GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering
Subject Code: 3171508
Semester – VII
Subject Name: FACTORY AUTOMATION

Type of course: Professional Elective

Prerequisite: Nil

Rationale:
The course aims to impart basic knowledge to the students and to understand the concepts & broad principles of automation in Factories/industries.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs
1	**Introduction:** Introduction: Automation in Production System, Principles and Strategies of Automation, Basic Elements of an Automated System, Advanced Automation Functions, Levels of Automation. Flow lines & Transfer Mechanisms, Fundamentals of Transfer Lines.	08
2	**Material handling and Identification Technologies:** Overview of Material Handling Systems, Principles and Design Consideration, Material Transport Systems, Storage Systems, Overview of Automatic Identification Methods.	10
3	**Automated Manufacturing Systems:** Components, Classification and Overview of Manufacturing Systems, Manufacturing Cells, GT and Cellular Manufacturing, FMS, FMS and its Planning and Implementation. Quality Control Systems: Traditional and Modern Quality Control Methods, SPC Tools, Inspection Principles and Practices, Inspection Technologies.	13
4	**Control Technologies in Automation:** Industrial Control Systems, Process Industries versus Discrete Manufacturing Industries,	06

	Continuous Versus Discrete Control, Computer Process and its Forms.	
5	**Computer Based Industrial Control:** Introduction & Automatic Process Control, Building Blocks of Automation Systems: LAN, Analog & Digital I/O Modules, SCADA Systems& RTU. Distributed Control System: Functional Requirements, Configurations & some popular Distributed Control Systems	**08**
	Total Hours	**45**

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	**15**	**30**	**15**	**15**	**15**

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

1. Automation, Production Systems and Computer Integrated Manufacturing: M.P. Groover, Pearson Education.

2. Computer Based Industrial Control- Krishna Kant, EEE-PHI,2nd edition,2010

3. An Introduction to Automated Process Planning Systems- Tiess Chiu Chang &Richard A.Wysk

4. Performance Modeling of Automated Manufacturing Systems,- Viswanandham

Course Outcomes:

Sr. No.	CO statement	Marks % weightage
CO-1	Identify potential areas for automation and justify need for automation	15

CO-2	Apply suitable major control components required to automate a process or an activity	15
CO-3	Application of automation to translate and simulate a real time activity using modern tools	30
CO-4	Evaluate suitable automation hardware for the given application	25
CO-5	Analyse computer based industrial automation	15

List of Experiments:

Experiments based on above contents and should include below mentioned topics.

1. To study about fundamental of automations.
2. To study about Material handling and Identification Technologies.
3. To study about Automated Manufacturing Systems.
4. To study about Control Technologies in Automation.
5. To study about Computer Based Industrial Control.

List of Open Source Software/learning website:

1. www.nptel.ac.in