

GOVERNMENT POLYTECHNIC, PUNE
(An Autonomous Institute of Govt. of Maharashtra)

Programme	:	Diploma in ET/CE/EE//ME/MT/CM/IT/DDGM
Programme Code	:	01/02/03/04/05/06/07/08/21/22/23/24/26/16/17
Name of Course	:	Industrial Automation
Course Code	:	ET 584

Teaching Scheme:

	Hours /Week	Total Hours
Theory	04	64
Practical	02	32

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests, each of 60 minutes	3 Hrs.	3 Hrs.	3 Hrs	--
Marks	20	80	--	25	25

Course Rationale:

This subject is introduced with the view that the students are made familiar with recent trends in industrial automation.

Course Objectives:

After studying this course, the student will be able to

- Understand the control modes.
- Understand the control strategies.
- Understand the PLC architecture, programming, etc.
- Understand the DCS and SCADA systems.

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Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Weight age
SECTION – I			
1.	Introduction		
	Introduction to Closed loop control, Control modes like ON-OFF, Proportional, Integral Derivative, and combinations like PI, PD, and PID. Applications of PID controller. Pneumatic, Hydraulic and Electronic Controllers.	10	12
2.	Advanced Controllers		
	Control strategies: Ratio Control, Lead-Lag control, Cascade Control, Feed-Forward Control. Self tuning controllers, Digital controllers, Concept of Fuzzy Logic controller.	10	12
3.	Programmable Controllers		
	Introduction, definition & History of PLC, Manufacturing & Assembly Processes, PLC Advantages and Disadvantages, Overall PLC System, CPUs & Programmer/Monitors, PLC Input & Output Modules, Printing PLC Information. Applications of PLC	12	16
SECTION – II			
4.	PLC Programming		
	Introduction, Programming Equipments, Programming Formats, PLC Ladder Diagrams, Process Scanning Consideration, Devices to which PLC Input and Output Modules are Connected, Input on/off Switching Devices, Input Analog Devices, Output on/off Devices, Output Analog Devices. PLC Selection Criteria	10	12
5.	Hierarchical & Distributed Control System		
	Concept of Computer aided process control system, Direct digital control, and Distributed control. Overview and Architecture. Operation of Workstations. Subsystems- Data collection subsystem, Process computing subsystem. Telemetry System- Methods of Telemetry, Fiber optic Transmission.	10	14
6.	SCADA		
	Supervisory Control and data Acquisition: Data Acquisition System, Basic Components of SCADA, Functions of Components, Types Communications- Configurations of SCADA, Comparison between DCS and SCADA. Applications of SCADA.	12	14
TOTAL		64	80

List of Practical/Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment
1.	Experiment based on P Controller
2.	Experiment based on combination of P+I Controller
3.	Experiments based on combination of P+I+D Controller
4.	Concept of PID tuning
5.	Basic Ladder programming
6.	Trouble shooting of PLC Based system
7.	Industrial visit for study of DCS
8.	Industrial visit for study of SCADA

Instructional Strategy:



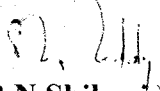
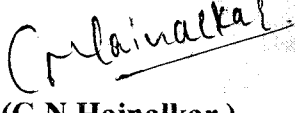
Sr. No.	Topic	Instructional Strategy
1.	Introduction	Classroom teaching & Laboratory work
2.	Advanced Controllers	Classroom teaching & Laboratory work
3.	Programmable Controllers	Classroom teaching & Laboratory work
4.	Hierarchical control system	Classroom teaching & Industrial Visit
5.	Distributed Control System	Classroom teaching & Industrial Visit
6.	SCADA	Classroom teaching & Industrial Visit

Text Books:

Sr. No	Author	Title	Publication
1.	B. G. Liptak	Process Control	
2.	John W Webb & Ronald A Reis	Programming Logic Controllers	PHI

Learning Resources: Reference Books, Manuals and journals

Prepared By :

 (N.L. Janrao.)	 (S.V. Chaudhari.)	 (R.N. Shikari.)
 (G.N. Hainalkar.)		
Lect. In E & TC	Member Secretary, PBOS	Chairman, PBOS