

RANDOMISED & APPROXIMATE ALGORITHMS

Course Code: 16CS331

Module 1

Elements of probability theory, Verification of polynomial identities, matrix multiplication. Las Vegas and Monte Carlo algorithms, Random Variables and Expectations.

Module 2

Jensen's Inequality, Bernoulli and Binomial RV, Conditional Expectation, Geometric distribution, Coupon collector's problem.

Module 3

Game Tree evaluation, The Minimax Principle, Randomness and Non Uniformity, Markov's Inequality, Variance and Moments of a RV, Chebyshev's inequality.

Module 4

Randomised Quick Sort, Coupon Collector's problem and Randomised Median Finding.

Module 5

Sum of Poisson Trials, Coin flips, Set balancing, Packet Routing in Sparse Networks, Bucket Sort, Hashing, Hamiltonian Cycles in Random Graphs, Finding a large cut, Maximum satisfiability, Graphs with large girth.