



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad– 500043

Electrical and Electronics Engineering

List of Laboratory Experiments

PLC AND INDUSTRIAL AUTOMATION LABORATORY								
CourseCode	Category	Hours/Week			Credits	MaximumMarks		
AEEEC32	Core	L	T	P	C	CIA	SEE	Total
		0	0	3	1.5	30	70	100
Contact Classes: 15	Tutorial Classes: Nil	Practical Classes: 36			Total Classes: 51			
Branch: EEE	Semester: VI	Academic Year: 2023-24			Regulation:UG20			
<p>Course Overview: The objective of this laboratory course is to measure the physical input variables and to analyze and control and output variables in an industrial automation process using programmable logic controllers (PLCs). The lab emphasizes on the software and hardware skills to design and realize an automation process. The lab is mainly intended to implement the software timers, counters and their usage in traffic signal control, sequential control, speed control of motors etc.</p>								
<p>Course Objectives: The students will try to learn: Students will try to learn:</p> <ol style="list-style-type: none"> The operation of PLCs, its ladder diagram programming and wiring of hardware equipment with PLC. The measurement and control of digital, analog input/output variables using PLC. The use of Human Machine Interface (HMI) to monitor and control the operation of a process. 								
<p>Course Outcomes: After successful completion of the course, student should be able to:</p> <p>CO 1: Use of the PLC logic gates, timers and Counters for delaying a particular control process and counting the production rate in an industrial system.</p> <p>CO 2: Design a system for starting, speed control and braking of DC/AC motors using PLC digital module.</p> <p>CO 3: Measure the temperature, speed, voltage and current using PLC analog module to control the operation of motors, relays and circuit breakers.</p> <p>CO 4: Construct the PLC based automatic traffic signal system to control the vehicle congestion at a three-way or four-way road junction.</p> <p>CO 5: Develop the ladder diagram logic programs for lift control, water level monitoring and fault annunciation systems.</p>								
WEEK NO	EXPERIMENTNAME							CO
WEEK-I	LOGIC GATES							CO1
	Implementation of logic gates using programmable logic controller.							
WEEK-II	TIMERS							CO1
	Implementation of software timers in programmable logic controller.							

WEEK-III	COUNTERS	CO1
	Implementation of software counters in programmable logic controller.	
WEEK-IV	SEQUENTIAL CONTROL	CO2
	Starting of three motors sequentially with some time delay using programmable logic controller.	
WEEK-V	DIRECT ONLINE (DOL) AND STAR DELTA STARTERS	CO2
	Design of direct online (DOL) and star-delta starters for three phase induction motor using PLC.	
WEEK-VI	AUTOMATIC FORWARD AND REVERSE CONTROL OF MOTOR	CO3
	Automatic forward and reverse control of three phase squirrel cage induction motor for milling operation using programmable logic controller.	
WEEK-VII	REVERSE CURRENT BREAKING OF THREE PHASE INDUCTION MOTOR	CO2
	Implementation of reverse current braking method for three phase induction motor using PLC.	
WEEK-VIII	SPEED CONTROL OF DC MOTOR	CO3
	Implementation of field control and armature control methods of speed control for DC motor using PLC.	
WEEK-IX	WATER LEVEL MONITORING AND CONTROL	CO5
	Development of automatic water level monitoring system for an overhead tank using PLC.	
WEEK-X	TRAFFIC SIGNAL CONTROL	CO4
	Design of a traffic signal control system for a 3- way junction road using PLC.	
WEEK-XI	TEMPERATURE CONTROL IN A ROOM	CO3
	Design a temperature control system to monitor the temperature of a room using PLC.	
WEEK-XII	OVER VOLTAGE AND UNDER VOLTAGE PROTECTION	CO3
	Design of over voltage and under voltage protection system for home appliance using PLC.	