UEI502 DATA ACQUISITION SYSTEMS

L	**T**	**P**	**Cr**
3	**1**	**0**	**3.5**

Display Systems: Seven Segmental, Dot Matrix, Multiplexed, Code converter, LCD (construction, working and programming Hitachi controller), Plasma and Vapor displays.

Recorders: Galvanometric type, Null type, Potentiometric type, Strip chart and circular chart type, Magnetic tape recorder-principle and operation, Digital tape recorders.

General Telemetric Systems: Land line and RF telemetry, Voltage, Current and Position telemetry with feedback mechanism, RF telemetry, Amplitude modulation, Frequency modulation, Pulse modulation-Pulse amplitude modulation, Pulse code modulation, Wire line and radio channels, Microwave channels, Radio link, Transmitting and Receiving antenna, Telemetry with time and frequency division multiplexing, Telemetry hardware, Band width and Noise reduction (Interference, Grounding, Shielding, Guarding)

Data Transfer Techniques: DMA controller and data transfer in DMA mode, Serial data transmission methods and standards, 4-20 mA current loop, RS 232-C: specifications connection and timing, RS-422, RS-423, GPIB/IEEE-488 standard digital interface, Parallel communication, Centronix port, Communication protocols, Local area networks, Firewire, Universal serial bus, HART protocol, Foundation-Fieldbus, ModBus and other industrial protocols, TCP/IP- Transmission control protocol - Internet protocol, Data compression, Encryption, Error detection and correction techniques, Optical disk storage.

Data Acquisition System (DAS): Single channel and multichannel, Data conversion, Supervisory control and data acquisition system (SCADA), Data acquisition system around microprocessor, microcontroller and PC

COURSE LEARNING OUTCOME (CLO): The student will be able to
1. Understand the concept of various display systems and data acquisition systems.
2. Understand the working of various types of recorders.
3. Understand the modulation and multiplexing techniques used in general telemetric systems.
4. Use various protocols in given data transfer techniques.

Text Books:
1. *Kalsi, H.S., Electronic Instrumentation, Tata McGraw–Hill (2002).*
2. *Mathivanan, N., Microprocessor PC Hardware and Interfacing, Prentice–Hall of India Private Limited (2007).*

Reference Books:
1. *Ananad, M.M.S., Electronic Instruments and Instrumentation Technology, Prentice–Hall of India Private Limited (2004).*
2. *Hall, D.V., Microprocessor and Interfacing, Tata McGraw–Hill (2005).*
3. *Tanenbaum, A.S. , Computer Networks, Prentice–Hall of India Private Limited (2007).*

Evaluation Scheme:

Sr. No.	Evaluation Elements	Weightage (%)
1	MST	30
2	EST	45
3	Sessionals (May include Assignments/Projects/Tutorials/Quizzes/Lab Evaluations)	25