

3/4 Year B. Tech -SIXTH SEMESTER
ELECTIVE – I

EM6T4A

DATA COMMUNICATION

Credits:3

Lecture: 3 periods/week

Internal assessment : 30 marks

Tutorial: 1 period /week

Semester end examination: 70 marks

Course Objectives:

- To understand the fundamental concepts, principles, and terminology of various Routing Techniques, communication protocols and Topology's.

Learning Outcomes:

At the end of this course the Students will be able to

- Learn the basic elements of data communication system.
- Understand communication protocols and data transmission modes.
- Understand the use of computer network switching.
- Known different components of computer network identify different types of network.
- Describe About Asynchronous Transfer Mode, Different Routing Techniques.

Unit-I

An Introduction to Data Communications: A Communications Model, Data Communications and Data Communications Networking, Protocols and Protocol Architecture, Characteristics of Data Transmission: Concepts and Terminology, Analog and Digital Data Transmission, Transmission Impairments

Unit-II

Transmission Media: Guided Transmission Media, Wireless Transmission Data Encoding, Digital Data, Digital Signals, Digital Data, Analog Signals, Analog Data, Digital Signals, Analog Data, Analog Signals

Unit-III

The Data Communication Interface: Asynchronous and Synchronous Transmission, Line Configurations, Interfacing. Data Link Control Flow Control, Error Detection, Error Control, High-Level Data Link Control (HDLC), Other Data Link Control Protocols.

Unit-IV

Data Communications Hardware: Terminals Introduction, Basic Terminal Components, Enhanced Terminal Components, General-Purpose Terminals, Remote Job Entry Terminals, Transaction Terminals, Clustering of Terminal Devices. Communications Processing Hardware, Multidrop Lines, Multiplexers, Concentrators, Front-End Processors.

Unit-V

Multiplexing: Multiplexing: Frequency-Division Multiplexing, Synchronous Time-Division Multiplexing: Characteristics, TDM Link Control, and Digital Carrier Systems Statistical Time-Division Multiplexing: Characteristics

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Unit-VI

Spread Spectrum and Circuit Switching and Packet Switching: The Concept of Spread Spectrum, Frequency Hopping Spread Spectrum, Direct Sequence Spread Spectrum, Code-Division Multiple Access, Switched Communications Networks, Circuit Switching Networks, Circuit Switching Concepts, and Packet-Switching Principles.

Unit-VII

Asynchronous Transfer Mode: Protocol Architecture, ATM Logical Connections, ATM Cells, Transmission of ATM Cells, ATM Service Categories.

Routing in Switched Networks: Routing in Packet-Switching Networks, Examples: Routing in ARPANET, Least-Cost Algorithms.

Unit-VIII

Modems: Network Attachment and Regulations, Line Conditioning and Leased Lines, Modems and Modem Circuits.

Learning resources

TEXT BOOKS:

1. William Stallings, Data and Computer Communications, 7th Edition, Pearson Education Inc., 2004
2. Mary E.S. Loomis, Data Communications, PHI-N.J.,1983 (Capter 3, Chapter 5)

REFERENCE BOOKS:

1. Behrouz A. Forouzan, Data Communications and Networking, 3rd EditionTMH, 2004
2. William A. Shay, Understanding Data Communications & Networks, 2nd Edition Thomson-Brooks/Cole - Vikas publishing House, 1999
3. Michale A. Miller, Data & Network Communications, Thomson/Delmar - Vikas Publishing House, 2000