

Course Plan (Jan 2018-June 2018)

Computer Based Instrumentation and Control (EIC-308)

L T P CR
4 0 0 4

Theory	:	60
Class Work	:	40
Total	:	100
Duration of Exam	:	3 Hrs.

Name of the Teacher: Dr.Sheilza Jain

Class/Branch: B.Tech (EIC)

Semester: 6th

Department: Electronics Engineering

Unit No.	Topic to be covered	No. of lectures required	Remarks
UNIT 1: INTRODUCTION	Necessity and function of computers.	2	
	Level of automation: Classical approach and computer based plant automation : On line and Off line.	2	
	Centralized computer control and Distributed computer control.	2	
UNIT 2: INTERFACING	Sampling ,	2	
	Multiplexing, need of multiplexing,	2	
	A/D converter, D/A converters, interfacing of A/D converter and D/A converters with microprocessor/microcomputer,	2	
	programmable communication interface 8251 USART,	3	
	Serial communication and serial communication standards: RS 232, MODEM, Bus arbitration, Current loop.	3	
UNIT 3 : STRUCTURAL STUDY OF AUTOMATIC PROCESS CONTROL:	Fundamentals of automatic process control,	2	
	building blocks of automatic system,	1	
	Distributed control system (DCS) : characteristics, functional levels/ system architecture	1	
	SCADA system	1	
	Direct digital control (DDC): structure, DDC software : position and velocity algorithm,	3	
	Dual computer and basic concept of DDC,	1	
UNIT 4 : PROGRAMMABLE LOGIC CONTROL	Evolution of PLC, Block diagram, PLC selection Process,	2	
	Principle of operation, PLC Scan cycle,Different components of PLC,	1	
	Programming of PLC : Instruction set	4	

	including NO, NC, Set, Reset, Timer, Counter, data transfer, Mathematical and logical functions, LIFO, FIFO, Jump, Bit shift instructions etc.,		
	Application and software of PLCs.	1	
UNIT 5 : MODELING AND SIMULATION FOR PLANT AUTOMATION	Basic concept, need of modeling and simulation,	2	
	building of mathematical model of a plant,	1	
	Modern tools for modeling and simulation.	1	
UNIT 6 : INDUSTRIAL CONTROL APPLICATIONS :	Plant automation: cement plant,	2	
	thermal power plant,	1	
	steel plant and	1	
	water treatment plant.	1	

Recommended Books:

1. Anand, M.M.S., Electronic Instruments and Instrumentation technology, Prentice–Hall of India (2006).
2. Krishna Kant , Computer based industrial Control Prentice Hall of India.(2005)
3. Liptak B.G., Process control: Instrument engineers_ Handbook, Butterwirth Heinemann, (2003) 4th ed.