Data Structure & Algorithms: Recurrence relations, Big-Oh and little-Oh notation, Searching & sorting algorithms; Stack, Queue, Dequeue, singly, doubly and circularly linked list, Tree traversals, AVL Trees, Graph shortest path algorithms, Minimum spanning tree algorithms, BFS and DFS & NP-Complete Problems.

System Software: Introduction to system software: compiler, assembler, linker, loader & operating systems; functions of an Editor; Multitasking, Multiprogramming, Timesharing concepts in operating systems.

Parallel Processing: Overview of Parallel Processing and Pipelining Processing, study and comparison of uni-processors and parallel processors; Flynn's classification; Classification of pipelining processors, Pipeline Architecture, Study and comparison of processors with and without pipelining. General pipelining reservation table, Pipelining hazards and resolving techniques, Data buffering techniques, Job sequencing and Collision; VLIW (Very Long Instruction Word) processor. Vector and Array Processor, Basic vector architecture, Issues in Vector Processing

VLSI Design: Moore's Law, Gadjski Y-Chart, Simple Design Flow and representation of circuits; Data flow and sequencing graph. Basic language concepts in Hardware Description Languages: signals, entity-architecture, concurrent statements, understanding delays and VHDL Programming.

Cloud Computing: Introduction to Cloud Computing, Definition, Characteristics, Components,
Cloud provider, SAAS, PAAS, IAAS and Others, Organizational scenarios of clouds, Administering & Monitoring cloud services, benefits and limitations, Deploy application over cloud, Comparison among SAAS, PAAS, IAAS with examples. Virtual machine technology, virtualization applications in enterprises, Pitfalls of virtualization; Virtualization security management virtual threats, VM Security Recommendations, VM-Specific Security techniques, Secure Execution Environments and Communications in cloud.

Network & Security: Introduction to OSI Network Layers; IP address, http, ftp & smtp protocols; Circuit switching, packet switching & multicasting operations. Basics of cryptography: cryptographic hash functions, symmetric and public-key encryption; Internet worms, viruses and spyware. TCP/IP and DNS security.

Real Time Systems: Characteristics of Real-Time Systems, Issues in Real-Time Systems, Periodic & Aperiodic Task scheduling in Uniprocessor & Multi-Processor systems; Static & Dynamic scheduling, priority driven, round robin and clock driven scheduling. Resource reclaiming algorithms in Multi-processor Systems.

Theory of Computations: Sets and relations; proofs and principles of Mathematical Induction; Recursive definitions, Regular Languages and Regular expressions and Finite Automata.

Programming Languages: Data types, control statements, functions, pointers and file handling concepts in C, C++ & Java. Concept and use of Inheritance & Polymorphism; Threading & Exception Handling in Java; String Processing.