

NIRMA UNIVERSITY
School of Technology, Institute of Technology
B.Tech. Electronics & Communication Engineering
Semester - VII

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Course Code	2EC702
Course Title	Computer Networks

Course Outcomes (COs):

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

1. comprehend OSI layer architecture and protocols for wired and wireless networks.
2. apply computer networking standards for network design.
3. evaluate the networking protocols.
4. optimize the Computer network performance using different routing and security algorithms.

Syllabus

Teaching Hours: 45

UNIT I: Introduction to Data Communication and Networking **03**

Data communication, use of Networks, Internet Protocols, and standards, layering of Models, OSI model, Internet model.

UNIT II: Physical Layer **03**

Transmission media (Twisted pair, Coaxial cable, Fiber optic cable), Wireless Medium as Physical Layer (Electromagnetic Spectrum, ISM Band, Lightwave Transmission), Circuit switching, DSL technology, Cable modem.

UNIT III: Data Link Layer **06**

Services to N/W layer, Framing, Bit Stuffing, Character Stuffing, Error control, Flow control mechanism stop & wait, Go-back-, Selective repeat. Example data link protocol HDLC, PPP.

UNIT IV: Medium Access Layer **05**

Channel allocation problem, Multiple Access, CSMA, CSMA/CD, CSMA/CA

UNIT V: Local Area Network **11**

Ethernet, Fast Ethernet, Gigabit Ethernet, Wireless LAN, Blue tooth, ZigBee, Connecting devices- Repeaters, Hub, Bridges, Switch, Router, Gateways, Broadband Wireless Networks, Protocols for satellite communications.

UNIT VI: Network Layer **10**

Packet Switching, Virtual circuits, and datagram, Static and Dynamic Routing Algorithms (Optimality principle, Static Routing Algorithms: Shortest Path, Flooding, Dynamic routing Algorithms: Distance Vector, Link state routing.), Congestion Control, IP Addressing, CIDR & NAT, IP layer protocols (ICMP, ARP, RARP, DHCP, BOOTP), IPv4 and IPv6.

UNIT VII: Transport Layer **03**

Elements of Transport protocols - TCP & UDP

UNIT VIII: Application Layer **04**

DNS- Domain Name System, E-mail, FTP, HTTP, WWW, Firewall, Network Security

Self-Study:

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

Suggested Readings:

1. Computer Networks by Andrew S. Tanenbaum, Prentice-Hall Publication
2. Data Communication and Networking by Behrouz Forouzan, Tata McGraw-Hill Publication

3. Data and Computer Communication by William Stallings, Prentice-Hall Publication
4. Computer Networks by Bhushan Trivedi, Oxford Publication
5. Computer networking: A top-down approach featuring the internet by Kurose, F James, Pearson Education India

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