

UNIT-I

Network layer: Logical addressing - IPV4 addresses, Address space, notations, classful and classless addressing with problem solving, NAT, IPV6 addresses; **Network layer: Internet protocol** - IPV4 datagram, fragmentation, checksum and options; IPV6 packet format, advantages and extension headers; Transition from IPV4 to IPV6.

UNIT-II

Address mapping, Error reporting, & Multicasting - Address mapping, ARP, RARP, BOOTP and DHCP; ICMP, IGMP, **Network layer: Delivery, Forwarding, & Routing** – Direct Vs Indirect delivery, Forwarding Techniques, Forwarding Process, Routing Table.; **Unicast routing protocols with problem solving** – Optimization, Intra and Inter domain routing, distance vector routing, link state routing, path vector routing.

UNIT-III

Multicast routing protocols – Introduction, applications, unicast routing vs multicast routing, source based tree routing, group shared tree routing, multicast distance vector.

Transport Layer - Process-to-Process delivery, User Datagram Protocol, Transmission Control Protocol, SCTP-services, features.

UNIT-IV

Congestion control & QOS - Data traffic, Congestion, Congestion control, Two examples – congestion control in TCP and Frame Relay, Quality of Service, Techniques to improve QOS,

Application Layer: Domain Name System - Namespace, Domain name space, Distribution of Name space, DNS in internet, Resolution; **Remote logging** – TELNET; **Electronic mail** – Architecture, User Agent, Message Transfer Agent: SMTP; **File transfer** - File transfer protocol (FTP);.

UNIT-V

Network Management: SNMP - Network management system; Simple Network Management Protocol – concept, management components. **Network Security** - Security Services, Message confidentiality, Message integrity, Message Authentication, Digital Signature, Entity Authentication

Text Books:

1. Behrouz A. Forouzan, Data Communications and Networking, Fourth Edition, Tata McGraw-Hill, 2006.

Reference:

1. Alberto Leon-Garcia and Indra Widjaja, Communication Networks –Fundamental Concepts and Key architectures, Second Edition, Tata McGraw-Hill, 2004.
2. Wayne Tomasi, Introduction to Data Communications and Networking, Pearson Education, 2005.

Course Outcomes (COs):

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

1. Identify and solve the problems associated with transition from IPV4 to IPV6. (PO-1, 2, 3) (PSO-1, 2)
2. Use different protocols to achieve Address mapping, Error reporting & routing. (PO-1, 2, 3, 5) (PSO-2)
3. Paraphrase different transport layer protocols and analyze different techniques to improve QOS (PO-1, 2, 3) (PSO-2, 3)
4. Describe the working of various application layer services. (PO-2, 3) (PSO-2)
5. Analyze different cryptographic techniques for securing the data and network. (PO-1, 2, 3) (PSO-1, 2)