

Course Type	Course Code	Name of the Course	L	T	P	Credits
DE	NECD560	Telemetry and Data Transmission	3	0	0	3

Course Objective

To discuss the fundamentals and applications of telemetry.

Learning Outcomes

- To understand telemetry applications.
- To understand communication system protocols used in telemetry.
- To understand basics of data transmission.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Telemetry system block diagram, Measurement unit, Transmitters and receivers, Antennas, computer networking basics, Data processing, Industrial applications of Telemetry	6	To understand system level block diagram in telemetry
2	Industrial Telemetry: Applications in petroleum, power utility, rail road, mining, manufacturing, municipal water supplies, Fire safety systems, Biomedical, Temperature measurement, fluid level and fluid flow measurement.	6	To understand industrial applications of telemetry.
3	Communication systems: Analog modulation schemes, AM, FM, signal representations, Bandwidth analysis, Noise analysis, Multiplexing, Digital modulation schemes, Antennas and link analysis.	6	To understand basics of communication systems.
4	Source Encoding and Digital signals: Sampling, Line encoding, PCM, DPCM, Delta modulation, common source encoding protocols for audio, video and images. Digital transmission through AWGN channel.	6	To understand digital signaling and encoding methods.
5	Digital Communication: Digital communication systems block diagram, Correlation type demodulator, BER analysis for Binary modulation, M-ary PAM, PSK, DPSK and QAM, Bandpass signal transmission and analysis.	6	To understand design of transmitters and receivers in digital communication systems.
6	Channel Encoding: Communication channel modeling, channel capacity, bounds on communication, coding for reliable communication, linear block codes, cyclic codes and convolutional codes.	6	To understand requirement for channel encoding in data transmission.
7	Computer networking, TCP/IP layers, Data link layer, Network layer, Transport layer and application layer. Data processing software, Industrial protocols RS-232, RS-422, RS-485, PLC and RTU protocols in industrial control systems.	6	To understand basics of computer networking.
Total		42	

Text Books:

1. Proakis, John G., and Masoud Salehi. *Communication system engineering*. Prentice Hall of India Pvt. l, 2023.
2. D. Patranabis, *Telemetry Principles*, Tata McGraw Hill, New Delhi, 1999.

Reference Book:

1. Carden, Frank, Russell P. Jedlicka, and Robert Henry. *Telemetry systems engineering*. Artech House, 2002.