

UEIXXXMEASUREMENT SCIENCE

L	T	P	Cr
3	1	2	4.5

Introduction: Definition: Application and types of measurements, measurement techniques for various physical parameters, Standards, Calibration, Selection of instruments.

Measurement science for physical parameters: Introduction to measurement of physical parameters, Rectilinear flow of heat, Thermal conductivity measurement, Seebeck effect, Peltier Effect, Johnson effect, Thermoelectric power, Thermoelectric diagram, application of thermodynamics for temperature measurement. Introduction to sound measurement, acoustic intensity, acoustic emission, sound level meter, microphones, microphone response characteristics. pressure response of a capacitor microphones, Basic methods of pressure measurement, manometers, various forms of manometers, manometer dynamics, measurement techniques for force and torque.

Analysis of Experimental data: Introduction, Causes and types of Experimental Errors, Error analysis on a common-sense basis, Uncertainty analysis, Evaluation of uncertainties for complicated data reduction.

Introduction to statistical analysis: Measures of central tendency and dispersion: mean, median, mode, range, mean deviation and standard deviation. Regression and correlation analysis. Probability and probability distributions; Binomial, Poisson, and Normal distribution.

Laboratory Work:

Experiments around Measurement of Pressure, Temperature, Flow, Force, Torque using different techniques.

Course Learning Outcomes:

After the successful completion of the course the students will be able to:

1. Explain different terms used in measurement
2. Analyse experimental data.
3. Differentiate among various statistical techniques.
4. Explain the measurement of Sound, temperature and pressure.

Text Books:

3. *Doebelin, E.O. and manic, D.N., Measurement Systems: Applications and Design, McGraw-Hill (2004).*
4. *Holman, J.P. Experimental methods for engineers, Tata McGraw Hill, (2004).*

Reference Books:

3. *Murthy, D.V.S., Transducers and Instrumentation, Prentice Hall of India (2003).*
4. *Sawhney, A.K. and Sawhney, puneet, A Course in Electrical and Electronic Measurements and Instrumentation, Dhanpat Rai (2008).*
5. *Nakra, B.C. and Chaudhry, K.K., Instrumentation, Measurement and Analysis, Tata McGraw Hill (2003).*

Evaluation Scheme:

Sr. No.	Evaluation Elements	Weightage (%)
1	MST	25
2	EST	35
3	Sessionals (May include Assignments/Projects/Tutorials/Quizzes/Lab Evaluations)	40