

Government Polytechnic Gariyaband Dist- Gariyaband

Department of Mechanical Engineering

LESSON PLAN

Session :- 2024-25 (Jan-June-25)

Name of Faculty :- **LALIT KUMAR SAHU**

Course :- **Diploma**

Branch/Semester :- **Mechanical (4th Sem)**

Total Class Per Week :- **05**

Subject Name & Code :- **Industrial Measurements & Control 2037473(037)**

Unit No.	No Of Lecture Required	Topic to be covered	Lecture no.	Actual no. of Lecture taken	Planned Date	Execution Date	Delivery Method	Remark
Unit-1.0 Measurement System.	(Approx. Hrs: L+P+T=13)	1.1 Introduction to measurement and measuring instruments, Classification of measuring Instruments, their characteristics like sensitivity, accuracy, linearity, threshold, resolution, etc.	01-03	01-03	3,4,6 Feb 2025	3,4,6 Feb 2025.	White Board	
		1.2 Measuring system, Block diagram with example, stages of measuring system with examples - Stage I input signal (detector transducers), Stage II (intermediate modifying), and Stage III (terminating), Types of input signals.	04-07	04-07	7,10,11 Feb 2025	7,10,11 Feb 2025	White Board Projector	
		1.3 Measurement standards:- Time, frequency, Voltage, Current, 3-15 psi etc., ANSI, ASME, ADA, BS, DIN, CSMR, FCI, API, ISI, and introduction Reliability and safety.	08-10	08-10	12,13,14 Feb 2025.	12-13-14 Feb 2025.	—	
		1.4 Transducers -primary and secondary transducers, classification, working principle of resistance, inductance, capacitance and	11-13	11-13	17,18,19 Feb 25	17,18,19 Feb 25.	—	

		piezoelectric transducers with their line sketches, applications of each, sensors, types and applications, difference between transducer and sensor.								
		Tutorial Class/RemidialClass/Doubt Class							Notes.	
		Assignment		Unit 2 (1)					Projector	
Unit-2.0 Introduction to Control system	(Approx. Hrs: P+L+T = 15)	2.1 Definition, Basic terminology, Objective of control system, Types of Control Systems, Effect of Feedback Systems,	14-16	14-16	20-2-28 3:5/03/28.	20 Feb 28. 3,5 Marches				
		2.2 Basic elements of open and closed loop system, concept of open loop and closed loop systems, Block diagram of Open loop and closed loop control systems, Effect of feedback, multivariable control systems comparison, Applications and advantage	17-20	17-20	7,10,12 17 March 28	7-10,12 17, March 2028.				
		2.3 Time Response of feedback control systems: Standard test signals-unit step, ramp, impulse and parabolic	21-22	21-22	18-19 March 28.	18-19 03/28				
		2.4 Process Control and its benefits, Basic control actions, Two position or On/Off control, Introduction to PI, PD and PID Controllers.	23-24	23-24	20-21 March 28	20-21 03/28				
		2.5 Control System Components: construction and working, concept of ac servomotor, synchronous and stepper motor	25	25	24/03/28	24/03/28				
		Tutorial Class/RemidialClass/Doubt Class	26-28	26-28	27-28. March 28	27-28 March 28				Notes
		Assignment			Unit 2 (2)					
Unit-3.0 Displacement and speed measurement	(Approx. Hrs: P+L+T = 13)	3.1 Working principle & use of Potentiometer, Differential transformer (LVDT & RVDT), capacitive element & Optical encoders.	30-31	30-31	2-03 April 28.	2,3 June 28.				
		3.2 Mechanical tachometer, Electrical Tachometer, incremental optical encoder, Eddy current drag cup tachometer.	32-33	32-33	4-7 April 28.	4,5 June 28.				
		3.3 Magnetic pickup. tachometer, Stroboscopic tachometer, Photoelectric tachometer, non contacting electrical	34-36	34-36	8-9-11 April 28	6,9,20 June 28,				

		tachometer (inductive pick up & capacitive pick up)					
		3.4 Press working: Emphasis that press working is not forming process, Punching, Blanking, Notching, Lancing, Slitting, Nibbling, Trimming	37-40		16-17-19-21 April 23.		
		Tutorial Class/Remedial Class/Doubt Class	41		22-04-23		
		Assignment		Unit 3		Notes	
Unit 4.0 Temperature measurement	(Approx. Hrs: P+L+T = 16)	4.1 Principles of temperature measuring devices -change in physical state, expansion, electrical resistance, thermoelectric emf, intensity of radiation, change in chemical state.	42-44		23-24-25 April-23		
		4.2 Construction, working, measuring range, accuracy, applications, limitations of devices operating on above principles (Bimetal thermometer, pressure spring thermometer, electrical resistance thermometer, thermister, thermocouple, pyrometer).	45-48		1, 2, 5, 6 May-23		
		4.3 Errors in temperature measurement i. Instrument error -calibration error, ambient temperature error, hysteresis error. ii. Thermal probe error -time lay error, conduction error, radiation error, velocity of error.	49-50		2, 8 May 23		
		4.4 Calibration of temperature measuring instruments -Direct comparison method, fixed point method..	51-52		9-13 May 23.		
		Tutorial Class/Remedial Class/Doubt Class	53		14 May 23.		
		Assignment		Unit 4		Notes.	
Unit-5.0 Flow and Pressure measurement	(Approx. Hrs: P+L+T = 14)	5.1 Classify flow measuring devices as Volumetric or primary or quantity meters and rate of flow or velocity or secondary meters, their function and examples.	54		20 June 23.		
		5.2 Volumetric or Primary meters - Bellow type meter, Rotating impeller type meter, Positive displacement meter, Rotating lobe	55		23 June 23		

(A) Flow measurement

(B) Pressure Measurement

meter, Nutating disc meter Their function, working principle, sketches, applications and limitations.

5.3 Rate of flow or Secondary meters -

Obstruction meters

Orifice

Venturimeter

Flow nozzles,

Variable area meter

Pitot tube

Velocity probes

Total pressure

probes,

Static pressure probes, Direction sensing probes

Special meters

Turbine meter

Hot wire

anemometer,

Magnetic flow meter Their function, working principle, sketches, applications and limitations.

5.4 Classify pressure measuring devices - Manometer, Elastic gauges

Diaphragm

Pressure capsules,

Bellows

Pressure springs

Electronic pressure sensors/Transducers - Resistance, Inductance and Capacitive type

5.5 Their function, principle, working, sketches, applications and limitations of above pressure measuring devices.

56-58

4, 5, 6

June

23

59-60

19-20

June

25

61

21 June

23

	5.6 Low pressure gauges-McLeod Gauge, Pirani gauge.	62		23-544 23.			
	5.7 Calibration of pressure gauges using Dead weight Pressure tester.	63		24-544 23.			
	Tutorial Class/RemidialClass/Doubt Class						
	Assignment		Unit (5)				

Total Number Of Lecture Planed :- 63

Total Number Of Lecture Executed :- 36

Signature of Subject Faculty

Date.....

[Handwritten Signature]
23-06-23

H.O.D (Mechanical Engg.)

Date.....