

**Core Course XIV - Computer Networks**

**Unit I**

Computer Networks - Applications - Line configuration - Topology - Transmission Modes - Categories of Network: LAN, MAN, WAN - OSI Layer. Physical Layer: Signals - spectrum - bandwidth of analog/digital signals – signal encoding - DTE-DCE interface - Transmission Media - Multiplexing : FDM, TDM.

**Unit II**

Data Link Layer: Error Detection - Error correction - Line discipline Flow Control: stop - wait protocol and sliding window protocol Error control: ARQ, Go-back-n ARQ, selective - repeat ARQ. Data Link Protocols: Asynchronous protocols – synchronous protocol: character oriented - bit oriented protocols - HDLC. LLC, MAC, PDU. MAN: DQDB - SMDS.

**Unit III**

Network Layer: Circuit switching - packet switching - message switching - Connection oriented and connectionless services. Routing Algorithms – congestion control Algorithms - internetworking - Routers and Switches - Introduction to firewalls- Wide Area Network - X.25 - Frame Relay - Frame relay - Protocol Architecture - Frame relay call control - User Data Transfer Network Function – CongestionControl.

**Unit IV**

LAN Protocols: Ethernet - Token Ring - Token Bus - FDDI - Addressing and Frame format – Bridges - LAN Security: Types of threats - Levels of security Case Study: Novell Netware - Wireless LAN: need - components - Receiving Devices - advantages &disadvantages

**Unit V**

TCP/IP Networking : TCE/IP Architecture - Structural overview – Inter networking model - Protocol evolution - Division of functions - Network characteristics - implementation characteristics - Network addressing and Routing: Datagram Header - IP address space - Basic routing consideration -Hardware addressing – Common interior Gateway Protocols - Internet control Message Protocol. Transport Layer: Data flow, ports, sockets - user Data gram protocol - Transmission control protocol - TCP Header - connection establishment and termination - TCP Reliable Delivery & Flow control - Applications and services: Domain name system - Remote Logon – Mail Exchange - File Transfer - Remote Procedure Call - Remote File Access - Security - Window system.

**Text Book(s)**

Data Communication and Networking, Behruz A. Ferouzon, Tata McGraw, 2004.

**References**

1. Computer Networks - III edition - Andrew S.Tanenbaum - Pearson Edun. 1998.
2. Data and Computer Communication – William Stallings, Pearson Education, 5<sup>th</sup> Edition, September 2000.