Computer Organization and Architecture: Machine instructions and addressing modes, ALU and data-path, CPU control design, Memory interface, I/O interface (Interrupt and DMA mode), Instruction pipelining. Cache and main memory, Secondary storage.

Computer Networks: ISO/OSI stack, LAN technologies, Flow and error control techniques, Routing algorithms, Congestion control, TCP/UDP and sockets, IP(v4), IP(v6), Application layer protocols, (ICMP, DNS, SMTP, POP, FTP, HTTP), Basic concepts of hubs, switches, gateways, and routers. Wireless technologies, Network security – basic concepts of public key and private key cryptography, digital signature, firewalls. Computer Network Architecture, Circuit switching, Packet and Massage Switching, Network Structure, Physical Layer, Data Link Layer, Framing, Retransmission algorithms, Multiple access and Aloha. CSMA/CD and Ethernet, High Speed LANs and topologies, broadcast routing and spanning trees, TCP/IP Stack, IP Networks and Internet, DNS and Firewalls, Intrusion Detection and Prevention. Transport layer and TCP/IP. Network Management and Interoperability.

Web Technologies: HTML5, CSS3, XML basic concept of client-server computing, web server, proxy server, web application development, web services and frontend technologies.

Cyber Security and Emerging Technologies: Secure programming techniques, OWASP top 10 vulnerabilities, Concepts on IOT, Block Chain.

Programming and Data Structures: Programming in modern languages viz. Java, .Net, Open Source (PHP), Python, GoLang, NodeJS, etc. Functions, Recursion, Parameter passing, Scope, Binding, Abstract data types Arrays, Stacks, Queues, Linked Lists, Trees, Binary search trees, Binary heaps, Object Oriented Programming Concepts- Object, Class, Inheritance, Polymorphism, Abstraction and Encapsulation

Operating System: Processes, Threads, Inter-Process communication, Concurrency, Synchronization, Deadlock, CPU scheduling, Memory management and virtual memory, File systems, I/O systems, Protection and security,

Data Base Management Systems: ER Diagram, data models- Relational and Object oriented databases. Data Base Design: Conceptual data base design, Normalization Primitive and Composite data types, concept of physical and logical databases, data abstraction and data independence, data aggregation and Relational Algebra. Application Development using SQL: Host Language interface, embedded SQL programming, Stored procedures, triggers, and views, Constraints assertions. Internal of RDBMS: Physical data organization in sequential, indexed random and hashed files. Inverted and multi list structures, B trees, B+ trees, Query Optimization, Join algorithm. Transaction Processing, concurrency control and recovery management, Transaction model properties and state serialisability, Lock base protocols, two phase locking. Different server multi user, multi-process operating systems and requirement for client interfaces in distributed application environments.

Information Systems and Software Engineering: Information gathering, requirement and feasibility analysis, data flow diagrams, process specifications, input/output design, process life cycle, planning and managing the project, design, coding, testing, implementation, maintenance.

Cloud Technology: Compute, Network, Storage Management Technologies, Edge Computing, etc.

Client Server Technology: Microsoft Windows Server, RHEL, VMware, Internet Information Server, Apache, Tomcat, LDAP/ AD Management, DNS, DHCP Management, SAN, NAS Management.