CS-501 – Data Communication

Branch: Computer Science and Engineering V Semester
Course: CS 501 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 Comunication", 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