PROGRAMMABLE LOGIC CONTROLLERS
(Elective-I)

Course Code:13EE1120

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Prerequisites: This course requires knowledge of operation of relays, contactors.

Course Outcomes:

At the end of the course, student will be able to:

CO 1 Describe the PLC and how to construct PLC ladder diagrams.

CO 2 Explain an application with programming.

CO 3 Describe characteristics of registers and conversion examples.

CO 4 Apply PLC functions to timing and counting applications.

CO 5 Analyze the analog operation of PLC and demonstrate the robot applications with PLC.

UNIT-I **(12 Lectures)**

PLC BASICS:

PLC system, I/O modules and interfacing, CPU processor, programming Equipment, Programming formats, construction of PLC ladder diagrams, Devices connected to I/O modules.

UNIT-II **(12 Lectures)**

PLC PROGRAMMING:

Input instructions, outputs, operational procedures, programming examples using contacts and coils. Drill press operation

UNIT-III **(12 Lectures)**

Digital logic gates, programming in the Boolean algebra system, conversion examples Ladder Diagrams for process control: Ladder diagrams & sequence listings, ladder diagram construction and

flowchart for spray process system.

PLC Registers: Characteristics of Registers, module addressing, holding registers, Input Registers, Output Registers.

UNIT-IV (12 Lectures)

PLC FUNCTIONS:

Timer functions & Industrial applications, counters, counter function industrial applications, Arithmetic functions, Number comparison functions, number conversion functions.

Data Handling functions: SKIP, Master control Relay, Jump, Move, FIFO, FAL, ONS, CLR & Sweep functions and their applications

UNIT-V (12 Lectures)

Bit Pattern and changing a bit shift register, sequence functions and applications, controlling of two-axis & three axis Robots with PLC, Matrix functions.

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.

TEXT BOOKS:

1. John W. Webb & Ronald A.Reiss, "*Programmable Logic Controllers-Principles and Applications*", Fifth Edition, PHI, 2009.

REFERENCES:

1. Jr. Hackworth & F.D Hackworth Jr., *"Programmable Logic Controllers- Programming Method and Applications"*, Pearson, 2003.
2. Gary Dunning, *"Introduction to Programmable Logic Controllers"*, Delmar Thomas Learning,3rd Edition,2005.