

COURSE CODE: 1152EE130	COURSE TITLE: <b>PROCESS AUTOMATION</b>	L	T	P	C
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**COURSE CATEGORY:**

Program Elective

**PREAMBLE :**

This course is designed to provide the knowledge on recent trends in automation techniques (Programmable Logic Controllers & Distributed Control Systems deployed in the various core industries and research organization.

**PREREQUISITE COURSES:**

- Digital Logic Circuits

**COURSE EDUCATIONAL OBJECTIVES:**

The objectives of the course are to make the students,

- Realize the working, design and need of timers, counters, various memories and their efficient managing techniques.
- Relate the automation techniques to real world engineering applications.

**COURSE OUTCOMES :**

Upon the successful completion of the course, students will be able to:

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Illustrate the basics of PLCs	K2
CO2	Design Ladder Diagram by programming the timers and counters.	K3
CO3	Design the PLCs addressing applications and research problems.	K3
CO4	Exemplify the basics and design of DCS	K3
CO5	Integrating various components to DCS to execute Automation	K2

**CORRELATION OF COs AND POs**

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		L	M	M	M							
CO2		H	M	H		M		L				
CO3		L	L	M		L		M		L		
CO4		L	M	M	M							
CO5	L		L			M				M		

**COURSE CONTENT:**

<b>UNIT I</b>	<b>PROGRAMMABLE LOGIC CONTROLLER</b>	<b>9</b>
Evolution of PLC's – Components of PLC – Advantages over relay logic - PLC programming languages		

<b>UNIT II</b>	<b>PROGRAMING IN PLC</b>	<b>9</b>
Ladder diagram – Programming timers and counters – Design of PLC.		
<b>UNIT III</b>	<b>APPLICATIONS OF PLC</b>	<b>9</b>
Instructions in PLC – Program control instructions, math instructions, sequencer instructions – Use of PC as PLC – Application of PLC – Case study of bottle filling system		
<b>UNIT IV</b>	<b>DISTRIBUTED CONTROL SYSTEMS (DCS)</b>	<b>9</b>
Definition, architecture (centralized, hybrid generalized DCS) Local Control Unit (LCU) architecture, LCU languages, LCU – Process interfacing issues, communication facilities, configuration of DCS.		
<b>UNIT V</b>	<b>INTERFACES IN DCS</b>	<b>9</b>
Operator interfaces - Low level and high level operator interfaces – Operator displays - Engineering interfaces – Low level and high level engineering interfaces – General purpose computers in DCS.		
<b>TOTAL: 45 PERIODS</b>		
<b>TEXT BOOKS:</b>		
1. Programmable Logic Controllers, 3rd Edition, by Frank Petruzella, Tata Mc Grawhill publications.		
<b>REFERENCE BOOKS:</b>		
1. Programmable Logic Controllers, 5th Edition, by George Bolton, Elsevier India publications.		
2. Programmable Logic Controllers, by Webb John W, Reis Ronald A, PHI learning pvt ltd.		
3. Programmable Logic Controllers: Programming methods and Applications 1st Edition by Hackworth, Pearson India Publications.		