



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering

Subject Code: 3152311

Semester – V

Subject Name: INSTRUMENTATION, SAFETY AND MAINTENANCE IN PLASTIC INDUSTRY

Type of course: OPEN ELECTIVE

Prerequisite: NA

Rationale: The parameters of various plastic processing machines are controlled with the help of pressure & temperature measuring instruments. Knowledge and functioning of these instruments is essential for a plastic technologist. At the end of this course the student will be able to know the operation of these instruments. Also Safety and Maintenance of the machinery is equally important for having good quality products in time and avoiding unnecessary shut downs. This course will also cover the safety and maintenance aspects of the plastic processing machineries.

Teaching and Examination Scheme:

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

Content:

Sr. No.	Content	Total Hrs
1	Introduction: Basic concepts and Qualities of Measurement Basic purpose of instrumentation, Measurement and its aim, The functional elements of an instrument, Performance Characteristics.	3
2	Pressure Measurement Introduction, Pressure, Methods of Pressure Measurement, Manometers, Elastic Pressure Transducers, Electrical Pressure Transducers	6
3	Temperature Measurement Introduction, Temperature, Temperature Scales, Methods of Temperature Measurement, Expansion Thermometers, Filled System Thermometers, Electrical Temperature Instruments.	6
4	Plant Maintenance :	3



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	Introduction and Maintenance Overview ,Types of Maintenance, Maintenance of Plastics processing machines.	
5	Safety Introduction, Types of Safety, Causes of fire, Safety-Hazards in Plastic Industry, Safety measures in plastic processing machines	4
6	Corrosion, Wear and Lubrication Types of Corrosion, Corrosion control and Prevention Types of Wear, Preventive Methods for Wear Lubricant, Function of Lubricant, Types of Lubricant, Properties of Lubricants, Desirable Qualities of an Ideal Lubricants, Effect of additives on Lubricants, Methods of Engine Lubrication, Lubrication failure and factors affecting .	6

Suggested Specification table with Marks (Theory): (For BE only)

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
15	20	20	7	4	4

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. **Industrial Instrumentation and Control- S.K. Singh**
2. **Maintenance Engineering – Sushil Kumar Srivastava**
3. **Maintenance Engineering Hand Book- Higgins & Morrow**
4. **Plastics Industry Safety Hand Book- Dominick V Rosato & John R. Lawrence**
5. **Engineering Chemistry- Jain&Jain**

Course Outcomes:



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The theory should be taught and practical should be carried out in such a manner that students are able to acquire required learning outcomes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

Sr. No.	CO statement	Marks % weightage
CO-1	To operate various pressure measuring instrument.	20
CO-2	To operate various temperature measuring instruments.	25
CO-3	To perform preventive break-down maintenance of Plastics Processing machines.	15
CO-4	To organize safety equipment in Plastic Industry.	15
CO-5	To perform lubrication to prevent corrosion and wear.	25

List of Experiments: As per Syllabus

Major Equipment:

List of Open Source Software/learning website:

- i. <https://lecturenotes.in/subject/99/process-control-instrumentation-pciiii>.
- ii. http://sdmp.ac.in/DTLE/Plant_Safety_&_Maintenance
- iii. <https://www.smartzworld.com/notes/maintenance-safety-engineering-notes-pdf-mse-notes-pdf/>