

CS-5001 DATA COMMUNICATION

RATIONALE: The purpose of this subject is to cover the underlying concepts and techniques used in Data communication. In this subject, various principles, standards for communication over different type of Communication Media are discussed.

PREREQUISITE :- The students should have general idea about the analog and digital communication.

UNIT :- I

Data Communication: Introduction, Components, data representation, data flow and basic model , Serial & Parallel transmission , Modes of data transmission, Encoding: Unipolar, Polar, Bipolar, Line & Block codes. Data compression: Lossy & Lossless techniques. Review of analog & digital transmission methods.

UNIT:-2

Multiplexing: Introduction & History, FDM, TDM, WDM, Synchronous & Statistical TDM. Spread

spectrum: Frequency Hopping & Direct Sequence. Terminal handling & Polling. Network Switching

Techniques: Circuit, Message, Packet & Hybrid. X.25, ISDN.

UNIT:-3

Physical Layer: Introduction, Interface, Standards, EIA-232-D, RJ-45, RJ-11, BNC connector & EIA-449 digital Interface: Connection, specifications & configuration. Modem: Types, features, signal constellation, block schematic. Connecting Devices: Active and Passive Hubs, Repeaters, Bridges, Two & Three layer switches & Gateway. Network Topologies and their comparative study.

UNIT:-4

Transmission Media: Transmission line characteristics, distortions, Crosstalk. Guided Media: Twisted Pair, Baseband & Broadband Coaxial, Fiber Optic Cable. Unguided media: Electromagnetic polarization , Rays and waves front , Electromagnetic spectrum, Radiation & Propagation of Waves, Inverse square law , Wave attenuation and absorption, Terrestrial Propagation, Skip distance , Radio waves, Microwave, Infrared & Satellite Communication system . Telephone Network: Components, LATAs, signaling and Services, Digital Subscriber Line: ADSL, HDSL, SDSL, VDSL, Cable TV network for data transfer.

UNIT:-5

Transmission Errors : Content Error , Flow integrity error , Error detection ,Error correction , Bit error rate. Error detection & Correction methods: Parity checking, Checksum Error Detection, Cyclic Redundancy Check , Hamming Distance , Interleaved codes , Block Parity , Convolution code, Hardware Implementation, Checksum .

Suggested Text Books:

1. Gupta Prakash C. "Data communication", PHI Learning
2. Forouzan, "Data communication and Networking", 5e, TATA Mc Graw
3. Godbole A., "Data Communication & Network" , TMH
4. Miller, " Data Network and Communication", Cengage Delmar Learning
5. Stallings William, "Data & Computer Communication", Pearson Education

Suggested Reference Books:

1. Tanenbum A.S. "Computer Network", Pearson Education.
2. Kennedy G., "Communication Systems" MGH