

Syllabus for Computer Science & Engineering
Artificial Intelligence and Machine Learning (AI&ML)

AI&ML (100 Marks)

Unit-I: Digital Electronics

Number systems - Conversions-Codes – Logic gates AND, OR, NOT, NOR, NAND and XOR – Boolean Expressions - De-Morgan's theorems – K-Map - Combinational Circuits – Adders- Encoders & Decoders - Multiplexers and De-multiplexers- Latches - Flip-flops – Edge and Level triggering - Counters - Registers – Semiconductor memories.

Unit-II: Microprocessors

8086 Microprocessor – Architecture, Segmentation concepts – Instruction set of 8086 – Instruction formats – Addressing modes of 8086 – Interrupts Assembly Language Programming – Peripheral devices & interfacing –INTEL 8255, 8257, 8251A, and 8279.

Unit-III: Computer Organization

Functional blocks of Digital Computer – Stored program concept – Fixed point, Floating point number representations – Instruction formats - Addressing modes– Memory hierarchy – Virtual memory, Associative memory – Cache memory – I/O Organization – Modes of data transfer – Programmed I/O, DMA, Interrupt initiated I/O – Pipeline and Vector processing – Flynn's classification.

Unit-IV: C Programming and Data Structures

Algorithms – Flowcharts - C Tokens - Data types - Operators and expressions – Precedence and Associativity of operators – Type conversions - Control statements – Arrays – Memory allocations – Strings – Functions, parameter passing – Pointers - Structures, Unions - Storage classes– Preprocessor directive statements – Files

Data Structures– Abstract Data Types - Time and Space complexities – Stacks and Queues - Linked Lists – Binary trees – Tree traversal techniques - Sorting: Bubble, Selection, Insertion, Quick and Merge sorts - Searching: Sequential and Binary search techniques.

Unit-V: Computer Hardware & Networking

BIOS – Components of Motherboard – Processors –Hard Disk Drives – Input & Output devices –

Networking – Classification of networks - OSI reference model, TCP/IP reference model – Network topologies: Bus, Ring, Star, Mesh, Hybrid – LAN components: Coaxial, Twisted pair, Optical fiber cables and Connectors – LAN devices: Repeaters, Hubs, Bridges, Switches, NIC, Routers, Modems - TCP/IP addressing scheme – IP address classes – IP Sub-netting – Linux commands.

Unit-VI: Operating Systems:

Operating System concepts, Services, Types, System calls – Process Management – CPU scheduling algorithms: FCFS, SJF, Round Robin, Priority, Multilevel scheduling – Threads – Semaphores - Inter Process Communication – Deadlocks - Memory Management – Overlays, Paging, Segmentation, Virtual memory, Page replacement algorithms: FIFO, LRU, Optimal – Thrashing - Disk scheduling - Disk scheduling algorithms: FIFO, SSJF, SCAN, C-SCAN - File management – file operations, access methods, directory structure.

Unit-VII: RDBMS

Concepts of Database systems, Data abstraction - Data independence, Data models, E-R model – Structure of Relational database – DDL, DML and DCL commands – Keys - Normal Forms: 1st, 2nd, 3rd and BCNF - SQL – data types, operators – joins - views, sequences, synonyms and indexes – PL/SQL – data types, control structures, cursor management, triggers, exceptions, functions, procedures, recursion and packages.

Unit-VIII: Object Oriented Programming Through C++

Concept of OOPs – classes and objects – Constructors and destructors –Function overloading and Operator overloading – Inheritance types -Virtual functions – friend functions –inline functions - this pointer – I/O manipulators – File and I/O functions – Templates.

Unit-IX: Java Programming

Java – data types, variables, operators, arrays – Classes and Objects – Methods – Constructors – Method overloading, Method overriding –Static final members - Inheritance – super, final keywords – Interfaces – Packages - Exception handling - Multithreading – Applets – AWT – Event handling -JDBC – Servlets.

Unit-X: Internet Programming

Internet fundamentals – HTML, Tags, Attributes, Formatting text – Cascading Style Sheets - Web servers - Java script – data types, Operators – control structures – procedures, functions and arrays – PHP – data types, variables, operators, control structures, arrays, functions, concept of accessing databases – sessions and cookies.
