Discrete Mathematics / 20MAT115 Credits - 4

Course Syllabus

Unit-1

Logic, Mathematical Reasoning and Counting: Logic, Prepositional Equivalence, Predicate and Quantifiers, Theorem Proving, Functions, Mathematical Induction. Recursive Definitions, Recursive Algorithms, Basics of Counting, Pigeonhole Principle, Permutation and Combinations.

Unit-2

Relations and Their Properties: Representing Relations, Closure of Relations, Partial Ordering, Equivalence Relations and partitions.

Unit-3

Advanced Counting Techniques and Relations: Recurrence Relations, Solving Recurrence Relations, Generating Functions, Solutions of Homogeneous Recurrence Relations, Divide and Conquer Relations, Inclusion-Exclusion.

Unit-4

Graphs: Special types of graphs, connectivity, Euler and Hamiltonian Paths.
Trees: Applications of trees, Tree traversal, Spanning trees.

Textbook

1. Kenneth H. Rosen, Discrete Mathematics and its Applications, Tata McGraw- Hill Publishing Company Limited, New Delhi, Sixth Edition, 2007.

Reference(s)

1. James Strayer, Elementary Number Theory, Waveland Press, 2002.
2. R.P. Grimaldi, Discrete and Combinatorial Mathematics, Pearson Education, Fifth Edition, 2007.
3. 3. Thomas Koshy, Discrete Mathematics with Applications, Academic Press, 2005.Liu, Elements of Discrete Mathematics, Tata McGraw- Hill Publishing Company Limited, 2004.