COMPUTER SCIENCE ENGINEERING – SYLLABUS.

i. **Digital Logic:**
   Boolean algebra, Combinational and sequential circuits, Minimization, Number representations and computer arithmetic (fixed and floating point).

ii. **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).

iii. **Programming and Data Structure:**
   Programming in C. Recursion. Arrays, stacks, queues, linked lists, trees, binary search trees, binary heaps, graphs.

iv. **Algorithms:**
   Searching, sorting, hashing. Asymptotic worst case time and complexity. Algorithm design techniques: greedy, dynamic programming and divide-and-conquer. Graph Search, minimum spanning trees, shortest path.

v. **Theory of Computation:**
   Regular expressions and finite automata. Context-free grammars and push-down automata. Regular and contex-free languages, pumping lemma. Turing machines and undesirability.

vi. **Operating Systems:**
   Processes, threads, inter-process communication, concurrence and synchronization. Dead lock, CPU, Scheduling, Memory Management and virtual memory, Fire Systems

vii. **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.

viii. **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.

ix. **Object Oriented Programming:**
   OOP concepts basic characteristics of JAVA, principles of packages. Inheritance and interfaces, explorations and use of I/O streams.

x. **Enterprise Resource Planning (ERP):**
   Basic of ERP, implementation issue of ERP, Business modules of ERP, popular product in the area of ERP, current and future trends in ERP.

xi. **Artificial Intelligence:**
   Characteristics of intelligent agents, Strategies' in AI, Knowledge in solving AI problems, application of AI.

xii. **Management Information System:**
   Basic of MIS, System Analysis and Design, Information system, Security and control

xiii. **Business Analytics:**
   Business intelligence, knowledge delivery efficiency.

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