UNIT-I

Introduction, OS Structure, services and components, multitasking, multiprogramming, time sharing, multithreading, Process Management, CPU scheduling, Deadlocks. Inter-process Communication, Concurrent Processing and concurrency control, Memory management, Virtual memory, Demand Paging and Page Replacement Algorithms. I/O and Device management, buffering and spooling file management, file storage, Access methods and free space management. Operating System Security: Introduction, External & Operational security. Threat monitoring auditing, Access control, H/W security. Distributed & Multiprocessor system: Introduction to Distributed Operating system, Multiprocessor operating system organization, Recovery and Fault Tolerance Case study of UNIX / LINUX: Introduction, kernel & shell, file system, shell programming.

UNIT-II

Introduction, Organization & Architecture, Computer Evolution and Performance. Basic Computer Organization: Computer System Buses, registers & stacks, ALU, CPU, Control Unit, Hardwired and Micro programmed Control. CPU Instruction sets: Characteristics, Functions, Addressing modes and Formats, CPU Structure, Processor & Register Organization, RISC and Superscalar Processors. Computer Arithmetic: Addition, subtraction, multiplication and division algorithms for Integer & Floating Point Numbers. Memory Technology: Internal & External memory, Main memory, Auxiliary Memory, Associative memory, Cache Memory, Virtual & High-Speed memories, RAID.I/O Devices & Modules: Peripheral devices, I/O Bus and interface modules, I/O vs. memory Bus, Asynchronous Data Transfer, Mode of Transfer, Programmed & Interrupt driven I/O, Priority Interrupt, DMA. Multiprocessors: Characteristics, Interconnection Structures, Inter processor arbitration, Inter processor communication and synchronization, cache coherence. Pipelining, Arithmetic pipeline, Instruction Pipeline, RISC Pipeline

UNIT-III

Data communication Techniques, Synchronous-Asynchronous Transmission, Digital Transmission, Transmission Media, Impairments, Data encoding Techniques. Communication Networks: Circuit switching, Message switching, Packet Switching. X.25, LAN Technologies, Virtual Circuits. Network Reference models – OSI and TCP/IP, Layered architecture, Data Link Layer: Design issue, framing, error control, flow control, HDLC, SDLC, data link layer in the Internet (SLIP, PPP), Network Layer: Routing Algorithms, shortest path, distance vector routing, Link state routing, and multicast routing. Congestion control, traffic shaping, leaky bucket, token bucket, choke packets, load shedding, internetworking- connection oriented and connectionless, fragmentation, internet architecture and addressing, IP protocol, ICMP, APR, RARP, OSPF, BGP, CIDR, IPv6,Transport Layer: Transport Service, quality of service, connection management, addressing, flow control and buffering, multiplexing, Internet transport protocols- TCP and UDP, Session layer: Dialogue management,

synchronization and remote procedure call, Presentation layer: date representation, data compression, network security and cryptography Application layer: DNS, SNMP, Telnet, TFTP, NFS E- mail, SMTP and World Wide Web

UNIT-IV

Introductory concepts, Digital systems & switching networks, Number Systems, Negative number representation, Conversions, Codes and their Applications.Digital Arithmetic, Huntington Postulates, Boolean algebra, Basic laws & theorems, Inversion, duality.Applications of Boolean algebra.Arithmetic operations, Binary and BCD addition, subtraction. Logic Gates, Universal building blocks, Minimization Techniques: Algebraic, K-Map, QM, VEM and applications Combinational network design, Multi-level gate networks, Adders, Subtractors, Encoders & Decoders, Multiplexers and Demultiplexers, code converters, Hazards in combinational networks, PLDs, PGAs, PLAs .Sequential network design, Flip Flops, Truth Tables, Excitation Tables, Characteristic equations, state and Timing diagrams and applications, Registers, universal register. Design of Counters, Asynchronous & Synchronous counters, Special Counters, Computer aids. Iterative networks, Parity checker, Pattern detector & comparator. IC, Performance Parameters, Logic families, basic gate circuits, interfacing and applications, Data sheets A/D converters and Semiconductor memories High Frequency digital systems, properties, transmission lines, crosstalk, Microprocessors: Introduction, basic Principles, evolution, Salient features, comparison and applications.

UNIT-V

Overview of Programming in C/C++: Elementary Programming Concepts, Data types, Control Structures, Functions, Array, Pointers, Structures, Classes: declaration, constructors, destructors, operator overloading, Inheritance, Polymorphism. Data Representation, Arrays & Matrices, Special Matrices, Sparse Matrices, Searching & Sorting Techniques Stacks, Queues & Lists, Sequential & Linked Representation, Applications Skip Lists & Hashing, Priority Queues, Recursion Trees: Binary Tree, Properties & Representation, Binary Tree Traversal, ADT Binary Tree, Extensions, Applications, Tournament Trees, Binary search Trees, AVL Trees, Spanning Trees, Heaps, Heap sort Graphs: Representations & Properties, Directed and Undirected graphs, Graph search methods, Path finding Algorithms, Dijkstra's algorithm, Applications Searching, Introduction, Sequential search, Binary Search, Comparison trees Sorting, Introduction, Insertion Sort, Selection Sort, Shell Sort, Merge sort, Quick Sort, Heap sort, Radix Sort. Tables and Information Retrieval.