

# GUJARAT TECHNOLOGICAL UNIVERSITY

## B.E. SEMESTER : VIII

### MECHATRONICS ENGINEERING

Subject Name: **PROGRAMMABLE LOGIC CONTROLLERS**

Sr. No.	Course Contents	Total Hrs
1.	<b>Introduction to Programmable logic controllers:</b> Logic Controllers, Hardware of PLC, Internal architecture, PLC systems	3
2.	<b>Input/output Processing:</b> Input/output units , Signal conditioning, Remote connections, Networks, Processing inputs, I/O addresses	5
3.	<b>Ladder &amp; Functional Block Programming and Internal Relays:</b> Ladder diagrams, Logic functions, Latching, Multiple outputs, Entering programs, Function blocks, Program examples	6
4.	<b>IL, SFC and ST programming methods:</b> Instruction lists, Sequential function charts, Structured text, Program examples	4
5.	<b>Jump and call , Timers and Counters:</b> Jump Instructions, Subroutines, Types of timers, Programming timers, On-delay timers, Off-delay timers, Pulse timers, Retentive on delay times, Forms of counter, Programming Up and down counting, Timers with counters, Sequencer, Programming examples	6
6.	<b>Shift registers and Data handling:</b> Shift registers, Ladder programs, Registers and bits, Data handling, Arithmetic functions, Closed loop control, Programming examples	3
7.	<b>Designing systems:</b> Program development, Safe systems, commissioning, Fault finding, System documentation	3
8.	<b>Industrial Programs:</b> Temperature control, Valve sequencing, Conveyor belt control, Control of a process	6

#### List of Experiments:

- 1 Tank level control by using PLC.
- 2 To control Conveyor belt operation using PLC.
- 3 Traffic light control using PLC.
- 4 DOL starter & star delta starter operation by using PLC.
- 5 Lift Control simulation using PLC.
- 6 Process control in paint industry using PLC.
- 7 To control the operation of drill machine using PLC.
- 8 Alarm annunciation using PLC.
- 9 To control the operation two conveyor belt using PLC.
- 10 Analog input/output simulation using PLC.

#### Text Books:

- 1 W. Bolton , “Programmable Logic Controllers”, 4th Edition by, Newnes/ ELSEVIER Publication.

#### References Books:

- 1 Jhon W Webb, Ronald A Reis, “Programmable Logic Controllers, Principles and Applicaiotns” Prentice Hall of India Pvt. Ltd.
- 2 John R. Hackworth, Frederick D., Hackworth Jr., “Programmable Logic Controllers Programming Methods and Applications”
- 3 LOGO Manual and S7-300 Manual of Siemens for Instructions