	ANNA UNIVERSITY MADRAS INSTITUTE OF TECHNOLOGY CAMPUS CHROMEPET, CHENNAI – 600 044 DEPARTMENT OF PRODUCTION TECHNOLOGY	Year: Jan 24 – May 24 Sem.: (2/4)

COURSE PLAN WITH METHOD OF EVALUATION / RUBRICS

Name of the Faculty and Designation	**Dr. C. Arun Prakash, Assistant Professor**		
Name of the programme	M.E.	Branch	Mechatronics
Regulation	R2023	No. of students	18
Subject Code & Name	**MR3202 Industrial Automation**		

Unit No.	Unit title	Course Outcomes	Time period	Material Reference
1.	Introduction and Need for Automation	CO1, CO2	1	Patranabis. D, "Principles of Industrial Instrumentation", Tata McGraw-Hill Publishing Ltd.2nd edition, 2016.
2.	Instrumentation System for Measurement of Process Parameters		1	
3.	Flow, Level measurements		1	
4.	Pressure measurement		1	
5.	Temperature and Speed measurements		1	
6.	Current and Voltage Measurements – Proximity and Vision Based Inspection Systems – Process Control Systems – Con		1	
7.	Proximity and Vision Based Inspection Systems		1	
8.	Process Control Systems – Continuous and Batch Process		1	
9.	Feedback Control System Overview		1	
10.	Fundamentals of Programmable Logic Controller - Functions of PLCs	CO2, CO3	1	Frank D, Petruzella, "Programmable Logic Controller" McGraw – Hill Publications, 2016
11.	Features of PLC - Selection of PLC		1	
12.	Architecture of PLC		1	
13.	Basics of PLC Programming		1	
14.	Logic Ladder Diagrams – Communication in PLC		1	
15.	Programming Timers		1	
16.	Counters		1	
17.	Data Handling		1	
18.	PLC modules - Advanced PLC.		1	

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19.	Industrial Data Communications - Fiber Optics	CO1, CO2, CO4	1	Lucas, M.P., "Distributed Control System", Van Nastrand Reinhold Company, 1986. Mackay S., Wrijut E., Reynders D. and Park J., "Practical Industrial Data Networks Design, Installation and Troubleshooting", Newnes Publication - Elsevier, 2004.
20.	Modbus – HART – DeviceNet		1	
21.	Profibus – Fieldbus		1	
22.	– Introduction to Supervisory Control Systems, SCADA		1	
23.	Distributed Control System (DCS)		1	
24.	Safety Systems		1	
25.	Man-Machine Interfaces		1	
26.	Total Integrated Automation (TIA)		1	
27.	Review of Unit III		1	
28.	Factory Layout	CO2, CO4, CO5	1	Shengwei Wang, "Intelligent Buildings and Building Automation", Routledge Publishers, 2009.
29.	Tools and Software Based Factory Modelling		1	
30.	Case study – Automated Manufacturing Units		1	
31.	Case study – Assembly Units		1	
32.	Case study – Inspection Units		1	
33.	PLC Based Automated Systems		1	
34.	Introduction to Factory Automation Monitoring Software		1	
35.	Building Automation System-Software		1	
36.	Review of Unit 4		1	
37.	Industry 4.0-Overview	CO1, CO2	1	
38.	Challenges in Industry 4.0		1	

39.	Big Data-Characteristics of Big Data		1	
40.	Artificial Intelligence		1	
41.	Machine to Machine Technologies		1	
42.	IoT		1	
43.	Digitization		1	
44.	Digital Twin		1	
45.	Review of Unit 5		1	

LIST OF EXPERIMENTS

1. Experiments on Ladder Logic Program for Various Logic Gates AND, OR, NOT, NOR, NAND, EX-OR and EX-NOR.
2. Implement Various Mathematical Functions in PLC Using Ladder Diagram Programming Language.
3. Develop Ladder Diagram Programming to set Timer and Counter in PLC.
4. Develop PLC Program to Control Traffic Light.
5. Develop PLC Program to Maintain the Pressure and Level in a Bottle Filling System.
6. Develop Ladder Diagram Program in PLC for Material Filling and Material Handling
7. Develop Ladder Diagram Program in PLC for Object Shorting, Orientation Check and Material Property Check.
8. Develop the Ladder Diagram Program in PLC for Material Handling and Conveyor Control
9. Develop the Ladder Diagram Program in PLC for Feeding, Pick and Place Operation.
10. Experiments on Sensor and Actuator Interfacing and PLC to PLC Communication.

METHODS OF EVALUATION

1	Assessment – I	**25%**
2	Assessment – II	
3	Continuous Assessment Laboratory	**25%**
4	Total Internal Assessment	**50%**
5	End Semester Examination (Theory)	**25%**
6	End Semester Examination (Lab)	**25%**
7	End Semester Examination	**50%**
8	Total	**100**

COURSE INSTRUCTOR
(DR. C. ARUN PRAKASH)

PROFESSOR I/C - ~~ME~~ MECHATRONICS
(DR. J. JANCI RANI)