I Year I Semester | **L P C**

Code: 17PE133 | **4 0 3**

PROGAMMABLE LOGIC CONTROLLERS & APPLICATIONS
(Common to PE, P&ID, PE&ED, PE&D, PE&S, EM&D, PE&PS)
(Elective I)

Prerequisites: Knowledge on relay logic and digital electronics. Course Educational

Objectives:

1. To have knowledge on PLC.
2. To acquire the knowledge on programming of PLC.
3. To understand different PLC registers and their description.
4. To have knowledge on data handling functions of PLC.
5. To know how to handle analog signal and converting of A/D in PLC.

UNIT 1: 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 2: PLC Programming:

Input instructions, outputs, operational procedures, programming examples using contacts and coils. Drill press operation. Digital logic gates, programming in the Boolean algebra system, conversion examples. Ladder diagrams for process control: Ladder diagrams and sequence listings, ladder diagram construction and flow chart for spray process system.

UNIT 3: PLC Registers:

Characteristics of Registers, module addressing, holding registers, input registers, output registers. PLC Functions: Timer functions and Industrial applications, counters, counter function industrial applications, Arithmetic functions, Number comparison functions, number conversion functions.

UNIT 4: Data Handling functions:

SKIP, Master control Relay, Jump, Move, FIFO, FAL, ONS, CLR and Sweep functions and their applications. Bit Pattern and changing a bit shift register, sequence functions and applications, controlling of two axis and three axis Robots with PLC, Matrix functions.

UNIT 5: Analog PLC operation:

Analog modules and 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.

Course Outcomes:

After completion of this course the students will be able to:
• Understand the PLCs and their I/O modules.
• Develop control algorithms to PLC using ladder logic etc.
• Manage PLC registers for effective utilization in different applications.
• Handle data functions and control of two axis and their axis robots with PLC.
• Design PID controller with PLC.

Reference Books:

1. Programmable Logic Controllers – Principle and Applications by John W. Webb and Ronald A. Reiss, Fifth Edition, PHI
2. Programmable Logic Controllers – Programming Method and Applications by JR. Hackworth and F.D Hackworth Jr. – Pearson, 2004.
3. Introduction to Programmable Logic Controllers- Gary Dunning-Cengage Learning.
4. Programmable Logic Controllers –W.Bolton-Elsevier publisher.