Paper Code : DCN 601

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:

To learn and understand fundamentals of computer network
To learn and understand network architectures, protocols and applications

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, Brouters 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

Reference Books:

1. Keshav S., "An Engineering Approach to Computer Networking", PearsonEducation, ISBN 981 – 235 – 986 – 9
2. Comer D., "Computer Networks and Internet", 2ND Edition, PearsonEducation, ISBN 81– 7808 – 086 – 9
3. S.K.Basandra & S. Jaiswal, **"Local Area Networks",** Galgotia Publications
4. William Stallings, **"Data and Computer Communication"**