

LESSON PLAN FOR ACADEMIC SESSION 2026-27 (Winter)

Discipline: Mechanical Engg.	Semester:5th	Name of the Teaching Faculty: ANUP RANA Designation: Lecturer S-1
Subject: Metrology and Measurement (Th.1)	No. of days/week class allotted:03	Semester From: 01.07.2026 to 05.11.2026 No. of weeks: 15
Week	Class Day	Theory/Practical Topics
1 ST	1 st	Introduction to Metrology and Measurement
	2 nd	Introduction to measurements: Definition of measurement; Significance of measurement
	3 rd	Methods of measurements: Direct & Indirect; Generalized measuring system;
2 ND	1 st	Standards of measurements: Primary & Secondary; Factors influencing selection of measuring instruments
	2 nd	Terms applicable to measuring instruments: Precision and Accuracy, Sensitivity and Repeatability, Range, Threshold, Hysteresis, calibration
	3 rd	Errors in Measurements: Classification of errors, Systematic and Random error.
3 RD	1 st	Measuring instruments: Introduction; Thread measurements: Thread gauge micrometer; Angle measurements: Bevel protractor, Sine Bar;
	2 nd	Gauges: plain plug gauge, ring Gauge, snap gauge, limit gauge;
	3 rd	Comparators: Characteristics of comparators, Types of comparators;
4 TH	1 st	Surface finish: Definition, Terminology of surface finish, Talysurf surface roughness tester; Co-ordinate measuring machine.
	U 2 nd	Transducers and Strain gauges: Introduction
	3 rd	Transducers: Characteristics, classification of transducers,
5 TH	1 st	Two coil self-inductance transducer, Piezoelectric transducer
	2 nd	Strain Measurements: Strain gauge, Classification, mounting of strain gauges,
	3 rd	Strain gauge rosettes- two and three elements.
6 TH	1 st	Measurement of force, torque, and pressure:
	2 nd	Introduction; Force measurement: Spring Balance, Proving ring,
	3 rd	Load cell; Torque measurement: Prony brake, Eddycurrent, Hydraulic dynamometer;
7 TH	1 st	Pressure measurement: Mcloed gauge
	2 nd	CLASS TEST
	U 3 rd	Applied mechanical measurements: Speed measurement
8 TH	1 st	Classification of tachometers, Revolution counters, Eddy current tachometers
	2 nd	Displacement measurement: Linear variable Differential transformers (LVDT)
	3 rd	Flow measurement: Rotometers, Turbine meter;
9 th	1 st	Temperature measurement: Resistance thermometers, Optical Pyrometer
	2 nd	Miscellaneous measurements: Humidity measurement: hair hygrometer;
	3 rd	Density measurement: hydrometer; Liquid level measurement: sight glass,
10 TH	1 st	Float gauge; Biomedical measurement: Sphygmo monometer
	U 2 nd	Limits, Fits & Tolerances: Concept of Limits, Fits, and Tolerances
	3 rd	Selective Assembly; Interchangeability; Hole and Shaft Basis System
	1 st	Taylor's Principle; Design of Plug;

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11 TH	2 nd	Ring Gauges; IS 919-1993 (Limits, Fits & Tolerances, Gauges} IS 3477-1973; concept of multi gauging and inspection.
	3 rd	Angular Measurement: Concept;
12 th	1 st	Instruments for Angular Measurements; Working and Use of Universal Bevel Protractor, Sine Bar,
	2 nd	Spirit Level; Principle of Working of Clinometers; Angle Gauges (With Numerical on Setting of Angle Gauges).
	3 rd	Screw thread Measurements ISO grade and fits of thread; Errors in threads; Pitch errors
13 TH	1 ST	Measurement of different elements such as major diameter, minor diameter, effective diameter,
	2 ND	Pitch; Two wire method; Thread gauge micrometer , Working principle of floating carriage dial micrometer
	U 3 rd	Gear Measurement and Testing: Analytical and functional inspection;
14 th	1 st	Rolling test; Measurement of tooth thickness (constant chord method);
	2 nd	Gear tooth vernier; Errors in gears such as backlash, runout, composite.
	3 rd	Machine tool testing: Parallelism; Straightness
15 th	1 st	Squareness; Coaxiality; roundness;
	2 nd	Run out; alignment testing of machine tools as per IS standard procedure.
	3 rd	REVISION
TOTAL NO. OF CLASSES=45		

Prepared By:


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