3/4 B.Tech. SECOND SEMESTER
COMPUTER NETWORKS

CS6T1 **Required** **Credits: 4**
Lecture: 4 periods/week **Internal assessment: 30 marks**
Tutorial: 1 period /week **Semester end examination: 70 marks**

Course context and Overview: Internet is the largest computer network used by billions of users. Computer network gives overview of the Internet as a network of networks, discuss components that makeup the Internet. This also introduces protocol layering and its details. It also gives pertinent information about networks different protocols used, administration of networks,

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Prerequisites: Data Structures, Operating Systems, Probability and Statistics
Objectives:

1. To Understand Types of Networks, connections, Internet structure, protocol layering in TCP/IP and in OSI Model.
2. To Explain the Services provided by the Internet as well as the Client-Server Paradigm.
3. To Identify the General Services and Protocols and to understand the design of TCP and UDP.
4. To discuss the services, performance and structure of the protocols and the latest version of IP.
5. To understand the concept of node, services, approaches, addressing at the link – layer and introduce the wireless LAN's, Networks and Mobile access.
6. To explain about signals, data, digital transmission, multiplexing and transmission media.
7. To Discuss compression of Audio and video, elements of multimedia related concepts (QOS), Network security services, goals and firewalls.
8. To Identify main issues of entities in programming between client-server basing on UDP and TCP.

Learning Outcomes:

Ability to:

1. Describe the basic networking principles and layered architectures
2. Summarize various application layer protocols
3. Outline the process to process communication mechanism using UDP, TCP, AND SCTI
4. Illustrate the versions of Internet Protocol and their address translation.
5. Understand various issues related to host to host transmission.

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

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