

<b>Course Number and Name</b>												
BEI701 - Logic and Distributed Control System												
<b>Credits and Contact Hours</b>												
3 and 45												
<b>Course Coordinator's Name</b>												
Ms B.Kalaiselvi												
<b>Text Books and References</b>												
<b>TEXT BOOKS:</b>												
1. F.D. Petruzella, Programmable Logic Controllers, Tata Mc-Graw Hill, Third edition, 2010												
2. Michael P. Lukas, Distributed Control Systems: Their Evaluation and Design, Van Nostrand Reinhold Co., 1986												
3. D. Popovic and V.P.Bhatkar,' Distributed computer control for industrial Automation' Marcel Dekker, Inc., Newyork, 1990.												
<b>REFERENCES:</b>												
1. T.A. Hughes, Programmable Controllers, Fourth edition, ISA press, 2005												
2. Krishna Kant, Computer Based Industrial Control, Second edition, Prentice Hall of India, New Delhi, 2010.												
3. John W. Webb and Ronald A. Reis, 'Programmable Logic Controllers, Fifth edition, Prentice Hall of India, New Delhi, 2010.												
4. John R. Hackworth and Frederick D. Hackworth Jr, Programmable Logic Controllers, Pearson, New Delhi, 2004.												
5. Clarke, G., Reynders, D. and Wright, E., "Practical Modern SCADA Protocols: DNP3,4. 60870.5 and Related Systems", Newnes, 1st Edition, 2004.												
6. E.A.Parr, Programmable Controllers, An Engineer's Guide, Elsevier, 2013.												
<b>Course Description</b>												
<ul style="list-style-type: none"><li>To give an introductory knowledge on Programmable Logic Controller (PLC) and their Programming languages</li><li>To give adequate knowledge about applications of PLC</li><li>To give basic knowledge about Computer Controlled Systems</li><li>To give basic knowledge on the architecture and local control unit of Distributed Control System(DCS)</li><li>To give adequate information with respect to interfaces used in DCS</li></ul>												
<b>Prerequisites</b>						<b>Co-requisites</b>						
Control System						NIL						
required, elective, or selected elective (as per Table 5-1)												
Selected Elective												
<b>Course Outcomes (COs)</b>												
CO1: To get an introductory knowledge on PLC and Programming Languages												
CO2: To get Adequate knowledge about application of PLC												
CO3: To get basic knowledge about computer controlled systems												
CO4: To get basic knowledge on the architecture and local control unit of Distributed Control												
CO5: To get an adequate knowledge application of PLC												
CO6:To understand the systems used in distributed control systems												
Student Outcomes (SOs) from Criterion 3 covered by this Course												
	COs/SOs	a	b	c	d	e	f	g	h	i	j	k
	CO1	M	M	M	H	M		M			L	L
	CO2	H	M	M	H	H		M			L	L
	CO3	H	M		H	H		M			L	L

	CO4	H	M		H	H		M			L	L	
	CO5	H	M	M	H	H		M			L	L	
	CO6	H			H	H		M			L	L	

### List of Topics Covered

#### UNIT-I PROGRAMMABLE LOGIC CONTROLLER

9

Evolution of PLCs – Components of PLC – Architecture of PLC – Discrete and analog I/O modules – Programming languages -Ladder diagram – Function block diagram (FBD) - Programming timers and counters

#### UNIT-II APPLICATIONS OF PLC

9

Instructions in PLC – Program control instructions, math instructions, data manipulation Instructions, sequencer and shift register instructions – Case studies in PLC

#### UNIT-III COMPUTER CONTROLLED SYSTEMS

9

Basic building blocks of computer controlled systems – Data acquisition system – Supervisory control – Direct digital control- SCADA: - Hardware and software, Remote terminal units, Master Station and Communication architectures.

#### UNIT-IV DISTRIBUTED CONTROL SYSTEM

9

DCS – Various Architectures – Comparison – Local control unit – Process interfacing issues – Communication facilities

#### UNIT V INTERFACES IN DCS

9

Operator interfaces - Low level and high level operator interfaces – Displays - Engineering interfaces – Low level and high level engineering interfaces – Factors to be considered in selecting DCS – Case studies in DCS