RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

New Scheme Based On AICTE Flexible Curricula

CSE-Artificial Intelligence and Machine Learning/ Artificial Intelligence and Machine Learning IV-Semester

AL401 Introduction to Discrete Structure &Linear Algebra

Unit 1: Set Theory, Relation, Function, Theorem Proving Techniques:Set theory: definition of sets, Venn Diagram, proofs of some general identities on set,Relation: Definition, Types of relation ,Composition of relation ,Equivalence relation, Partial ordering relation,POSET,Hasse diagram and Lattice .

Unit 2: Algebraic structure: Definition, Properties, types: Semi Group, Monoid, Groups, Abelian Group, Properties of group, cyclic group, Normal subgroup, Ring and Fields: definition and standard result, Introduction to Recurrence Relation and Generating Functions.

Unit 3: Propositional logic: Proposition, First order Logic, Basic logical operation, Truth tables, Tautologies and Contradiction, algebra of proposition, logical implication, logical equivalence ,predicates, Normal Forms, Quantifiers
Graph theory: Introduction and basic terminology of graph, types of graph, Path, Cycles, Shortest path in weighted graph, graph colorings.

Unit 4: Matrices: Determinant and Trace,Cholesky Decomposition, Eigen decomposition,Singular Value decomposition(SVD),Gradient of a matrix:Useful identities For computing Gradient.

Unit 5: Test of Hypothesis : Concept and Formulation ,Type-I and Type-II Errors,Time Series Analysis ,Analysis of Variance (ANOVA).

References:
 1. C.L.Liu, "Elements of Discrete Mathematics" Tata Mc Graw-Hill Edition.
 2. Trembley, J.P & Manohar; "Discrete Mathematical Structure with Application CS", McGraw Hill.
3. Kenneth H. Rosen, "Discrete Mathematics and its applications", McGraw Hill.
 4. Bisht, "Discrete Mathematics",Oxford University Press
 5. Biswal,"Discrete Mathematics & Graph Theory", PHI
6. Mathematics For Machine Learning-Marc Peter Deisenroth,A. Aldo Faisal,Cheng soon ong
7.Statistical Method- S.P. Gupta