AMMT15 SENSORS AND SIGNAL PROCESSING

UNIT-1 SCIENCE OF MEASUREMENT

1.1 Units and Standards- Calibration techniques

1.2 Errors in Measurements- Generalized Measurement System

1.3 Static and dynamic characteristics of transducers

1.4 Generalized Performance of Zero Order and First Order Systems

1.5 Response of transducers to different time varying inputs- Classification of transducers

UNIT-2 MECHANICAL MEASUREMENTS

2.1 Temperature: Filled thermometer- Bimetallic thermometer- monometers- elastic transducers- bourdon gauge- bellows- diaphragm.

2.2 Vacuum: McLeod gauge, thermal conductivity gauge

2.3 Ionization gauge, flow measurement: orifice, venture, nozzle, pilot tube, turbine flow meter, hot wire anemometer.

UNIT-3 ELECTRICAL MEASUREMENTS

3.1 Resistive transducers- Potentiometer- RTD- Thermistor

3.2 Thermocouple- Strain gauges- use in displacement, temperature, force measurement

3.3 Inductive transducer- LVDT- RVDT- use in displacement

3.4 Capacitive transducer- Piezo electric transducer- Digital displacement transducers.

UNIT-4 SMART SENSORS

4.1 Radiation Sensors- Smart Sensors- Film sensor, MEMS & Nano Sensors- applications

4.2 Automobile, Aerospace, Home appliances,

4.3 Manufacturing, Medical diagnostics, Environmental monitoring.

UNIT-5 SIGNAL CONDITIONING AND DATA ACQUISITION

5.1 Amplification- Filtering- Sample and Hold circuits

5.2 Data Acquisition: Single channel and multi-channel data acquisition

5.3 Data logging.

Reference Books:

1. Industrial Engineering and Production Management Paperback- 1 December 2006 By Martand Telsang (Author)
2. Industrial Engineering and Management (2018-2019) Session Paperback – 1 January 2018 By O. P. Khanna (Author)