

CSCI 190 OUTLINE
DISCRETE MATHEMATICS APPLIED TO COMPUTER SCIENCE
 TEXT: Discrete mathematics and its Applications 5th Edition Rosen

Approved:

Effective: FALL 2007

MATERIAL TO BE COVERED	SECTIONS FROM TEXT	TIME LINE
Truth tables, tautologies, the fundamental theorem of propositional calculus. Predicates and quantifiers. Satisfiability, models. Sets and set operations, characteristic functions, cardinality, countable sets. Functions, bijections. Growth of functions.	1.1 - 1.8	10 Hours
Algorithms, complexity of algorithms. Integers, factorization. The euclidian algorithm. Applications of number theory to encryption. Matrix arithmetic, coordinates, similarity.**	2.1 - 2.7	6.67 Hours
Mathematical reasoning. Rules of inference. Methods of proofs. Sequences and summation. Mathematical induction. Recursive definitions. Recursive algorithms. Program correctness.	3.1 - 3.6	6.67 Hours
Basics of counting, sum rule, product rule, tree diagrams. Permutations, combinations, the Pigeonhole Principle. Binomial coefficients and the Binomial theorem. Pascal's triangle. Discrete probability. Expected value and variance.	4.1 - 4.6 & 5.1 - 5.3	10 Hours
Advanced counting techniques. Recurrence relations, solving recurrence relations. Divide and conquer relations. Inclusion-Exclusion and applications. Relations, n-ary relations, equivalence relations, partial orderings.	6.1 - 6.6 & 7.1 - 7.6	6.67 Hours
Graphs: introduction and terminology. Connected graphs, eulerian path, hamiltonian cycles, shortest path problems, planar graphs, graph coloring. Trees and their applications, tree traversals, spanning trees, minimum spanning trees.	8.1 - 8.8 & 9.1 - 9.5	5 Hours
Boolean algebra, boolean functions and logical gates. Languages and grammars. Finite state machines. Turning machines.	10.1 - 10.4 & 11.1 - 11.5	8.33 Hours

*** 1 Hours = 1 hour of face time. ****This outline allows for 4 hours review and exams.

16 Week Term: 1 week = 2.8333 hours (face time) 6 Week Term: 1 week = 7.5 hours (face time)

It is suggested that one to three exams plus a comprehensive final be given during the semester.

Submitted by: Pop