

CA500 MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

Prerequisite: Nil

Credits: 3

Aim: To provide basic mathematical foundation required for various computer science courses.

Course Content:

Discrete Maths: Theory of Sets; Mathematical Induction; Relations and Functions; Recurrence Relation; Calculus: Functions; Limits and Continuity; Differentiation and Integration; Differential Equations.

Logic: Logic operators such as AND, OR etc., Truth tables; Theory of inference and Deductions; Mathematical Introduction; Predicate calculus Predicates and Quantifiers

Linear equation & Matrices: Row/Column operations; Gaussian Elimination; Decomposition; Inverse; Determinants; Properties of determinants; Cramer's Rule; Decomposition; Inverse. Vector spaces Linear Independence, Bases, subspace and dimensionality, Length, angle, direction cosines; orthogonalizations.

Theory of Graphs: Graphs, subgraphs, isomorphism; Classes of graphs; paths and cycles; Trees; Connectivity; Planar Graphs; Hamiltonian and Eulerian Graphs.

Books:

1. Korthage, R.R.: Discrete Computational Structures, Academic Press, 1974.
2. Preparata, F.P.: Introduction to Discrete structures, Addison-Wesley, 1973.
3. Trembley, J.P. and Manohar R.P.: Introduction to Discrete Mathematical structures with applications to Computer Science, McGraw Hill, 1975.
4. Lew: Computer Science: Mathematical Introduction, Prentice Hall International.