

3/4 Year B. Tech SIXTH SEMESTER

EM6T3

COMPUTER NETWORKS

Credits: 4

Lecture: 4 periods/week

Internal assessment : 30 marks

Tutorial: 1 period /week

Semester end examination: 70 marks

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**Course Objectives:**

- Build an understanding of the fundamental concepts of computer networking.
- Familiarize the student with the basic taxonomy and terminology of the computer networking area.

**Learning Outcomes:**

Students will be able to

- Understand the reference models including OSI, TCP/IP, types of networks and network topologies.
- Understand message transfer protocols including SMTP, POP3, and IMAP
- Understand transport services and transfer protocols TCP, UDP and their use in real time scenarios.
- Understand CSMA, CSMA/CD protocols, and functionality of devices including bridges, routers, switches and gateways.
- Implement techniques including framing, error detection, correction and flow control protocols.

UNIT I

**Introduction** :Overview of the Internet –Networks, Switching, The Internet, Accessing the Internet, Hardware and Software Protocol Layering-TCP/IP Protocol suite, The OSI Model.

UNIT II

**Application Layer**:Introduction, Client-Server Paradigm and Applications-HTTP,FTP, Electronic mail, TELNET, Secure Shell, Domain Name System, Peer –to-Peer Networks.

UNIT III

**Transport Layer** :Introduction, Transport Layer Protocols, User Datagram Protocol(UDP),Transmission Control Protocol(TCP).

UNIT IV

**Network Layer**: Introduction, Network Layer Protocols, Unicast Routing, Multicast Routing,IPV6.

UNIT V

**Data Link Layer** :Introduction, Data Link Control(DLC),Multiple Access Protocols(MAC),Link Layer Addressing, Wired LANs – Ethernet Protocol, Other Wired Networks, Connecting Devices & Wireless LANS, Mobile IP.

UNIT VI

**Physical Layer** :Data and Signals, Digital Transmission, Analog Transmission, Bandwidth Utilization and Transmission Media.

UNIT VII

**Multimedia, Quality of Service and Network Security:** Compression , Multimedia Data, Quality of Service, Introduction, Confidentiality, Other Aspects of Security, Internet Security and Firewalls.

UNIT VIII

**Socket Programming** :Introduction, Programming with UDP, Programming with TCP.

**Learning resources**

**Text Books**

1. Computer Networks: A Top –Down Approach, Behrouz A.Forouzan and Firouz,Mosharraf,2012,Tata McGraw Hill.

**Reference Books:**

1. Computer Networking : A Top Down Approach Featuring the Internet, Kurose & Rose,3<sup>rd</sup> Edition,Pearson.
2. Computer Netwoks A Systems Approach,5/e, Larry L.Pererson and Bruce S.Davie, Morgan Kaufmann(Elsevier)
3. Data and Computer Communication ,Eighth Edition, William Stallings, Pearson.