ROHINI

COLLEGE OF ENGINEERING AND TECHNOLOGY

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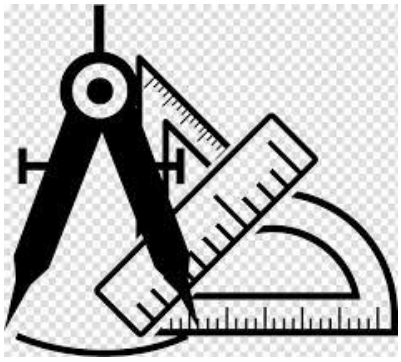
DEPARTMENT OF MECHANICAL ENGINEERING

24ME403 - METROLOGY & MEASUREMENTS

Dr. A. ARUL MARCEL MOSHI,

ASSOCIATE PROFESSOR / MECH.



UNIT I: BASICS OF METROLOGY

CO1: To explain the basics of standards of measurement and errors in industrial applications.

Introduction to Post-Harvest Technology

Meaning of 'Metrology':

Metrology is a combination of two Greek words:

- Metro – Measurement &
- Logy – Science
- Metrology – Science of pure measurement

Metrology is concerned with the following activities:

- To establish, reproduce, conservate and transfer of unit of measurement and their standards.
- To deal with the errors of measurement
- To ensure the uniformity of measurements
- To develop new methods of measurements
- To analyze the new methods and their accuracy
- To establish the uncertainty of measurement
- To design, manufacture and test gauges
- To develop various techniques for industrial inspection

Need for measurement:

- To determine the true dimensions of a part
- To increase our knowledge and understanding of the world
- To ensure the public health and safety
- To convert the physical parameters into meaningful numbers
- To test whether the elements which constitute the system function as per the design
- To evaluate the performance of a system
- To study the basic law of nature

- To ensure the interchangeability with a view to promote the mass production
- To evaluate the response of the system
- To check the limitations of theories in practical situations
- To establish the validity of design and finding new data and new designs

Requirements for the measurement:

- The standards used for the measurement must be accurate and internationally accepted.
- The apparatus / instrument and processes used for the measurement must be provable.

Basic SI Units:

Parameter	Unit	Symbol
Length	metre	m
Temperature	Kelvin	K
Electric current	Ampere	A
Time	second	s
Luminous intensity	candela	cd
Mass	kilogram	kg
Amount of substance	mole	mol

Important considerations in measurement:

- Measurand – the physical quantity, property, or condition that is being measured.
- Reference – a known and stable standard against which the measurand is compared to determine its value.
- Comparator – the instrument or device that detects and indicates the difference between the measurand and the reference.