

MEDI-CAPS UNIVERSITY, INDORE
M.Tech Computer Science I-SEM

MATHEMATICS FOR COMPUTER SCIENCE

UNIT – I

Linear Algebra: Vector spaces, subspaces, Sum and direct sum of subspaces, Linear span, Linear dependence, independence and their basic properties, Basis, Linear transformations and their representation as matrices, the algebra of linear Transformations, The rank- nullity theorem. Change of Basis, Orthogonality, Eigen value analysis.

UNIT-II

Logic: Propositional logic, Truth tables, Tautologies, Resolution proof system, Predicate logic, Temporal logic

Fuzzy: Fuzzy : Introduction to Fuzzy Sets – Basic Definition and Terminology – Set-theoretic operations – Member Function Formulation and parameterization – Fuzzy Rules and Fuzzy Reasoning - Extension principle and Fuzzy Relations – Fuzzy If-Then Rules – Fuzzy Reasoning and Introduction defuzzification technique.

UNIT-III

Random Variables and Stochastic Processes: Random variables, Stochastic processes, Markov process, Markov chain, transition probability transition probability matrix, transient and steady state, Queuing system traffic intensity, distribution queuing system, concepts of queuing models (M/M/1: Infinity/ Infinity/ FC FS), (M/M/1: N/ Infinity/ FC FS), (M/M/S: Infinity/ Infinity/ FC FS).

UNIT-IV

Graph: Basic definitions of Graphs, connectivity of a graph, cut points, cycles Hamiltonian graphs, sub graphs, spanning sub graphs, isomorphic graphs, matrix representation of graphs, Bipartite graphs, Tree, different characterization of trees Algorithms on graphs, BFS, DFS Dijkstra's algorithm for shortest path, Floyd's algorithm for all pairs of shortest paths, Kruskal's and Prim's algorithm for minimum spanning tree.

UNIT-V

Number Theory: Introduction to Number theory: Divisibility, modular arithmetic (addition modulo and multiplication modulo); Statements and applications of Euler and Fermat Theorems, Primitive Roots, Discrete Logarithms, Primality Test, Finding Large primes.

TEXT BOOKS

1. Graph Theory with application to Engineering and Computer Science Narishng Deo , PHI .
2. Linear Algebra and Probability for Computer Science Applications (1st Ed): Ernest Davis, CRC Press
3. Graph Theory : K Patrai , 3rd edition S.K. Kataria and Sons .
4. Cryptanalysis of number theoretic Cyphers, Samuel S. Wagstaff Jr. Champan & Hall/CRC press 2003.

5. Fuzzy Sets And Fuzzy Logic: Theory And Applications, George J. Klir, Pearson Education

REFERENCES

1. Fuzzy Mathematics, An Introduction for Engineers and Scientist, Mordeson, John N., Premchand S. Nair, Physica-Verlag Heidelberg, Springer-Verlag Berlin Heidelberg
2. Linear Algebra, A.k. Sharma, Discovery Publishing House, 2007.
3. Mathematical Foundation of computer networking , Shrinivasan Keshav , Pearson Education, 2013