



# GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Bachelor of Vocation (B.Voc.), 5<sup>th</sup> Semester

Branch: Production Technology

Subject Name: Mechanical Metrology-II Lab

Subject Code: 21150305

**Type of course:** Core

**Prerequisite:** Nil

**Rationale:** To impart comprehensive knowledge about consideration measuring instruments, their calibration, and the quality control of manufactured products.

## Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical		
			ESE(E)	PA(M)	PA(V)	PA(I)		
0	0	2	2	0	0	30	20	50

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment

## Contents:

Sr. No.	Practical / Hands on Exercise	Total Hrs.	% Weightage
1.	Basic understanding of measurements and metrology: concepts, application, advantage and future aspects.	2	5
2.	Performance on Temperature measurements and check different characteristics of measurements and also do calibration.	4	15
3.	Performance on Stress, strain and force measurements and check different characteristics of measurements.	6	20
4.	Performance on surface measurements.	4	15
5.	Performance on measurements of gears threads.	4	15
6.	Performance on measurements of screw threads.	4	15
7.	Performance on pressure measurements and check different characteristics of measurements and also do Calibration.	4	15
	<b>Total</b>	<b>28</b>	<b>100</b>

## Major Equipment:

1. Temperature and pressure Measurements Equipments/Devices/Sensors.
2. Stress/Strain/Force Measurements Equipments/Devices/Sensors.
3. Surface Measurements Equipments/Devices/Sensors
4. Resistive Potentiometer, Tachometers, Piezoelectric Accelerometer
5. Gears/Screw Threads Measurements Equipments/Devices/Sensors
6. Miscellaneous measurements equipments



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## Course Outcomes:

Students will be able to:

Sr. No.	CO Statement	Marks % Weightage
CO 1	Summarize various methods and terms used in mechanical measurements and metrology.	10
CO 2	Students will discriminate between various Screws and Gears by measuring their dimensions.	30
CO 3	Students will describe methods of measurement for various quantities like force, torque and strain.	20
CO 4	Students will select appropriate temperature and pressure measuring device for various applications	20
CO 5	Students will discriminate capabilities of machining process by measuring surface finish of the component produced	20

## References:

1. Mechanical Measurement and Metrology by R K Jain, Khanna Publisher Mechanical Measurement & Control by D.S. Kumar
2. A course in Mechanical Measurements and Instrumentation, A K Sawhney, Dhanpat Rai Publications
3. Mechanical Measurements and Instrumentations, Er. R K Rajput, Kataria Publication(KATSON)
4. Metrology and Measurement, Anand Bewoor & Vinay Kulkarni McGraw-Hill

## List of Open Source Software/learning website:

- 1) NPTEL tutorials