EES-807: Data Communication and Computer Networks

Credit	L	T	P
4	3	1	-

UNIT –I

Data Communication System: Introduction, Purpose, Components; Concepts of Frequency, Spectrum, and Bandwidth; Bit Rate and Baud Rate, Bandwidth of a Transmission System, Channel Capacity, Nyquist and Shannon Theorems, Throughput, Latency, Jitter, Transmission Impairments - Attenuation, Distortion, Noise: Modes of Digital Data Transmission,

UNIT -II

Transmission Media: Guided Media - Twisted Pair, Co-Axial Cables, Optical Fiber, Wireless Transmission – Antennas, Use of Frequency Spectrum, Terrestrial Microwaves, Satellite Microwaves, Wireless Propagation- Line-of-sight Transmission, Communication Satellites.
Error Detection and Correction: Types of Errors: Single-Bit Error, Burst Error; Block Coding, Process of Error Detection and Error Correction in Block Coding, Parameters of a Coding Scheme, Minimum Hamming Distance for Error Detection and Error Correction, Linear Block Codes, Simple parity Check Code.

UNIT -III

Computer Networks: Network Topologies, IEEE LAN standards, Metropolitan Area networks, Wide Area Networks, Internetworks, Overview of OSI Reference Model, TCP/IP Protocol Suite, Comparison OSI and TCP/IP models, Addressing Schemes, Dotted Decimal Notation, Classful and Classless Addressing, IPv4 and IPv6 addressing.

UNIT -IV

Medium Access Control: Multiple Access Protocols at Data Link Layer, Random Access: ALOHA, Slotted ALOHA, Carrier Sense Multiple Access (CSMA), CSMA/CD, CSMA/CA; Controlled Access: Reservation, Polling, Token Passing; Channelization: Frequency Division Multiple Access (FDMA), Time Division Multiple Access (TDMA), Code Division Multiple Access (CDMA).

UNIT -V

Data and Network Security: Symmetric Key Cryptography, Traditional Cyphers, Substitution Cypher, Shift Cypher, Transposition Cypher, Simple Modern Cyphers, XOR Cypher, Rotation Cypher, Substitution Cyphers, S-box and P-box Cyphers, Modern Round Cyphers; Asymmetric Key Cryptography, RSA and Diffie-Hellman Algorithms; Network Security Services: Message Confidentiality, Message Integrity, message Authentication, Digital Signature.

TEXT/REFFERENCE BOOKS

1. Andrew S. Tanenbaum, David J. Wetherall,“Computer Networks,” 5th Edition, Pearson Education, India, 2012.
2. Behrouz A. Forouzan, “Data Communication and Networking,” 5th Edition, Mc Graw Hill, India, 2013.
3. William Stallings, “Data and Computer Communications,” 10th Edition, Pearson Education, Inc., NJ.