SYNERGY SCHOOL OF ENGINEERING,DHENKANAL

LESSON PLAN
Session (2026-2027)

Discipline: Mechanical Engineering	**Semester:** 5th , Winter/2026	**Name of the Faculty:** Mr Girish Chandra Swain, H.O.D **Email ID:** kousalyadebraj@gmail.com
Subject: MEPC301 TH:1 METROLOGY AND MEASUREMENT	**No. of Days/week:** 03	**Start Date:**01/07/2026 **End Date:**05/11/2026

Week	Class Day	Theory Topics	Date Of Delivery
1st	1st	Introduction to measurements: Definition of measurement; Significance of measurement, Methods of measurements: Direct & Indirect	
	2nd	Generalized measuring system; Standards of measurements: Primary & Secondary	
	3rd	Factors influencing selection of measuring instruments	
2nd	1st	Terms applicable to measuring instruments: Precision and Accuracy, Sensitivity and Repeatability, Range, Threshold, Hysteresis, calibration;	
	2nd	Errors in Measurements: Classification of errors, Systematic and Random error.	
	3rd	Measuring instruments: Introduction; Thread measurements: Thread gauge micrometer;	
3rd	1st	Angle measurements: Bevel protractor, Sine Bar; Gauges: plain plug gauge, ring Gauge, snap gauge, limit gauge;	
	2nd	Comparators: Characteristics of comparators, Types of comparators; Surface finish: Definition, Terminology of surface finish,	
	3dr	Talysurf surface roughness tester; Co-ordinate measuring machine	
4th	1st	Problem solve & previous year question discussion	
	2nd	Transducers and Strain gauges: Introduction; Transducers: Characteristics, classification of transducers, two coil self-inductance transducer, Piezoelectric transducer	
	3dr	Strain Measurements: Strain gauge, Classification, mounting of strain gauges,	
5th	1st	Strain gauge rosettes- two and three elements. Measurement of force, torque, and pressure:	
	2nd	Introduction; Force measurement: Spring Balance, Proving ring	
	3rd	Load cell; Torque measurement: Prony brake, Eddycurrent,	
6th	1st	Hydraulic dynamometer	
	2nd	Pressure measurement: Mcloed gauge	
	3rd	Doubt Clearing Class	
7th	1st	Quiz Test	
	2nd	Problem solve	
	3rd	Applied mechanical measurements: Speed measurement	

8th	1st	Classification of tachometers, Revolution counters, Eddy current tachometers;	
	2nd	Displacement measurement: Linear variable Differential transformers (LVDT)	
	3rd	Flow measurement: Rotometers, Turbine meter;	
9th	1st	Temperature measurement: Resistance thermometers, Optical Pyrometer.	
	2nd	Miscellaneous measurements: Humidity measurement: hair hygrometer; Density measurement: hydrometer;	
	3rd	Liquid level measurement: sight glass, Float gauge; Biomedical measurement: Sphygmo monometer	
10th	1st	Previous year question discussion	
	2nd	Limits, Fits & Tolerances: Concept of Limits, Fits, and Tolerances; Selective Assembly; Interchangeability; Hole and Shaft Basis System	
	3rd	Taylor's 8 10 Principle; Design of Plug; Ring Gauges; IS 919-1993 (Limits, Fits & Tolerances, Gauges} IS 3477-1973; concept of multi gauging and inspection.	
11th	1st	Angular Measurement: Concept; Instruments for Angular Measurements	
	2nd	Working and Use of Universal Bevel Protractor, Sine Bar, Spirit Level; Principle of Working of Clinometers;	
	3rd	Angle Gauges (With Numerical on Setting of Angle Gauges). Screw thread Measurements: ISO grade and fits of thread	
12th	1st	Errors in threads; Pitch errors; Measurement of different elements such as major diameter, minor diameter, effective diameter, pitch;	
	2nd	Two wire method; Thread gauge micrometer;	
	3rd	Working principle of floating carriage dial micrometer.	
13th	1st	Previous year question discussion	
	2nd	Gear Measurement and Testing: Analytical and functional inspection; Rolling test	
	3rd	Measurement of tooth thickness (constant chord method); Gear tooth vernier; Errors in gears such as backlash	
14th	1st	runout, composite. Machine tool testing: Parallelism;..	
	2nd	Straightness; Squareness; Coaxiallity; roundness; run out;.	
	3rd	alignment testing of machine tools as per IS standard procedure	
15th	1st	Discussion of Previous year questions	
	2nd	Discussion of Previous year questions	
	3rd	Discussion of Previous year questions	

1/6/26

Concern Faculty

01/06/26

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