Math 2220 Discrete Mathematics

Schedule: Offered in Fall and Spring.

Course description: Logic, methods of proof, introduction to set theory, relations, functions, algorithms, counting techniques, graph theory, and trees. Credit not given for both MATH 2220 and MATH 3220.

Prerequisite: C or better in Math 1260, Math1310, or Math 1350.

Textbook: Discrete mathematical Structures, fifth edition 2004
Authors: Kolman, Busby, and Ross
Publisher: Prentice Hall

The covered subjects of this course are given from Chapter 1 to Chapter 8 of this textbook. The table of contents entries for these chapters are:

1. Fundamentals.
Sets and Subsets. Operations on Sets. Sequences. Properties of Integers. Matrices. Mathematical Structures.

2. Logic.
Propositions and Logical Operations. Conditional Statements. Methods of Proof. Mathematical Induction.

3. Counting.
Permutations. Combinations. Pigeonhole Principle. Elements of Probability. Recurrence Relations.

4. Relations and Digraphs.
Product Sets and Partitions. Relations and Digraphs. Paths in Relations and Digraphs. Properties of Relations. Equivalence Relations. Computer Representation of Relations and Digraphs. Operations on Relations. Transitive Closure and Warshall's Algorithm.

5. Functions.
Functions. Functions for Computer Science. Growth of Functions. Permutation Functions.

6. Order Relations and Structures.
Partially Ordered Sets. Extremal Elements of Partially Ordered Sets. Lattices. Finite Boolean Algebras. Functions on Boolean Algebras. Circuit Design.

7. Trees.
Trees. Labeled Trees. Tree Searching. Undirected Trees. Minimal Spanning Trees.

8. Topics in Graph Theory.

Graphs. Euler Paths and Circuits. Hamiltonian Paths and Circuits. Transport Networks. Matching Problems. Coloring Graphs.

Grading Policy:
Homework every week: 40%
Tests: three tests: 30% (Each 10%)
Final: Comprehensive: 30%