SWARNANDHRA
COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada
Seetharampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

DEPARTMENT OF MECHANICAL ENGINEERING & ROBOTICS

TEACHING PLAN

Course Code	Course Title	Semester	Branch	Contact Periods /Week	Academic Year	Date of commencement of Semester
20RB6T02	PROGRAMMABLE LOGIC CONTROLLERS (R20)	VI	ROBOTICS	6	2024-25	18/11/2024

COURSE OUTCOMES

1	Identify and understand the automation concepts for industries.[K2]
2	Apply PLC architecture knowledge to select PLC for specific problems.[K3]
3	Use PLC Ladder diagram for simple applications.[K3]
4	Apply real time application using PLC.[K3]
5	Develop prototype for the real time application using PLC, with HMI. [K3]

UNIT	Out Comes / Bloom's Level	Topics No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
I	Identify and understand the automation concepts for industries [K2]	**Unit-1 INTRODUCTION TO FACTORY AUTOMATION**				
		1.1	History and developments in industrial automation	T1, R1	2	Chalk and talk /ppt
		1.2	Vertical integration of industrial automation	T1, R1	2	
		1.3	Control elements in industrial automation	T1, R1	1	
		1.4	PLC introduction	T1, R1	2	
Content beyond Syllabus			Simulation of FMS system		1	
				Total	8	
II	Apply PLC architecture knowledge to select PLC for specific problems. [K3]	**Unit-2. PROGRAMMABLE LOGIC CONTROLLERS**				
		2.1	Basics of PLC, advantages, capabilities of plc	T1	1	Chalk and talk /ppt
		2.2	architecture of PLC, scan cycle, types of PLC	T1	1	
		2.3	types of I/O modules	T1	2	
		2.4	power supplies and isolators	T1	1	
		2.5	configuring a PLC	T1	1	
		2.6	PLC wiring	T1	1	

Content beyond Syllabus			basics of using plc simulator		1	
				Total	**9**	
		Unit-3. PROGRAMMING OF PLC				
III	Use PLC Ladder diagram for simple applications. [K3]	3.1	General PLC programming	R1,T1	1	Chalk and talk /ppt/ /quiz
		3.2	Procedures and types of programming, programming on-off inputs/outputs simple process control programs using relay ladder logic	T1, T2	3	
		3.3	auxiliary commands and functions of plc	T1, T2	1	
		3.4	PLC basic functions	T1, T2	1	
			register basics and timer of plc	T1, T2	2	
		3.4	counter functions of plc	R1,T1	2	
Content beyond Syllabus			simulation of counter and timers in software		1	
				Total	**11**	
		Unit-4. PLC INTERMEDIATE FUNCTIONS				
IV	Apply real time application using PLC. [K3]	4.1	Arithmetic functions, Comparison functions	T1, T2	1	Chalk and talk /ppt/ /quiz
		4.2	Skip and MCR functions	T1, T2	2	
		4.3	Data move systems	T1, T2	1	
		4.4	PLC advanced intermediate functions utilizing digital bits, sequencer functions, matrix functions	T1, T2	3	
		4.5	PLC advanced functions	T1, T2	2	
		4.6	alternate programming languages, analog PLC operation.	T1, T2	2	
Content beyond Syllabus			Designing systems of plc		1	
				Total	**12**	
		Unit 5. HMI SYSTEMS				
V	Develop prototype for the real time application using PLC, withHMI .[K3]	5.1	Necessity and role in industrial automation	T1, R1	1	Chalk and talk /ppt
		5.2	Text display, Operator panels, touch panels, panel PCs	T1, R1	2	
		5.3	Integrated displays	T1, R1	1	
		5.4	Interfacing PLC to HMI	T1, R1	2	
Content beyond Syllabus			Multiple man-machine interfaces		1	
				Total	7	
				CUMULATIVE PROPOSED PERIODS	47	

Text Books:	
S.No.	**AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION**
1	Frank D Petruzella, "Programmable Logic Controllers ", 5th Edition, McGraw-Hill Education, 2016.
2	William Bolton, "Programmable Logic Controllers ", 6th Edition, McGraw-Hill Education, 2016.
Reference Books:	
S.No.	**AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION**
1	Dag H. Hanssen, "Programmable Logic Controllers ", 1st Edition, Wiley Publisher, 2015.
2	Khalid Kamel, Eman Kamel, "Programmable Logic Controllers", McGraw-Hill Professional Publishing, 2013
Web Details	
1	https://plc-coep.vlabs.ac.in/exp/up-down-counter/simulation/index.html
2	https://www.plcacademy.com/
3	https://www.youtube.com

		Name	Signature with Date
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Principal