

2IT02: COMPUTER NETWORKS

CREDITS – 4 (LTP:3,0,1)

Course Objective:

To provide basic knowledge of different types of computer networks, various interfacing standards and protocols.

Teaching and Assessment Scheme:

Teaching Scheme (Hours per week)			Credits	Assessment Scheme				Total Marks
L	T	P		Theory		Practical		
			ESE	CE	ESE	CE		
3	0	2	4	60	40	20	30	150

Course Content:

Unit No.	Topics	Teaching Hours
1	Introduction: Importance of Data Communication, Networks, Protocols and Standards, Line Configuration, Types of Topologies, Transmission Modes, Categories of Networks, OSI model, TCP/IP model, Comparison of OSI and TCP/IP model, Example network: The internet, X.25, Frame Relay.	07
2	Physical Layer: Digital to Analog and Analog to Analog conversion. Multiplexing and spreading techniques. Switching techniques, types of switching, structure of switch, Guided Media and Unguided Media.	05
3	Data Link Layer: Data link Layer Design Issues, Types of Errors, Error Detection & Error Correction techniques, Error control, elementary Data Link Protocols, Sliding Window Protocols, example DLL protocols.	06
4	Medium Access Control Sub Layer: Channel Allocation, Multiple Access Protocols, Ethernet, Data Link Layer Switching : Bridges, local Internetworking, Spanning tree bridges, Remote Bridge, Repeaters, Hub, Switches, routers, Gateway, Virtual LANs.	06
5	Network Layer: Design Issues, Routing Algorithms: Shortest Path Routing, Flooding, Distance Vector Routing, Link State Routing, Broadcast, multicast routing, Congestion Control Algorithms, Quality of Service, Internetworking, Example protocols: OSPF, BGP, Internet multicasting IPv4 and IPv6.	10
6	Transport Layer: The transport service: Services provided to the upper layers, Transport service primitives, Socket, Elements of transport protocols: Addressing, Connection establishment, Connection release, Flow control, Crash recovery, The transport protocol: UDP, TCP.	06

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Unit No.	Topics	Teaching Hours
7	Application Layer: DNS: The DNS name space, Resource records, Name servers, Electronic mail: Architecture and services, User agent, Message formats, Message transfer, Final delivery, World Wide Web: Architectural overview, HTTP.	05
Total		45

List of References:

1. Andrew S. Tanenbaum, “*Computer network*”, Fifth Edition, Pearson.
2. Behrouz Forouzan, “*Data Communication and Networking*”, Fourth Edition, Tata McGraw Hill.
3. William Stallings, “*Data and computer communication*”, Eighth Edition, Pearson.

Course Outcomes (COs):

At the end of this course students will be able to ...

1. Analyze various protocols and network architectures.
2. Examine the OSI layers in a network.
3. Assess network type and its application.
4. Evaluate key networking algorithms in simulation.
5. Identify the different types of network devices and their functions within a network.
6. Design and configure the network.