NIRMA UNIVERSITY
Institute of Technology
B.Tech. Computer Science and Engineering
Semester-V

L	T	P	C
3	0	2	4

Course Code	2CS502
Course Title	Computer Networks

Course Outcomes:

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

1. comprehend the functionality of different layers of computer network architectures
2. analyze protocols related to various network architecture layers
3. design computer network configurations
4. simulate various protocols for different types of networks.

Syllabus

Teaching Hours:45

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. **5**

Unit II

Data Link Layer: Introduction and link layer services, Two sublayers, link layer addressing, data link layer protocols, multiple-access protocols: Random-access Protocols, Controlled-access Protocols, Channelization protocols, Ethernet protocols and types of Ethernet, Data Link Layer Switching. **11**

Unit III

Network Layer: Design Issues, packet switching, network layer performance, Routing Algorithms: Shortest Path Routing, Flooding, Distance Vector Routing, Link State Routing, Broadcast, multicast, anycast routing; Congestion Control Algorithms, Quality of Service, Internetworking, Example protocols: IPv4 and IPv6, classful addressing, classless addressing, subnetting, IP Datagram Format, Fragmentation, NAT. **16**

Unit IV:

Transport Layer: Transport Service, transport layer protocols for flow control, Elements of Transport Protocols, Congestion Control, Example protocols: UDP, TCP. **9**

Unit V

Application Layer: The Domain Name System, Electronic Mail, World Wide Web, HTTP, FTP, Content delivery. 4

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.

Laboratory Work:

Laboratory work will be based on the above syllabus with minimum 10 experiments to be incorporated.

Suggested Readings^:

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

L=Lecture, T=Tutorial, P=Practical, C=Credit

^this is not an exhaustive list