

CSCI 190 OUTLINE

DISCRETE MATHEMATICS APPLIED TO COMPUTER SCIENCE

TEXT: Discrete Mathematics and Its Applications 6th Edition Rosen (2007)

Approved: OCTOBER 8, 2010

Effective: WINTER 2011

MATERIAL TO BE COVERED	SECTIONS FROM TEXT	TIME LINE
Truth tables, tautologies, the fundamental theorem of propositional calculus. Predicates and quantifiers. Satisfiability, models. Rules of inference. Methods of proofs.	1.1 - 1.7	9 Hours
Sets and set operations, characteristic functions, cardinality, countable sets. Functions, bijections. Sequences and summation.	2.1 - 2.4	3.67 Hours
Algorithms, growth of function, complexity of algorithms. Integers, factorization. The Euclidian algorithm. Applications of number theory to encryption. Matrices and matrix arithmetic, coordinates, similarity.*	3.1 - 3.8	6.33 Hours
Mathematical induction. Recursive definitions. Recursive algorithms. Program correctness.	4.1 - 4.5	4 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. Bayes' Theorem.**	5.1 - 5.6 & 6.1 - 6.2, 6.4, 6.3**	9 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.	7.1 - 7.6 & 8.1 - 8.6	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.	9.1 - 9.8 & 10.1 - 10.5	5 Hours
Boolean algebra, boolean functions and logical gates. Languages and grammars. Finite state machines. Turing machines.	11.1 - 11.4 & 12.1 - 12.5	8.33 Hours

* Supplemental handout

** Optional

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

16 Week Term: 1 week = 3.75 hours (face time) 6 Week Term: 1 week = 10 hours (face time)

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

Submitted by: Pop