

CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-

g) Course Content

UNIT I INTRODUCTION TO MEASUREMENTS AND TRANSDUCERS 9

Generalized measurement system - Units and standards – Static calibration – Classification of errors - Limiting error and probable error – Error analysis – Statistical methods – Odds and uncertainty – Classification of transducers – Selection of transducers

UNIT II CHARACTERISTICS OF TRANSDUCERS 9

Static characteristics – Accuracy, precision, resolution, threshold, sensitivity, linearity, repeatability, reproducibility, loading effect, drift, static error, span and range, hysteresis, dead time and dead zone - Dynamic characteristics – Time Response of I order transducer for impulse, step and ramp signals- Time Response of II order transducer for impulse and step signals- Frequency response of transducer.

UNIT III RESISTANCE TRANSDUCERS 9

Principle of operation, construction details, characteristics and applications of potentiometer - Strain gauge – types - Resistance temperature detector (RTD)- Thermistor –Hot-wire anemometer – constant current and constant temperature operation - Resistive humidity sensor

UNIT IV INDUCTANCE AND CAPACITANCE TRANSDUCERS 9

Induction potentiometer – Variable reluctance transducer – Eddy current transducer –Principle of operation, construction details, characteristics and applications of Linear Variable Differential Transducers –Capacitive transducer and types - Differential arrangement – Variation of dielectric constant for measurement of liquid level - Dynamic microphone.

UNIT V MODERN TRANSDUCERS 9

Piezoelectric transducer – Hall Effect transducer – Magneto resistor - Digital displacement transducer– Fiber optic sensor - Introduction to SQUID sensor, Touch screen sensor, Smart Transducer, MEMS and Introduction to linearization of transducer.

Total 45 Hrs

h) Learning Resources

Text Books

1. Ernest O.Doebelin,- Measurement systems , 6th Edition, Tata McGraw Hill Education Private Ltd, New Delhi, 2012.
2. A.K. Sawhney,- A course in Electrical & Electronic Measurement and Instrumentation, DhanpatRai and Company Private Limited, Reprint: 2014.

Reference Books

1. D. Patranabis, —Sensors and Transducers , 2nd Edition, Prentice Hall of India, 2010.
2. John P.Bentley, —Principles of Measurement Systems , 4th Edition, Pearson Education, 2004.
3. Neubert H.K.P., —Instrument Transducers – An Introduction to their Performance and Design , Oxford University Press, Cambridge, 2003 .
4. Murthy D.V.S., —Transducers and Instrumentation , 2nd Edition, Prentice Hall of India Private Limited, New Delhi, 2010.
5. S.Renganathan, —Transducer Engineering , Allied Publishers, 2005.