

NIRMA UNIVERSITY

Institute:	Institute of Technology
Name of Programme:	Integrated B.Tech.(CSE)-MBA
Course Code:	CSI0605
Course Title:	Computer Networks
Course Type:	Core
Year of Introduction:	2021-22

Credit Scheme

L	T	Practical Component				C
		LPW	PW	W	S	
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Course Learning Outcomes (CLO):

At the end of the course, students will be able to –

1. summarize the functionality of different layers of computer network architectures
2. analyze protocols related to various layers
3. design computer network configurations
4. explain the significance of various fields of protocol headers

Syllabus:

Total Teaching hours: 20

Unit	Syllabus	Teaching hours
Unit-I	Introduction: Use of Computer Networks, Connecting devices, Networks and its types, network standards. Network Hardware, Network Software, OSI and TCP/IP Reference Model.	02
Unit-II	Data Link Layer: Introduction and link layer services, Two sublayers, link layer addressing, data link layer protocols, multiple-access protocols: Aloha, CSMA, Ethernet protocols and types of Ethernet	06
Unit- III	Network Layer: Design Issues, packet switching, Routing Algorithms: Shortest Path Routing, Flooding, Distance Vector Routing, Link State Routing, Congestion Control Algorithms, Quality of Service, Example protocols: IPv4 and IPv6, addressing, subnetting, IP Datagram Format, Fragmentation	07
Unit-IV	Transport Layer: Transport Service, transport layer protocols for flow control, Congestion Control, Example protocols: UDP, TCP	03
Unit-V	Application Layer: The Domain Name System, Electronic Mail, World Wide Web, HTTP, FTP, Content delivery.	02

Self-Study:

The self-study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self-study contents

Suggested Readings/
References:

1. Andrew S. Tanenbaum, Computer Networks, PHI Publication
2. Behrouz Forouzan, Data Communication Networking, TMH Publication
3. James Kurose and Keith Ross, Computer Networking: A Top-Down Approach, Pearson
4. Behrouz Forouzan, TCP/IP Protocol suite, TMH Publication
5. William Stallings, Data and Computer Communication, Pearson
6. Jim Kurose, Computer Networking: A top-down approach, Pearson

Suggested List of
Experiments:

Sr. No.	Title	Hours
1	To understand the features of Wireshark as a packet capture tool and understand encapsulation of information. Also study effect of few network commands.	02
2	To study behavior of generic devices used for networking by designing a simple network with multiple nodes and connect via interconnecting devices like hub or switch. Perform simulation and trace communication behavior of specified network devices.	02
3	To implement error detection and correction using HAMMING code concept. Make a test run on input data stream and verify error correction feature.	02
4	To simulate Virtual LAN configuration using CISCO Packet Tracer Simulation	02
5	To configure Wireless LAN using CISCO Packet Tracer	02
6	To implement subnetting by designing multiple subnets with suitable number of hosts. Make a plan to assign static IP addressing across all subnet to explain implementation of subnetting.	04
7	To simulate Static and Dynamic Routing Protocol Configuration using CISCO Packet Tracer.	02
8	To implement echo client server using TCP/UDP sockets	02
9	To configure a network having DHCP server, DNS Server, Web Server and SMTP server	02

Suggested Case List: -NA-