Prasad V. Potluri Siddhartha Institute of Technology, Kanuru, Vijayawada.

1/2 M.Tech. SECOND SEMESTER

CSCS2T4 COMPUTER NETWORKS Credits: 4

Lecture: 4 periods/week Internal assessment: 30 marks

Tutorial: 1 period /week Semester end examination: 70 marks

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:

1. Understand the fundamentals of data communication and communication networks.
2. Have knowledge of various network protocols including TCP/IP, and demonstrate the skills to design and evaluate network protocols.
3. Be able to discuss major trends in industry and current research activities within the discipline.
4. Apply the principles of data communication and communication network techniques to design and evaluate new protocols.
5. Skills to implement networking protocols using TCP/IP based on socket programming.
6. Demonstrate independent learning and analyzing skills by using new IETF standards to solve technical problems. Have basic understanding of network security issues, Multimedia concepts and Firewalls.

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, Internet History.

UNIT - II

Application Layer : Introduction, Client-Server Paradigm and Applications-World Wide Web & 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, Next Generation IP.

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.

UNIT - VI

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

UNIT - VII

Multimedia and Quality of Service: Compression, Multimedia Data, Multimedia in the Internet, Real-Time Interactive Protocols and Quality of Service.

UNIT - VIII

Network Security: Introduction, Confidentiality, Other Aspects of Security, Internet Security and Firewalls.

Learning Resources

Text Book:

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, Andrew S. Tanenbaum, 4th Edition, Pearson Education/PHI.
3. Computer Networks A Systems Approach, 5/e, Larry L. Peterson and Bruce S. Davie, Morgan Kaufmann (Elsevier).