

# COMPUTER NETWORKING:

## IT 402

### Teaching Scheme (Credits and Hours)

Teaching scheme				Total Credit	Evaluation Scheme					
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract.	Total
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
04	00	02	06	05	03	70	30	20	30	150

### Learning Objectives:

The educational Objectives of this Course are:

- Introduction to OSI and TCP/IP model
- Study of all layers in detail
- Understanding flow of packets in OSI

### Outline Of the Course:

Sr. No	Title of the Unit	Minimum Hours
1	OSI Reference Model and Architecture	12
2	TCP/IP	12
3	Local Area Networks	12
4	Wide Area Networks	12
5	Introduction to Network Management	12

**Total hours (Theory): 60**

**Total hours (Lab): 30**

**Total hours: 90**

## Detailed Syllabus

Sr. No	Topic	Lecture Hours	Weight age(%)
1	<b>OSI Reference Model and Network Architecture:</b> Introduction to Computer Networks, Example networks ARPANET, Internet, Private Networks, Network Topologies: Bus-, Star-, Ring-, Hybrid -, Tree -,Complete -, Irregular – Topology; Types of Networks : Local Area Networks, Metropolitan Area Networks, Wide Area Networks; Layering architecture of networks, OSI model, Functions of each layer, Services and Protocols of each layer	12	18
2	<b>TCP/IP</b> Introduction, History of TCP/IP, Layers of TCP/IP, Protocols, Internet Protocol, Transmission Control Protocol , User Datagram Protocol, IP Addressing, IP address classes, Subnet Addressing, Internet Control Protocols, ARP, RARP, ICMP, Application Layer, Domain Name System, Email – SMTP, POP,IMAP; FTP, NNTP, HTTP, Overview of IP version 6.	12	20
3	<b>Local Area Networks</b> Introduction to LANs, Features of LANs, Components of LANs, Usage of LANs, LAN Standards, IEEE 802 standards, Channel Access Methods, Aloha, CSMA, CSMA/CD, Token Passing, Ethernet, Layer 2 & 3 switching, Fast Ethernet and Gigabit Ethernet, Token Ring, LAN interconnecting devices: Hubs, Switches, Bridges, Routers, Gateways.	12	22
4	<b>Wide Area Networks</b> Introduction of WANs, Routing, Congestion Control, WAN Technologies, Distributed Queue Dual Bus (DQDB), Synchronous Digital Hierarchy (SDH)/ Synchronous Optical Network (SONET), Asynchronous Transfer Mode (ATM), Frame Relay, Wireless Links.	12	22
5	<b>Introduction to Network Management</b> Remote Monitoring Techniques: Polling, Traps, Performance Management, Class of Service, Quality of Service, Security management, Firewalls, VLANs, Proxy Servers, Introduction to Network Operating Systems: Client-Server infrastructure, Windows NT/2000	12	18
<b>Total</b>		<b>60</b>	<b>100</b>

### Instructional Method and Pedagogy:

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lecture and laboratory which carries 10 marks in overall evaluation.

- One internal exam will be conducted as a part of internal theory evaluation.
- Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
- Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.

### **Learning Outcome:**

On successful completion of the course, the student will:

- Be able to understand network topologies
- Capable of understanding flow of data in network viz. layers
- Understanding network management

### **Reference Books:**

1. Computer Networks (3rd edition), Tanenbaum Andrew S., International edition, 1996.
2. Data Communications, Computer Networks and Open Systems (4th edition), Halsall Fred, 2000, Addison Wesley, Low Price Edition

### **List of experiments:**

<b>Sr. No</b>	<b>Name of Experiment</b>
1	Demonstrate to establish client-server connection with use of windows server 2008.
2	Use of policies in windows server 2008
3	Overview of Router
4	Demonstrate use of router to make a connection
5	Introduction to network address Translation
6	Implementing IP subnetting in IPV4
7	Implementing IP routing using RIP
8	Implementing IP routing using IGRP
9	Configuration of VLAN
10	Configuration of VTP
11	Overview of MPLS