



Certificate Course on Programmable Logic Controller and Industrial Automation

Course Code		Title of the Course	Programmable Logic Controller and Industrial Automation
Total Credits of the Course	4	Hours per Week	4 Hours

Course Objectives:	<ol style="list-style-type: none">1. Demonstrate knowledge of programmable logic controllers.2. Demonstrate knowledge of process control systems.3. To learn Programs using ladder logic programming of software.4. To design PLC based system for process control.5. Use of Digital and Analog I/O.6. To Understand various timers, counters, fault and interrupt systems.7. Define and Develop a PLC based process control system, its software/hardware design.
--------------------	--

Course Content		
Unit	Description	Weightage* (%)
1.	Introduction to Programmable Logic Controllers (PLCs) and its architecture, Ladder Basics, Understanding Electrical Ladder Drawings and components of Ladder diagram, PLCs and Processing I/O, Programming the Application, Control Task Basic, Basic Memory Circuits	20
2.	Timers & Counters, T/C Examples and Applications, Races using Timer-Counter, Math Functions, Planning the Panel, Sensors, Safety, Analog module Programming and Troubleshooting	20
3.	Use of State Diagrams, Handling Data, Indexing – Batching Applications, Object Oriented Programming, Human Machine Interface, Networks and Protocols, Programming and Communication	20





	with PLC, Drives Programming and Interfacing	
4.	Motion, Mechanical Conversions & Moving a device, Motion Control Products, Planning Tasks, Programming the PID Algorithm, Safety Programming in the PLC, Artificial Intelligence	20
5.	LIST OF PRACTICALS : 1. Practical Aspects of Various Sensors and Modules 2. Assembling of different Modules and Components 3. Prepare and Execute Ladder Diagram for Various Arithmetic and Logical Operations 4. Prepare and Execute Ladder Diagram for Various Logical Conditions of Timer & Counter 5. Ladder Diagram for various Industrial Process & Control Viz. Temperature, Level, Flow etc. 6. HMI Interfacing	20
Teaching-Learning Methodology	Use of ICT Tools, Classroom Teaching and Lab. Experiments (Offline), Use of Power Point Presentation, Tutorial Problem Solving, Assignments, Group Discussion, Video Animation and Presentation, Experimental demonstration, Industry visit / Training .	

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination	20%
2.	Internal Continuous Assessment in the form of Viva-voce, Quizzes, Seminars, Assignments, Attendance	10%
3.	University Examination	70%





Course Outcomes: Having completed this course, the learner will be able to

1. Identify components of a PLC and describe their functions.
2. Create, edit, download, and run PLC programs.
3. Monitor variable values in real time in program execution.
4. Interpret ladder logic programs.
5. Effectively write PLC programs.
6. Perform debugging of programs.
7. Provide proper documentation for programs.

Suggested References:

Sr. No.	References
1.	Programmable Logic Controllers: Principles And Applications, 5Th Edition By: Webb/Reis
2.	Programmable Logic Controllers and Industrial Automation: An Introduction by Madhuchhanda Mitra, Samarjit engupta et.all
3.	Programmable Logic Controllers By : Frank Petruzella
4.	Programmable Logic Controllers By : Programming Methods and Applications By: Hackworth

