

PROGRAMMABLE LOGIC CONTROLLERS

Course Code	23EE4701B	Year	IV	Semester	I
Course Category	Professional Elective-IV	Branch	EEE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Digital Circuits
Continuous Internal Evaluation:	30	Semester End Evaluation:	70	Total Marks:	100

Course Outcomes	
Upon successful completion of the course, the student will be able to	
CO1	Understanding concepts on PLC basics, programming, PLC functions analog PLC operation. (L2)
CO2	Apply PLC programming concepts to develop ladder diagrams using input/output instructions, Boolean logic, and sequence control for industrial applications. (L3)
CO3	Analyze timers, counters, registers, and PLC and data handling functions.(L3)
CO4	Analyze analog operations and PID control in PLC.(L4)

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:High, 2: Medium, 1:Low)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2	2			2							1	1
C02	3	2	2		3							3	2
CO3	2	3	2		3							3	2
CO4	2	2	2		3							3	2

SYLLABUS		
Unit No.	Contents	Mapped CO
I	PLC Basics PLC Advantages and disadvantages – Overall PLC system – Central Processing Unit - I/O modules Power supplies- programming Equipment - programming formats - construction of PLC ladder diagrams – Input On/Off Switching Devices – Input Analog Devices - Output On/Off Switching Devices – Output Analog Devices.	CO1 CO2
II	PLC Programming PLC Input instructions - outputs - operational procedures - programming examples using contacts and coils - Drill press operation. Digital logic gates - Boolean algebra PLC programming - conversion examples- Ladder diagrams and sequence listings - ladder diagram construction and flowchart	CO1 CO2

	for spray process system.	
III	Basic and Intermediate PLC Functions General Characteristics of Registers - module addressing - holding registers - Input Registers - Output Registers. PLC Timer functions & Industrial applications - counters - counter function industrial applications - Arithmetic functions - Number comparison functions - number conversion functions.	CO1 CO2 CO3
IV	Data Handling functions SKIP - Master control Relay - Jump - Move - FIFO - FAL - ONS - CLR & Sweep functions and their applications. Bit Pattern and changing a bit shift register - sequence functions and applications - controlling of two-axis & three axis Robots with PLC - Matrix functions.	CO1 CO3
V	Analog PLC operation Analog modules & systems - Analog signal processing - Multi bit Data Processing - Analog output Application Examples - PID principles - position indicator with PID control - PID Modules - PID tuning - PID functions.	CO1 CO4

Learning Resources	
Text Books:	
1. Programmable Logic Controllers- Principles and Applications by John W. Webb & Ronald A. Reiss - Fifth Edition - PHI 2. Programmable Logic Controllers- Programming Method and Applications –JR.Hackworth &F.D Hackworth Jr. –Pearson - 2004	
Reference Books:	
1. Introduction to Programmable Logic Controllers- Gary A. Dunning - 3rd edition - Cengage Learning - 2005. 2. Programmable Logic Controllers –W.Bolton - 5th Edition - Elsevier publisher - 2009.	
E-Resources:	
1. https://nptel.ac.in/courses/108105062 2. https://nptel.ac.in/courses/108105063	