

Syllabus for PhD Admission Test for IT Department

Research Methodology:

Ethics in research - legal issues, copyright, plagiarism. Purpose of writing report, Types of Report, Structure and Components of a research report, referencing report writing, how (and how not) to write a good conference/journal paper.

Elementary graphs: graph, tree, planner graph.

Combinatorics: Basic counting rules: sum rule, subtraction principle, product rule, division principle, permutations, combination.

Statistics: Mean, median, mode, standard deviation, correlation, regression, hypothesis testing.

Set Theory: countable and uncountable sets, relation, function, group, field.

Review of Probability Theory: Discrete Random Variable:- The p.m.f., distribution functions, analysis of program MAX, probability generating functions, independent random variables;

Continuous Random Variable:- The p.d.f., exponential distribution, Binomial and Poisson distributions.

Subjects:

Data Structure: Array, Stack, Queue, Linked List, Tree, Binary Tree, Search Tree, Balanced Search Trees: AVL, Red Black tree, Graph Traversals, MST, Shortest path, Hashing, Sorting.

Algorithms: Greedy, Dynamic Programming, Heuristic Search, Complexity Analysis, NP Completeness, Approximation Algorithms.

Operating System: Process Management, Memory Management, CPU Scheduling, Process Synchronization, File Systems.

Networks: OSI reference model, TCP/IP reference model, Data Link Layer, Network Layer, Transport Layer, Local Area Networks.

Theoretical Computer Science: DFA, NFA, PDA, CSG, TM.

DBMS: ER Diagram, Relational Data Model, Normalization, Concurrency Management, Transaction Management, Recovery Management.