(A30475) DATA COMMUNICATIONS
(Open Elective)

B.Tech. ECE

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Unit I: Introduction to data communications, networking, signals, noise, modulation and demodulation. Data communication network architecture, layered network architecture, open systems interconnection, data communications circuits, serial and parallel data transmission, data communications circuit arrangements, data communication networks, alternate protocol suites. Information capacity, bits, bit rate, baud, and M-ARY encoding.

Unit II: Metallic cable transmission media & optical fiber transmission media: metallic transmission lines, transverse electromagnetic waves, characteristics of electromagnetic waves, transmission line classifications, metallic transmission line types, metallic transmission line equivalent circuit, wave propagation on metallic transmission lines, metallic transmission line losses, block diagram of an optical fiber communications system, optical fiber versus metallic cable facilities.

Unit III: Digital transmission & multiplexing and t-carriers digital transmission: pulse modulation, pulse code modulation, dynamic range, signal–to-quantization noise voltage Ratio, linear versus nonlinear PCM codes
Multiplexing: Time- division multiplexing, t1 digital carrier system, north American digital multiplexing hierarchy, digital line encoding, t carrier systems, European digital carrier system, statistical time – division multiplexing, frame synchronization, frequency- division multiplexing, wavelength- division multiplexing, synchronous optical network

Unit IV: Telephone instruments and signals: The subscriber loop, standard telephone set, basic telephone call procedures, call progress tones and signals, cordless telephones, caller id, electronic telephones, paging systems.
The telephone circuit: The local subscriber loop, telephone message-channel noise and noise weighting, units of powers measurement,

transmission parameters and private-line circuits, voice-frequency circuit arrangements, crosstalk.

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Unit V: Data communication codes, bar codes, error control, error detection, error correction, data formats, data communications hardware, character synchronization.

Text Books:

1. Introduction to Data Communications and Networking, Wayne Tomasi,   Pearson   Education.

Reference Books:

1.Data Communications and Networking, Behrouz A Forouzan, Fourth Edition.Tmh.

2. Computer Communications and Networking Technologies, Gallow, Secondedition Thomson

3. Computer Networking and Internet, Fred Halsll, Lingana Gouda Kulkarni, Fifth Edition, Pearson Education

Course Outcomes:

At the end of the course, the student will be able to:

1. Explain the basic concepts of data communication systems.
2. Distinguish various types of transmission medias for data communications.
3. Compare different multiplexing techniques for digital transmission
4. Aanalyze different telephone instruments, signal and circuits
5. Identify different error detecting and correcting codes.