn Diagrams

III. PROBABILITY

A. Elementary experiments

B. Definitions
   1. Sample space
   2. Random variable
   3. Event
   4. Probability of an event

C. Simple examples and examples involving permutations and combinations

D. Additive principle of probability

E. Multiplicative principle of probability

*F. Mathematical expectation

IV. COUNTING TECHNIQUES

A. Multiplicative counting principle

B. Permutations
   1. Permutation of n objects taken n at a time
   2. Permutations of n objects taken r at a time
   3. Permutations of objects some of which are alike
   *4. Circular permutations

C. Combinations

V. STATISTICS

A. Three measures of central tendency (grouped & ungrouped)
   1. Mean
   2. Median
   3. Mode

B. Measures of dispersion
   1. Range
   2. Variance
   3. Standard deviation

C. Frequency distribution and frequency polygons

D. Percentiles

E. Normal curve

F. Z scores

*VI. NATURE OF COMPUTERS

A. History of computers
B. Uses of computers
C. Flow charts (incorporate with simple programming)
D. Programming languages: introduction of programming language, i.e. Basic
E. Mathematical applications of a programming language, i.e. Basic

*Optional