

CSE333:COMBINATORIAL STUDIES-I

L:2 T:0 P:2 Credits:3

Course Outcomes: Through this course students should be able to

CO1 :: Understand and explain the concepts of sets, functions, partial order, first-order logic, and propositional logic, and apply them to problem-solving scenarios.

CO2 :: explain graphs, connectivity, matching, and coloring concepts, and illustrate their applications in solving graph-related problems and combinatorial challenges.

CO3 :: apply linear algebra concepts like matrices, determinants, and eigenvalues to solve systems of linear equations and LU decomposition problems.

CO4 :: analyze and solve calculus problems involving limits, continuity, differentiability, and applications like finding maxima, minima, and applying the mean value theorem.

CO5 :: evaluate and apply probability concepts, including random variables, probability distributions, and statistical measures to solve related problems.

CO6 :: create and interpret computations and estimations using numerical skills, and analyze data effectively.

Unit I

Discrete Mathematics : propositional logic, first order logic, sets, relations, functions, partial orders, lattices, groups

Unit II

Graphs : connectivity, matching, coloring

Combinatorics : counting, recurrence relations, generating functions

Unit III

Linear Algebra : matrices, determinants, system of linear equations, eigenvalues, eigenvectors, LU decomposition

Unit IV

Calculus : limits, continuity, differentiability, maxima and minima, mean value theorem, integration

Unit V

Probability : random variables, uniform, normal, exponential, poisson and binomial distributions, mean, median, mode, standard deviation, conditional probability, Bayes theorem

Unit VI

Numerical Ability : numerical computation, numerical estimation, numerical reasoning, data interpretation

List of Practicals / Experiments:

Practicals

- Problem solving on Discrete Mathematics
- Problem solving on Graphs
- Problem solving on Combinatorics
- Problem solving on Linear Algebra
- Problem solving on Calculus
- Problem solving on Probability
- Problem solving on Numerical Ability

Text Books:

1. WILEY ACING THE GATE: ENGINEERING MATHEMATICS AND GENERAL APTITUDE by ANIL K. MAINI, VARSHA AGRAWAL, NAKUL MAINI, WILEY

References:

1. DISCRETE MATHEMATICS AND ITS APPLICATIONS WITH COMBINATORICS AND GRAPH THEORY by KENNETH H. ROSEN, Mc Graw Hill Education

