

3/4 B.Tech. FIRST SEMESTER

IT5T2

COMPUTER NETWORKS

Credits: 4

Lecture: 4 periods/week

Internal assessment: 30 marks

Tutorial: 1 period /week

Semester end examination: 70 marks

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.
- Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.

Outcomes:

Students will be able to

- Understand the reference models including OSI, TCP/IP, types of networks and network topologies.
- 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.
- Understand transport services and transfer protocols TCP, UDP and their use in real time scenarios.
- Understand message transfer protocols including SMTP, POP3, and IMAP.

Syllabus:

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.

Text Book:

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, 3rd Edition, Pearson.
2. Computer Networks 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.