IV B.Tech – I Semester

(20EC7325) Telemetry Systems
(Program Elective-IV)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	0	0	3

Pre-Requisites: Analog and Digital Communications

Course Objectives:

- Understand basics of Telemetry Systems
  Analyze the Frequency and Time Division Multiplexed Systems
- Understand Satellite Telemetry
- Understand Optical Telemetry
- Know the Telecontrol techniques

UNIT I: Telemetry Principles
Introduction, Functional blocks of Telemetry system, Methods of Telemetry –Non-Electrical, Electrical, Pneumatic and Frequency. Signal Type - Analog, Digital, Frequency Spectrum for telemetry application, SYMBOLS AND CODES: Bits and Symbols, Time function pulses, Line and Channel Coding, Modulation Codes. Inter symbol Interference

UNIT II: Multiplexed systems
Frequency Division Multiplex System- FDM, IRIG Standards, FM circuits, Phase Modulation Circuits, Receiving end, Phase Locked Local Loop, Mixers.
Time Division Multiplexed System – TDM -PAM, PAM /PM and TDM –PCM Systems, Digital Multiplexer, PCM Reception, Coding for varying level, DPCM, QAM, WDM, CDM.

UNIT III: Satellite Telemetry:
General considerations, TT & C Service, Digital Transmission systems, TT & C Subsystems, Telemetry, and Communications. **Modern Telemetry:** Zigbee, Ethernet.

UNIT IV: Optical Telemetry and Safety Measures
Fibre optic Cable, Sources and detectors –Transmitter and Receiving Circuits, Optical Fibre components: Types of Switches, Couplers, Splitters, Fibre optic Connectors, Elements of Optical Telemetry Optical fibers, Coherent Optical Fiber Communication System. Safety Measures in Telemetry, Safety barrier (zone), Isolation of signal (Electrical / optical)

UNIT V: Telecontrol Methods

Analog and Digital techniques in Telecontrol, Telecontrol apparatus –Remote adjustment, Guidance, and regulation –Telecontrol using information theory –Example of a Telecontrol System.

Course Outcomes:

After successful completion of the course, the students can be able to

S. No	Course Outcome	BTL
1.	Explain the concept of Basic System, Classification, Non electrical telemetry systems, Voltage and current Telemetry systems, Frequency Telemetering, Power line carrier communication.	L2
2.	Design Phase Locked Local Loop, Mixers. Time Division Multiplexed System – TDM/PAM system.	L4
3.	Understand satellite telemetry principles	L3
4.	Understand optical telemetry principles	L2
5.	Appreciate the application of different telemetry systems and control to any process.	L4

Correlation of COs with POs & PSOs:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	-	-	-	-	-	-	-	-	-	3	-
CO2	2	3	2	-	-	-	-	-	-	-	-	-	2	-
CO3	3	1	1	-	-	-	-	-	-	-	-	-	3	-
CO4	2	2	2	-	-	-	-	-	-	-	-	-	2	-
CO5	3	3	1	-	-	-	-	-	-	-	-	-	3	-

Text Books:

1. Telemetry Principles –D. Patranabis, TMH

2. Telecontrol Methods and Applications of Telemetry and Remote Control –by Swoboda G., Reinhold Publishing Corp., London, 1991

Reference Books:

1. Handbook of Telemetry and Remote Control –by Gruenberg L., McGraw Hill, New York, 1987.

2. Telemetry Engineering –by Young R.E., Little Books Ltd., London, 1988.

3. Data Communication and Teleprocessing System –by Housley T., PH Intl., Englewood Cliffs, New Jersey, 1987.