#### MODULE 1

# Chapter 1: Introduction to Metrology and Design of Gauges 1-1 to 1-46

1.1	Introduction	to	Metro	ology,	Need	for	inspecti	on,
	Fundamental	prir	nciples	and	definition	n, S	tandards	of
	measurement	, Er	rors in	mea	suremer	nts, I	nternatio	nal
	standardizatio	n.						

1.2 Limits, fits and tolerances of interchangeable manufacture, Elements of interchangeable system, Hole based and shaft based systems, Tolerance grades, Types of fits, General requirements of Go & No go gauging, Taylor's principle, Design of Go & No go gauges.

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### MODULE 2

# Chapter 2 : Flatness Test Measurement by Interference Principle, Surface Texture Measurement, Screw Thread Measurement And Gear Measurement 2-1 to 2-43

- 2.1 Principles of interference, Concept of flatness, Flatness testing, Optical flats, Optical Interferometer and Laser interferometer.
- 2.2 Surface texture measurement: importance of surface conditions, roughness and waviness, surface roughness standards specifying surface roughness parameters Ra, Ry, Rz, RMS value etc., Surface roughness measuring instruments.
- 2.3 **Screw Thread measurement :** Two wire and three wire methods, Floating carriage micrometer.
- 2.4 **Gear measurement :** Gear tooth comparator, Master gears, Measurement using rollers and Parkinson's Tester.

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#### MODULE 3

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  measurement system, types of inputs : Desired,
  interfering and modifying inputs.
- 3.2 Static characteristics: Static calibration, Linearity, Static Sensitivity, Accuracy, Static error, Precision, Reproducibility, Threshold, Resolution, Hysteresis, Drift, Span and Range etc.

Dr	iff, Span and Range etc.
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- **4.2 Strain Measurement :** Theory of Strain Gauges, gauge factor, temperature Compensation, Bridge circuit, orientation of strain gauges for force and torque, Strain gauge based load cells and torque sensors.

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- 4.4 **Flow Measurement :** Bernoullis flowmeters, Ultrasonic Flowmeter, Magnetic flow meter, rotameter.
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