

**Course Name** : Computer Engineering Group  
**Course Code** : CO/CM/IF/CD  
**Semester** : Fourth Semester  
**Subject Title** : Computer Networks  
**Subject Code** : 12110

**Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS.	TH	PR	OR	TW	TOTAL
03	--	02	03	100	--	--	25@	125

**NOTE:**

- Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.
- Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work. (SW)

**Rationale:**

Today is age of Information Technology. In many applications, we send information from one place to another place. So networking of computer is very essential. The many business applications like Railway reservation, Industrial sale, purchase, Industrial automation, on line Banking, E-business, E-Commerce and many applications. All this applications and many other require knowledge of computer network.

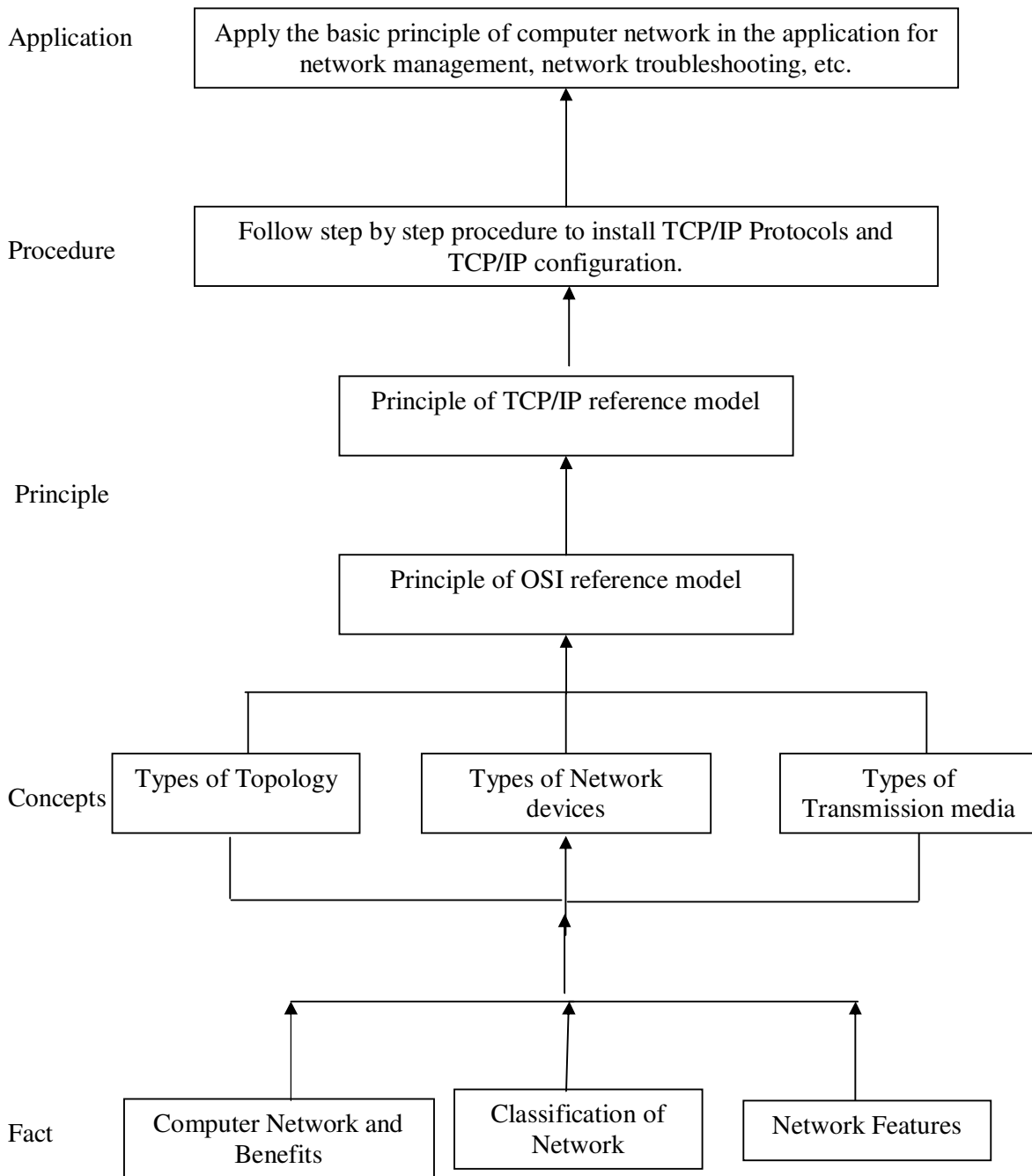
Computer network organize information from hundreds of offices spread over wide geographical area and output remote information at a push of button. This gives type of network. Two or more computer interconnected through via copper wire, fiber optics, microwave, infrared and satellite i.e. wire and wireless communication.

Here we set basic concept of networking, its applications, topologies, communication media, network directing devices, protocol used, OSI reference model and TCP/IP model.

**Objective:** Students will be able to:

1. Identifying the benefits of network.
2. Distinguish between Network classifications.
3. Describe different types of Topology.
4. Describe different types of Network devices.
5. Compare different transmission media.
6. Compare OSI and TCP/IP model.
7. Configure TCP/IP.

**Learning Structure:**



**Contents: Theory**

<b>Chapter</b>	<b>Name of the Topic</b>	<b>Hours</b>	<b>Marks</b>
01	<b>Basic Network Concepts:</b> 1.1 Understanding Network - Human Networks; Computer Networks; Network Plan. 1.2 Identifying the Benefits of Network - Sharing Information; Sharing Resources; Facilitating Centralized Management – Managing Software, Maintaining the Network, Backing Up Data. 1.3 Distinguishing Between Network classifications - Classifying Networks by their Geography – LAN, MAN, WAN; Classifying Networks by their Component Role - Peer to Peer, Server based Network. 1.4 Network Features - File Sharing; Printer Sharing; Application Services; E-Mail; Remote Access.	10	22
02	<b>Network Topologies and Networking Devices:</b> 2.1 Type of Topology - Bus Topology; Ring Topology; Star Topology; Mesh Topology; Tree Topology; Hybrid Topology. 2.2 Network Control Devices -Hubs; Switches; Routers; Bridges; Repeaters; Gateways; Modems	10	22
03	<b>Transmission Media:</b> 3.1 Guided Media -Twisted Pair -UPT, STP; Coaxial Cable; Optical Fiber - Optical Fiber Structure, Light Source for Fiber, Propagation Mode, Advantages of optical fiber, Disadvantages of optical fiber. 3.2 Un-Guided Media: Wireless Communication – Communication Band; Microwave Communication; Satellite Communication – Access Method; Cellular (Mobile) Telephone – Band in Cellular Telephony, Calls Using Mobile Phones, Transmitting receiving operations; New Developments.	08	18
04	<b>Network Reference Model:</b> 4.1 OSI Reference Model - Interlayer Communication – Data Encapsulation, Horizontal Communication, Vertical Communication, Encapsulation Terminology; Physical layer; Data link layer; Network layer; Transport layer; Session layer; Presentation layer; Application layer. 4.2 TCP/IP Reference Model – Link; Internet; Transport; Application layer. 4.3 Comparison of the OSI and TCP/IP reference models.	12	22
05	<b>TCP/IP Fundamentals:</b> 5.1 TCP/IP Protocols - SLIP and PPP; ARP; IP; ICMP; TCP and UDP. 5.2 IP Addressing - IP Address Assignments; IP Address Classes; Subnet Masking; Registered and unregistered Addresses.	08	16
<b>Total</b>		<b>48</b>	<b>100</b>

**Practical:**

Skills to be developed:

- 1) Intellectual skills
  - Understanding of basics concept of network.
  - Comparison of different network.
  - Installation of protocols.
- 2) Motor skills
  - Proper handling of Computer System hardware.

**LIST OF PRACTICAL:**

- 1 To know your Network Lab
- 2 To connect Computers in different ways in a Local area Network ( Topologies)
- 3 To connect and understand different network control devices used in a Local Area Network
- 4 To study transmission media.
- 5 To create a network cable using RJ-45 connectors.
- 6 To connect two hubs by creating crossover connection
- 7 To install a network interface card
- 8 To install TCP/IP protocol and configure advanced TCP/IP properties
- 9 To locate MAC address of Computer
- 10 To install a network printer
- 11 To deliver a 5 minutes seminar by each student on latest trends in Computer Networks
- 12 To arrange Industrial Visit to observe resource sharing

**Learning Resources:****1. Books:**

Sr. No.	Title	Author	Publication
01	Computer Networks	Andrew S. Tanenbaum	Tata McGraw-Hill Edition
02	Introduction to Networking	Richard A. McMohan, Sir	Tata McGraw-Hill Edition
02	Networking + Certification (Second Edition)	Microsoft Press	--
03	Complete Reference Networking	Craig Zacker	Tata McGraw-Hill Edition
04	Data Communication and Networking	Achyut S. Godbole	Tata McGraw-Hill Edition
05	Data Communication	Behrouz Forouzan	Tata McGraw-Hill Edition

**2. CDs:**

Book of Microsoft Certified Software Engineering (MCSE) of Microsoft Publication gives CD. Demonstration of this CD for understanding basic concept.