Year Semester: III Year II Semester **L T P C**

Code: 20EE6203 **1 0 2 2**

PLC/SCADA LABORATORY

Preamble: The primary objective of the PLC lab is to familiarize students with how signals from input devices (i.e. switches, sensors, etc.) can interface with PLC units in order to invoke certain actions (i.e. start/stop an electric motor, turn on a light, etc.). A PLC functions similar to your computer. A computer processes input (i.e. keyboard entries, sounds from microphones, etc.) and invokes a certain output (i.e. showing the letter you typed on the screen, sending a request through the internet, etc.). Similarly, PLC unit processes input and invokes output, but the inputs to a PLC unit are usually devices such as sensors, buttons, switches, etc. The outputs are usually signalling to start/stop motors, turn on/off lights, sound a horn, etc. The main objective of the SCADA lab is to understand SCADA architecture and communication protocols. It also helps in understanding the working of SCADA system by conducting various experiments to learn the basic operations of SCADA.

Course Objectives: students are supposed

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

Course Outcomes: At the end of the course, the students can able

1. Understand the PLCs and their I/O modules.
2. Manage PLC registers for effective utilization in different applications.
3. Develop control algorithms to PLC using ladder logic.
4. Understand the handling of Analog signals and converting of A/D in PLC.
5. Understand the basic of SCADA configuration.

CO – PO & CO – PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	2	2	-	-	-	-	1	1	-	-	2	-	-
CO2	1	1	2	2	-	-	-	-	1	1	-	-	2	-	-
CO3	1	1	2	2	-	-	-	-	1	1	-	-	2	-	-
CO4	1	1	2	2	-	-	-	-	1	1	-	-	2	-	-
CO5	-	-	2	2	-	-	-	-	1	1	-	-	2	-	-

*1 – Weak, 2 – Moderate and 3 – Strong

S.No **List of Experiments**

1. Interfacing of lamp and Push button with PLC for ON/OFF operation.
2. Controlling the Lamp output using basic Logic Gates.
3. Controlling a Motor using PLC Ladder program.
4. Combination of counter & timer for Bulb ON/OFF operations.
5. Traffic Signal Light Control using Timers.
6. PLC based temperature sensing using RTD.
7. Industrial Process Fan Control.
8. PLC interfaced with SCADA and status read/command transfer operation.
9. Parameter reading of PLC in SCADA.
10. Alarm malfunction using SCADA.
11. Reporting and Trending in SCADA system.

Text Books:

1. Programmable logic controllers by Frank D.Petruzella- McGraw Hill – 3rd Edition.
2. Programmable Logic Controllers – Principle and Applications by John W. Webb and Ronald A. Reiss, Fifth Edition, PHI

Reference Books:

1. Programmable Logic Controllers – Programming Method and Applications by JR. Hackworth and F.D Hackworth Jr. – Pearson, 2004.
2. Introduction to Programmable Logic Controllers- Gary Dunning-Cengage Learning.
3. Programmable Logic Controllers –W.Bolton-Elsevier publisher