



**Paper Code : DCN:503**

**Paper Name : Data Communications & Computer Networks**

Teaching Hours (Per Week)		Examination Scheme		
TH. (hours)	Pr. (hours)	Internal	External	Total
		Th. (marks)	Th. (marks)	100 (marks)
4		30	70	

**Lectures = 68 Hours**

**Objectives:**

This syllabus is aimed to impart a basic understanding of how computers communicate using different devices and protocols. A student will learn the technologies of connecting the different devices and how data transmission operates in a computer network. Some of the most practical applications of the internet will also be studied.

**UNIT-I**

**(17 Hrs.)**

Data communication, communication system, Signal and Data, Analog and Digital Signals,

Networking: Needs and Advantages, Network, Types- Client, Server and Peers, introduction to various types of servers, client/server architecture.

Transmission Media types: Wired & Wireless transmission, properties & speciality of various media – types, comparative study.

Classification of Networks: LAN, MAN, WAN

Network Topology: Bus, Star, Ring, Star bus, Star ring, Mesh – Features, Advantages and disadvantages of each type.

Transmission technology: Signal Transmission, Digital signalling, Analog Signalling,

Transmission Modes: simplex, half duplex and full duplex, Asynchronous & synchronous Transmission, Parallel and Serial Transmission, Base band and Broadband transmission.

**UNIT-II**

**(14 Hrs.)**

Connectivity Devices: Modem, Repeater, NIC, Network adapters, Connectors, Transceiver, Hub – Active, Passive and Intelligent, Bridge-Local, Remote, Wireless, Routers-Static and Dynamic, Switches, Routers and Gateways, NOS.

Real World Networks: Ethernet, Fast Ethernet, Token Rings, FDDI, ATM, ARCnet and AppleTalk.

IEEE 802 standards: 802.3, 802.4, 802.5

Addressing: physical, port, logical

Addresses (IPv4): classfull and classless Addressing, subnetting, NAT, IPv6

**UNIT-III**

**(17 Hrs.)**

Standards Organizations, Protocols and Standards

OSI reference model



TCP/IP suite  
Comparison between OSI and TCP/IP Models,  
TCP/IP protocols: IP, ARP, RARP, ICMP, TCP, UDP  
TCP/IP Services Protocols: DHCP, DNS, FTP, TFTP, SMTP, TELNET, and NFS.  
WWW, URL, e-mail, HTTP, Subnet & subnet mask.

**UNIT-IV**

**(8 Hrs.)**

Modulation: PCM, ASK, FSK, PSK  
Connectionless and Connection oriented Services,  
Multiplexing: FDM, TDM, CDM and WDM  
Switching: circuit, Packet, and message switching  
Routing : routing methods, routing protocols: distance vector, link state, path vector  
Transmission impairments, flow control and error control

**UNIT- V**

**(12 Hrs.)**

Network Security: Network security issues, approaches to network security, hacking.  
Firewalls: types of firewall technology- network level and application level, IP packets filter screening routers, limitations of firewalls.  
Encryption and Decryption – Cryptography, Public/Private key encryption.  
Overview of Digital Signature and Digital Certificates technology  
Network building blocks required for setting up a small LAN using Windows in an office, Hardware & software required, Simple Installation and configuration of Networking under Windows.  
Some basic networking configuration using Windows 2003 Server and clients, Simple network administration.

**Text Books:**

1. Fourauzan B., "Data Communications and Networking", 3rd edition, TataMcGraw-HillPublications, 2004, ISBN 0 – 07 – 058408 – 7
2. Tanenbaum A., "Computer Networks", 4th Edition, PHI, ISBN 81 – 203 –2175 – 8
3. **Douglas E. Comer**, " Internetworking with TCP/IP, principles, protocols and architecture"

**Reference Books:**

1. Keshav S., "An Engineering Approach to Computer Networking", Pearson Education, ISBN 981 – 235 – 986 – 9
2. Comer D., "Computer Networks and Internet", 2<sup>nd</sup> Edition, Pearson Education, ISBN 81– 7808 – 086 – 9
3. S.K. Basandra & S. Jaiswal, "**Local Area Networks**", Galgotia Publications
4. William Stallings, "**Data and Computer Communication**"
5. **Douglas E. Comer, David L. Stevens** " Internetworking with TCP/IP"
6. "Computer Networks", Uyles Black
7. "Data and Computer Communication", William Stallings