

MATH & CS 11
INTRODUCTION TO DISCRETE MATHEMATICS

Text: *Discrete Mathematics and its Applications, Sixth Edition*, by K. H. Rosen.
 An introduction to the basic concepts and structures of discrete mathematics with applications to computer science.

TOPICS	SUGGESTED NO. OF 50 MIN. CLASSES
Logic and proof (Sections 1.1 – 1.7) Propositions, truth tables, propositional equivalence, predicates, quantifiers, negation of a quantified expression. Strategies for proofs (direct, by cases, by contradiction).	7
Sets and functions (Sections 2.1 - 2.4)..... Sets, operations on sets, functions, sequences and summation, finite and infinite sets, Cantor’s theorem.	3
Arithmetic and its algorithms (Sections 3.1 – 3.6)..... Integers and their representations, algorithms for addition and multiplication, the Euclidean algorithm, primes, the Fundamental Theorem of Arithmetic. The Halting Problem.	5
Induction and recursion (Sections 4.1 – 4.4)..... Mathematical induction. Recursive definitions and recursive algorithms. .	4
Basic enumeration (Sections 5.1 - 5.6)..... The Rule of Sum and Rule of Product, the Pigeonhole Principle, permutations and combinations.	4
Discrete probability (Sections 6.1 – 6.4)..... Probability, random variables, conditional probability, expected value and variance.	3