



COMPETE INDIA ZONE

AN ENGINEERING ENTERPRISE BY IITians

Computer Science Engineering (CSE) – GATE Syllabus

S.NO.	SUBJECT NAME	SYLLABUS
1	Engineering Mathematics	<p>Linear Algebra: Matrices, determinants, system of linear equations, Eigen values and eigenvectors, LU decomposition.</p> <p>Calculus: Limits, continuity and differentiability. Maxima and minima. Mean value theorem, Integration.</p> <p>Discrete Mathematics: Propositional and first order logic. Sets, relations, functions, partial orders and lattices. Groups, Graphs: connectivity, matching, coloring. Combinatorics: counting, recurrence relations, generating functions.</p> <p>Probability and Statistics: Random variables. Uniform, normal, exponential, poisson and binomial distributions. Mean, median, mode and standard deviation. Conditional probability and Bayes theorem.</p>
2	Digital Logic	Boolean algebra, Combinational and sequential circuits, Minimization, Number representations and computer arithmetic (fixed and floating point).
3	Computer Organization and architecture	Machine instructions and addressing modes. ALU, data-path and control unit. Instruction pipelining. Memory hierarchy: cache, main memory and secondary storage; I/O interface (interrupt and DMA mode).
4	Programming and data Structures	Programming in C, Recursion. Arrays, stacks, queues, linked lists, trees, binary search trees, binary heaps, graphs.
5	Algorithms	Searching, sorting, hashing. Asymptotic worst case time and space complexity. Algorithm design techniques: greedy, dynamic programming and divide-and-conquer. Graph search, minimum spanning trees, and shortest paths.

6	Theory of Computation	Regular expressions and finite automata, Context-free grammars and push-down automata. Regular and context-free languages, pumping lemma. Turing machines and undecidability.
7.	Compiler Design	Lexical analysis, parsing, syntax-directed translation, Runtime environments, Intermediate code generation
8.	Operating System	Processes, threads, inter- process communication, concurrency and synchronization. Deadlock, CPU scheduling, memory management and virtual memory, file system
9	Databases	ER-model, Relational model: relational algebra, tuple calculus, SQL, Integrity constraints, normal forms. File organization, indexing (e.g., B and B+ trees). Transactions and concurrency control.
10	Computer Networks	Concept of layering, LAN technologies (Ethernet), Flow and error control techniques, switching. IPv4/IPv6, routers and routing algorithms (distance vector, link state). TCP/UDP and sockets, congestion control. Application layer protocols (DNS, SMTP, POP, FTP, HTTP). Basics of Wi-Fi. Network security: authentication, basics of public key and private key cryptography, digital signatures and certificates, firewalls.

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