CS 208: DATA COMMUNICATION (3-0-2: 4)

Overview : Objectives and Applications of Computer Communication. Computer Communication Network Architecture **:** ISO - OSI reference model, design philosophy, layer, protocol, interface, and service concepts. Layer - wise functionality.

Physical Layer : Concepts of Data and Signals, Analog and Digital Data Transmission, Bandwidth utilization : Multiplexing techniques, Transmission Media, Switching Techniques and Telephone and Cable Networks for Data transmission.

Data link layer : Framing and Coding techniques, Error Detecting and Correcting Codes, data link control protocols and their performances. Medium Access Control in broadcast networks : ALOHA, CSMA, CSMA/CD, token ring, token bus. Wired LANs : Ethernet, Connecting Devices, Backbone Networks, Standard LAN Protocols (IEEE 802.X). Wireless LANs and WANs : IEEE 802.11, Bluetooth, Cellular telephony, satellite networks. SONET/SDH, Frame Relay and ATM.

Suggested List of Laboratory Experiments:

1. Experiments on Analog Modulations : AM, FM and PM
2. Experiments on Digital Modulations : PAM, PCM, ASK, FSK, PSK and QPSK
3. Experiments on Multiplexing: FDM & TDM
4. Implement Error detecting and Error correcting codes
5. Implement Framing techniques
6. Implementation flow control algorithms: ARQ, Go Back N, Selective Repeat
7. Implement CSMA/CD between two machines
8. Implement Token ring between 3 machines.
9. Study and Configuration of Hubs, Switches, Routers.

Text Books :

1. B. Forouzan, “Data Communication and Network”, McGraw-Hill Publications.
2. W. Stalling, “Data and Computer Communication”, PHI (EEE).

References :

1. A. S. Tanenbaum., “Computer Networks”, Pearson Education Asia.
2. A. L. Garcia and I. Widjaja, “Communication Networks: Fundamental Concepts and Key Architectures”, Tata McGraw-Hill.