CS208: Computer Networks	L	T	P	Fundamentals of Computer Science and Design and Analysis of Algorithms
	3	0	2	

Course Objective: The course aims to provide students with a thorough understanding of computer network principles, architectures, protocols, and technologies, enabling them to design, implement, and manage efficient, secure, and scalable computer networks.

S. No	Course Outcomes (CO)
CO1	Understand the foundational aspects of computer networks, including network topologies, OSI and TCP/IP models, to design and analyze network structures effectively.
CO2	Master error detection and correction, data link control, and IP addressing, enabling efficient data communication across networks.
CO3	Learn advanced routing protocols, Quality of Service (QoS) principles, and basic network security to manage high-performance, secure networks.
CO4	Acquire a deep understanding of transport protocols like UDP and TCP, focusing on reliable data transfer and congestion control.
CO5	Develop expertise in application layer protocols and network management, preparing for effective management of networked applications.

S. No	Contents	Contact Hours
UNIT 1	Foundations of Computer Networks: Evolution of computer networks, Basic principles of network design, Network topologies: Star, Mesh, Bus, Ring, Hybrid, OSI and TCP/IP models, and Physical layer fundamentals: Data and signals, bandwidth utilization, transmission techniques and media, signal encoding, multiplexing.	8
UNIT 2	Data Link and Network Layer Protocols: Error detection and correction mechanisms, Data link control protocols, Multiple access protocols and LAN technologies, Network layer functions and services, Routing algorithms: Link-State, Dijkstra's algorithm; IP addressing, subnetting, super netting (CIDR), IPv4, IPv6, and Address resolution protocols: ARP, RARP, BOOTP, DHCP.	10
UNIT 3	Advanced Networking and Routing Protocols: Advanced IP addressing and routing protocols: RIP, OSPF, BGP; Multicast routing and protocols; Quality of Service (QoS) concepts and protocols; and Network security fundamentals.	8
UNIT 4	Transport Layer and End-to-End Protocols: Transport layer services: UDP, TCP; Flow control, congestion control, TCP congestion avoidance algorithms; Session management: Establishment, and synchronization; Presentation layer roles: Data formatting, encryption, decryption	8
UNIT 5	Application Layer Protocols and Network Management: Naming and addressing mechanisms: DNS, URIs; Communication and data transfer protocols: HTTP, SSH, Telnet, SMTP, POP3, IMAP, FTP, SFTP, FTPS; World Wide Web fundamentals; Network management with SNMP, Modern application-layer protocols: WebSockets, MQTT.	8
	Total	42