

Module No.	Unit No.	Topics	Hrs.
1.0		Introduction to Network Architectures, Protocol Layers, and Service models	06
	1.1	Applications of computer networks. Network types: LAN, MAN, and WAN, Network topologies.	
	1.2	Protocols and standards, need of layered protocol architecture, OSI reference model.	
	1.3	TCP/IP architecture: protocol suite, comparison of OSI and TCP/IP	
	1.4	Layer wise network hardware devices (NIC, Repeaters, Hubs, Bridges, Switches, Routers, Gateway and their comparison)	
	1.5	Addressing: physical / logical /port addressing/socket addressing.	
2.0		Physical Layer	04
	2.1	Guided transmission media: comparison among coaxial, optical fiber and twisted pair cables.	
	2.2	Unguided transmission media	
	2.3	Transmission impairments	
	2.4	Broadband standards: Cable modem, DSL, and HFC	
3.0		Data Link Layer	07
	3.1	Data link services: Framing, Flow control, Error control	
	3.2	ARQ methods: transmission efficiency, Piggybacking	
	3.3	High Level Data Link Control (HDLC): HDLC configurations, Frame formats, HDLC bit stuffing and de-stuffing, Typical frame exchanges.	
	3.4	Medium Access Control Protocols: ALOHA, Slotted ALOHA, CSMA, CSMA/CD	
4.0		Network Layer	12
	4.1	Introduction to telephone networks and circuit switching principles.	
	4.2	Introduction to data networks and packet switching principles.	
	4.3	Network layer services and functions.	
	4.4	Internet Protocol: Principles of Internetworking, requirements, IPv4 packet, IPv4 addressing (classful and classless (CIDR))	
	4.5	Routing in Packet Switching Networks: Characteristics, Routing strategies	
	4.6	Routing algorithms: Link state Routing, Distance vector Routing and Path vector routing, Routing protocols: RIP, OSPF, BGP and EIGRP.	
	4.7	Subnetting, supernetting, VLSM, and NAT	
	4.8	Introduction to ICMP, ARP, RARP	
	4.9	IPv6 (IPv6 Datagram format, comparison with IPv4, and transition from IPv4 to IPv6).	
	4.10	Quality of service	
5.0		Transport Layer	06
	5.1	Connectionless and Connection-oriented services at transport layer, Transmission Control Protocol (TCP): TCP Services, TCP Segment, TCP three way handshake	
	5.2	User datagram Protocol (UDP), UDP Services, UDP Datagram	
	5.3	TCP and UDP checksum calculation	
	5.4	Flow control, error control and congestion control	