SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution
Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF MECHATRONICS

19MCB303 – SENSORS AND SIGNAL PROCESSING

UNIT 1 – SCIENCE OF MEASUREMENT

CALIBRATION TECHNIQUE

Mrs. P.KALAISELVI M.E.,(Ph.D.,)

ASSISTANT PROFESSOR,

DEPARTMENT OF MECHATRONICS,

SNSCT, Coimbatore.

Syllabus

UNIT-I	SCIENCE OF MEASUREMENT	9

Units and Standards– Calibration techniques –Errors in Measurements– Generalized Measurement System–Static and dynamic characteristics of transducers– Generalized Performance of Zero Order and First Order Systems - Response of transducers to different time varying inputs – Classification of transducers-Introduction to second order systems.

INTRODUCTION

❑ Calibration is the act of comparing a device under test (DUT) of an unknown value with a reference standard of a known value.

❑ Typically, the accuracy of the standard should be ten times the accuracy of the measuring device being tested.

Why Calibration is important?

❑ Calibration of your measuring instruments has two objectives. It checks the accuracy of the instrument and it determines the traceability of the measurement. In practice, calibration also includes repair of the device if it is out of calibration.

Don't call the Nobel Committee just yet: We forgot to calibrate the instruments before the experiment...

Calibration Procedure

The simplest calibration procedure for an analog, linear instrument is the so-called zero-and-span method. The method is as follows:

❖ Apply the lower-range value stimulus to the instrument, wait for it to stabilize

❖ Move the "zero" adjustment until the instrument registers accurately at this point

❖ Apply the upper-range value stimulus to the instrument, wait for it to stabilize

❖ Move the "span" adjustment until the instrument registers accurately at this point

❖ Repeat steps 1 through 4 as necessary to achieve good accuracy at both ends of the range

Types of Calibration

❑ **Primary Calibration**

Calibration by comparison with a source of known value. An example of a source calibration scheme is measuring an ohmmeter using a calibrated reference standard resistor.

❑ **Secondary Calibration**

Calibration by comparison of the DUT measurement with the measurement from a calibrated reference standard.

Thank You

Calibration Technique/19MCB303 - SENSORS AND SIGNAL PROCESSING P.KALAISELVI,AP/MCT/SNSCT