



K L UNIVERSITY

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Syllabus for Entrance Test for PhD Admissions Department of Computer Applications

Microprocessors and Computer Organisation

Microprocessor and Computer Organization: Architecture, programming, memory and I/O interfacing, Machine instructions and addressing modes, ALU and data path, CPU control design, Memory interface, I/O interface, Instruction pipelining, Cache and main memory, Secondary storage, Microcontrollers.

Programming and Data Structures

Programming and Data Structures: Programming in C/C++/JAVA, Stacks, Queues, Linked Lists, Trees, Binary search trees, Binary heaps, Hashing, Sorting, Searching.

Algorithms: Analysis, Design: Greedy approach, Dynamic programming, Divide and conquer; Tree and graph traversals, Connected components, Spanning trees, Shortest paths; Asymptotic analysis (best, worst, average cases) of time and space, upper and lower bounds, Basic concepts of complexity classes P, NP, NPhard, NPcomplete.

Operating Systems

Operating System: Processes, Threads, Inter-process communication, Concurrency, Synchronization, Deadlock, CPU scheduling, Memory management and virtual memory, File systems, I/O systems, Protection and security.

Data bases

Databases: ERmodel, Relational model (relational algebra, tuple calculus), Database design (integrity constraints, normal forms), Query languages (SQL), File structures (sequential files, indexing, B and B+ trees), Transactions and concurrency control.

Computer Networks

Computer Networks: ISO/OSI model, LAN technologies (Ethernet, Token ring, etc), Flow and error control techniques, Routing algorithms, Congestion control, TCP/UDP and sockets, IP(v4), Application layer protocols (dns, smtp, pop, ftp, http); Basic concepts of hubs, switches