

COURSE CODE: 1153EE104	COURSE TITLE: INTRODUCTION TO AUTOMATION	L	T	P	C
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COURSE CATEGORY:

Allied 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

RELATED COURSES:

- Power System Operation & Control, Embedded Control of Electric Drives, Utilization of Electrical Energy, Virtual Instrumentation

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
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:

UNIT I	PROGRAMMABLE LOGIC CONTROLLER	9
Evolution of PLC's – Components of PLC – Advantages over relay logic - PLC programming languages		
UNIT II	PROGRAMING IN PLC	9

Ladder diagram – Programming timers and counters – Design of PLC.		
UNIT III	APPLICATIONS OF PLC	9
Instructions in PLC – Program control instructions, math instructions, sequencer instructions – Use of PC as PLC – Application of PLC – Case study of bottle filling system		
UNIT IV	DISTRIBUTED CONTROL SYSTEMS (DCS)	9
Definition, architecture (centralized, hybrid generalized DCS) Local Control Unit (LCU) architecture, LCU languages, LCU – Process interfacing issues, communication facilities, configuration of DCS.		
UNIT V	INTERFACES IN DCS	9
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.		
TOTAL: 45 PERIODS		
TEXT BOOKS:		
1. Programmable Logic Controllers, 3rd Edition, by Frank Petruzella, Tata Mc Grawhill publications.		
REFERENCE BOOKS:		
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		