

Subject Code	Subject Name	Credits
26CS006	COMPUTER NETWORKS	4

Course Objectives:

- Understand the basics of Computer Networks.
- Understanding the functions and interaction of each layer
- Study error detection and correction, flow and error control, routing protocols.
- Developing application-level knowledge.

Learning Outcomes:

On successful completion of the course, students will be able to:

- Understand and explain Data communication systems and its components.
- Explain network architecture.
- Understand and explain the working of different layers of TCP/IP.
- Understand and building the skills of sub-netting and routing mechanisms.
- Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation.

Unit 1 – Introduction (12 hrs.)

Network as an infrastructure for Data Communication. Application of Computer Network, Network Architecture. Types of Computer Networks, Network Protocols and Standards. The OSI reference model, TCP/IP suite, Comparison between OSI and TCP/IP.

Unit 2: Physical Layer (12 hrs.)

Function of Physical Layer, Data and Signals: Analog and Digital Signals. Data Transmission Medium. Bandwidth utilization: Multiplexing and Spreading. Switching: Circuit, Packet and Message. Network Datagrams, Virtual Circuit Networks

Unit 3- Data Link Layer (12 hrs.)

Data Link Layer: Error Detection and Error Correction. Framing, Flow and Error Control. Protocols – Noiseless Channels (Stop and Wait), and Noisy Channels (Stop and Wait and Piggybacking). Multiple Access Protocols: Random Access-ALOHA, CSMA CD/CA. Wired LANs – IEEE. Wireless LANs – Bluetooth.

Unit 4 – Network Layer (12 hrs.)

Function of Network Layer, IPV4 Addressing, Classless and Classfull Addressing. IPV4 Datagram format and Fragmentation. IPV6 Address structure, Routing Algorithms: Distance Vector Routing, Link State Routing. Internet Control Protocols: ARP, RARP, ICMP, Routing protocols: OSPF, BGP, Unicast, Multicast and Broadcast

Unit 5 – Transport and Application Layer (12 hrs.)

Elements of Transport Protocols: TCP/IP Protocol: Addressing, Establishing and Releasing Connection, Flow Control, Error Control. UDP. Application Layer Protocols: DNS, DHCP, WWW, HTTP, HTTPS, TELNET, FTP, SMTP, POP, IMAP.

Reference Books:

1. Andrew S Tanenbaum – Computer Networks, Fourth Edition, Prentice Hall of India
2. B.A Forouzan – Data Communication and Networking, Fourth Edition
3. Computer Networking: A Top-Down Approach – James F. Kurose & Keith W. Ross
4. Data and Computer Communications – William Stallings
5. Computer Networks: A Systems Approach – Larry L. Peterson & Bruce S. Davie