AMICE13 SENSORS AND TRANSDUCERS

UNIT-1 INTRODUCTION

1.1 Basics of Measurement- Classification of errors- Error analysis-
1.2 Static and dynamic characteristics of transducers
1.3 Performance measures of sensors- Classification of sensors
1.4 Sensor calibration techniques- Sensor Output Signal Types.

UNIT-2 MOTION, PROXIMITY AND RANGING SENSORS

2.1 Motion Sensors- Potentiometers, Resolver, Encoders
2.2 Optical, Magnetic, Inductive, Capacitive, LVDT- RVDT- Synchro- Microsyn, Accelerometer.
2.3 GPS, Bluetooth, Range Sensors- RF beacons, Ultrasonic Ranging,
2.4 Reflective beacons, Laser Range Sensor (LIDAR).

UNIT-3 FORCE, MAGNETIC AND HEADING SENSORS

3.1 Strain Gage, Load Cell, and Magnetic Sensors- types, principle, requirement and advantages:
3.2 Magneto resistive- Hall Effect- Current sensor Heading Sensors- Compass, Gyroscope, Inclinometers.

UNIT-4 OPTICAL, PRESSURE AND TEMPERATURE SENSORS

4.1 Photo conductive cell, photo voltaic, Photo resistive, LDR- Fiber optic sensors- Pressure- Diaphragm, Bellows, Piezoelectric
4.2 Tactile sensors, Temperature- IC, Thermistor, RTD, Thermocouple. Acoustic Sensors- flow and level measurement, Radiation Sensors- Smart Sensors- Film sensor,
4.3 MEMS & Nano Sensors, LASER sensors.

UNIT-5 SIGNAL CONDITIONING and DAQ SYSTEMS

5.1 Amplification- Filtering – Sample and Hold circuits
5.2 Data Acquisition: Single channel and multi-channel data acquisition
5.3 Data logging - applications
5.4 Automobile, Aerospace, Home appliances,
5.5 Manufacturing, Environmental monitoring..

Reference Books:

1. C.S.Rangan,G.R.Sharma and V.S.V Mani – Instrumentation Devices and Systems – Tata McGraw Hill
2. D.P.Eckman – Industrial Instrumentation – Wiley Eastern