EI 212 **Basic Instrumentation** **3(2+1)**

Unit I

Introduction to Instrumentation and Measurements, Types of Measurements, Instrument Characteristics, Sensors and Transducers, GuideLines for Selection of Sensorand Transducers.

Unit II

Measurement of Resistance using Wheatstone bridge, Kelvin's single and Double Bridge,Measurement of Inductance using Maxwell's Inductance bridge,Maxwell's Inductance capacitance bridge and Anderson's bridge, Measurement of Capacitance using Schering Bridge andWien's bridge.

Unit III

Resistive Displacement, Capacitive Displacement and Inductive Displacement sensor, Piezo electric sensor,Light Dependent Resistor, Photo Diode, Photo Transistor and Photo Resistor. Moisture and Humidity sensor.

Unit IV

Temperature Sensor: RTD, Thermistor, Thermo-CoupleTemperature IC, optical and radiation Pyrometer Principal, Construction, practical Working and Limitations. Application to Agriculture.

Unit V

Flow Sensor: Bernoulli's theorem, Venturi flow meter, Flow nozzle, orifice flow meter, propeller flow meter, Electromagnetic Flow meter, and Ultrasonic Flow meter.GPS Sensor: Principal, Construction and Working, Application to Agriculture.

Reference Books:

1).Mechanical and Industrial Measurement: Process Instrumentation and Control by R.K.Jain
2).PC Based Instrumentation, Concepts and Practices by N. Mathivanan
3).Transducers and Instrumentation by DVS Murty
4).Mechanical Measurement and Control by Dr. D.S.Kumar
5).Understanding GPS: Principles and Applications by Elliott D. Kaplan Christopher J. Hegarty

Practical(s)

1. To study Measurement of Resistance using Wheatstone Bridge and Kelvin's double bridge.
2. To study Measurement of self Inductance using Maxwell's Bridge.
3. To study Measurement of self Inductance using Anderson's Bridge.
4. To study Measurement of Capacitance using Schering bridge.
5. To study Measurement of Capacitance using Wien's bridge.
6. To study Linear and Angular resistive Displacement sensor.
7. To study Linear and Angular Capacitive Displacement sensor.
8. To study Linear Variable Displacement Transducer sensor.
9. To study Temperature measurement using RTD.
10. To study Temperature measurement using Thermistor.
11. To study Temperature measurement using Thermocouples.

12 To study characteristics of Light Depending Resistance.
13 To study characteristics of Photo Diode.
14 To study Electromagnetic Flow meter.
15 To study Ultrasonic Flow meter.
16 To study working of GPS.