CSDC1-301: Discrete Structures

Introduction to Sets, Finite and Infinite Sets, Unaccountably Infinite Sets. Introduction to Functions and relations, Properties of Binary relations, Closure, Partial Ordering Relations. 6 L

[1] **:** [1.1 to 1.4, 3.1, 3.3, 3.4, 3.7(excluding lattices)],
[2] : [2.3]

Pigeonhole Principle, Permutation and Combinations, Mathematical Induction, Principle of Inclusion and Exclusion. 4 L

[1] : [1.5, 1.6, 2.1 to 2.4]
[2] : [5.2(Introduction only)]

Asymptotic Notations, Summation formulas and properties, Bounding Summations, Approximation by Integrals. 8 L

[2] : [3.1(excluding Greedy & Halting problem),3.2]

[3] : [Appendix A]

Recurrence Relations, Generating Functions, Linear Recurrence Relations with constant coefficients and their solution. 6 L

[1] : [8.1, 8.2,8.4, 9.1 to 9.6]

Substitution Method, Recurrence Trees, Master Theorem. 6 L

[3] : [4.3 to 4.5]

Basic Terminology of Graphs, Models and Types, Multigraphs, Weighted Graphs, Graph Representation. Graph Isomorphism Graph Connectivity, Euler and Hamiltonian Paths and Circuits 6 L

[2] : [8.1 to 8.5]

Planar Graphs, Graph Coloring, Basic Terminology of Trees, Properties of Trees, Spanning Trees. 6 L

[2] : [8.7 to 8.8, 9.1, 9.4]

Logical Connectives, Well Formed Formulas, Tautologies, Equivalence, Inference Theory. 6 L

[1] : [1.8 to 1.14]

Recommended Reading Material

Text Books

1. C. L. Liu and D.P. Mohapatra, *Elements of Discrete Mathematics*, Third Edition, Tata McGraw Hill , 2008.
2. K. Rosen, *Discrete Mathematics and Its Applications*, Sixth Edition, Tata McGraw Hill, 2007.
3. T.H. Cormen, C.E. Leiserson, R.L. Rivest, *Introduction to Algorithms*, Third Edition, Prentice Hall of India,2010.

Reference Books

4. J.P. Trembley, R. Manohar, *Discrete Mathematical Structures with Application to Computer Science,* First Edition, Tata McGraw Hill, 2001.

Online Reading/Supporting Material

5. http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-042j-mathematics-for-computer-science-fall-2005/