MATH 111 & CS 111
DISCRETE STRUCTURES

Text: *Discrete Mathematics and its Applications, Fifth Edition,* by K. H. Rosen.
A continuation of Math & CS 11, presenting more advanced concepts of discrete mathematics with applications to computer science.

TOPICS **SUGGESTED NO. OF 50 MIN. CLASSES**

Advanced Enumeration……..…….…….……..6
(Sections 2.2, 6.1-6.6)

Growth of functions, recurrence relations, solving linear relations with constant coefficients, generating functions, inclusion-exclusion.

Graphs……....7
(Sections 8.1-8.8)

Undirected and directed graphs, connectivity, planarity (theorems of Kuratowski & Euler), Euler paths and Hamiltonian paths.

Trees…….6
(Sections 9.1-9.6)

Rooted trees, n-ary trees, spanning subtrees, height, enumerations of trees (Cayley's theorem and Catalan numbers), tree traversal, optimal spanning trees.

Number Theory……..……..……3
(Sections 2.4(from Modular Arithmetic) & 2.6)

Modular arithmetic, Chinese remainder theorem, Fermat's "little" theorem, RSA encryption.

Algebraic Structures……..4
(Supplementary material)

Monoids, groups, rings and fields. Homomorphisms and isomorphisms.