



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Engineering

Level: PG

Branch: Plastic Engineering

Course/Subject Code: ME01084081

Course/Subject Name: Instrumentation & Control In Plastic Industry

w.e.f. Academic Year:	2024-25
Semester:	1 st Semester
Category of the Course:	PEC

Course Outcome:

After Completion of the Course Student will able to:

No	Course Outcomes
01	Control the parameters of various plastic processing machines with the help of pressure & temperature measuring instruments.
02	Implement instrumentation knowledge for various controls and motion of various parts of Plastic Processing machines.
03	Operate the various instruments.
04	Learn data analysis and feedback system

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+(PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Tutorial/ Practical		
				ESE (E)	PA/ CA (M)	PA/CA(I)	ESE (V)	
3	0	2	4	70	30	20	30	150

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	Basic concepts and Qualities of Measurement Basic purpose of instrumentation, Measurement and its aim, The functional elements of an instrument, Performance Characteristics.	6	20
2.	Pressure Measurement Introduction, Pressure, Methods of Pressure Measurement, Manometers, Elastic Pressure Transducers, Electrical Pressure Transducers	12	25
3.	Temperature Measurement Introduction, Temperature, Temperature Scales, Methods of Temperature Measurement, Expansion	12	25



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	Thermometers, Filled System Thermometers, Electrical Temperature Instruments.		
4.	Controllers: Temp controllers-analog & digital. Power controllers. Dual output controllers. Time temp characteristics: Thermal characteristics of systems. Modeling of responses.Temp. Characteristics. Tuning of the controller parameters: Performance criteria. Effect of PID parameters. Pre tuned temp controllers. Self tuning temp controllers.	7	15
5.	Injection molding process controls: Mould cycles –Machinery used-parts and functions-starts-up and shut down procedures-cylinder nozzles-press capacity projected area- On machine monitor - Temperature control of barrel and melt PID in pre controller - Relating process control to process parameters - Adaptive ROM programmable - Simplified approach to undesirable process control - Process control techniques - Total injection molding proc. Control.	8	15
	Total	45	100

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
15	15	20	10	5	5

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

Books:

1. Industrial Instrumentation and Control- S.K. Singh
2. Hand book of controls & instrumentation- J.D. Lenk
3. Measurement & Control - P.D. Roberts;
4. Instruments & control systems - C.L.Smith

(b) Open source software and website:



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1) <https://nptel.ac.in/>

2) <https://pslc.ws/>

Suggested Course Practical List: As per the above syllabus topics

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