III/IV B. TECH. FIRST SEMESTER
COMPUTER NETWORKS
(Required)

Course Code : CS 5T3	**Credits: 3**
Lecture: 3 periods/ week	**Internal assessment: 30 Marks**
Tutorial: 1period/week	**Semester end examination: 70 Marks**

Prerequisites: Fundamental Operating System Concepts , Introduction to C Programming and Data Structures

Course Objectives:

- Familiarize the student with the basic taxonomy and terminology of the computer networking area.
- Introduce the students to basic principles of networking using the goals like protocol layering and top down approach.
- Build an understanding of the basics of the internetworking and routing used in the computer networks.
- To provide guidelines in developing network applications

Course Outcomes:

After completing this course the student must demonstrate the knowledge and ability to :

CO1) Independently understand basic computer network technology

CO2) Identify the different types of network topologies.

CO3) Enumerate the layers of TCP/IP. Explain the functions of each layer

CO4) Familiarity with the protocols of computer networks and routing mechanisms

CO5) Classify different types of physical layer transmissions and various transmission media.

Syllabus:

UNIT 1

Introduction: Overview of the Internet, Networks, LAN , WAN ,point to point WAN, Switched WAN, Switching, Switched network, circuit switched network, packet switched network,

Protocol Layering: TCP/IP protocol suite, Layers in TCP/IP, The OSI Model, Description of each layer, OSI reference model definition, comparison of TCP/IP and OSI model.

UNIT 2

Introduction: Providing Services , Standard Application layer protocols, Application layer paradigms, Overview of Client server paradigm and Peer to peer networks.

Standard Client Server Applications like WWW its architecture, url HTTP – no persistent versus persistent connections, message formats FTP-communication

over data connection, architecture, file transfer examples , sending & receiving mail and

Overview of SMTP, Telnet , NVT,SSH ,DNS

UNIT 3

Introduction to transport layer ,Transport layer protocols, User Datagram Protocol, Transmission control protocol:

UNIT 4

Network layer: Introduction ,Network Layer Services, Packet Switching , Network Layer Performance, Network Layer Congestion.

Network layer protocols-IPv4 Datagram Format, IPV4 Addresses notation , Classful Addressing, Classless Addressing, Subnetting, NAT, ICMPv4. IPv6,Packet Format , Addressing, Translation from IPV4 to IPV6

Routing algorithms like DV, Link state, dijkstra's spanning trees.

UNIT 5

Data Link Layer: Introduction to DLC, Nodes and Links, Types of Links.

DLC: Framing, Flow and Error Control, Error Detection and Correction :Types of Errors
Coding :Block coding , linear coding , cyclic coding.

Overview of Two DLC Protocols: HDLC , PPP.

MAC protocols: Aloha, CSMA , CSMA / CD, CSMA/CA, controlled access,
Wired LANS-Ethernet protocol
Physical Layer: Transmission media, Guided media :twisted pair cable, coaxial cable, fibre optic cable and Unguided media

Learning Resource

Text Books

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

References
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. Peterson and Bruce S. Davie, Morgan Kaufmann(Elsevier).
3. Data and Computer Communication, Eighth Edition, William Stallings, Pearson.