B. Tech. III (EC) Semester V	L	T	P	C
EC 313 : SENSORS & INSTRUMENTATION	**3**	**0**	**0**	**3**

- **INTRODUCTION** **(08 Hours)**
  Introduction Of Sensors And Transducers, Principles Of Operation And Their Classification, Characteristics Of Sensors, Types Of Conventional Sensors Like Resistive, Capacitive, Inductive, Electrostatic, Piezoelectric, Magnetic, Ultrasonic, Electromagnetic Sensors

- **THERMAL & FLOW SENSORS** **(08 Hours)**
  Thermal Sensors Like Acoustic Temperature Sensor, Nuclear Thermometer, Magnetic Thermometer, Resistance Change Type, Thermo EMF Junction, Semiconductor Types, Thermal Radiation, Quartz Crystal, NQR, Spectroscopic Noise Thermometry, Heat Flux Sensors. Flow Sensors like Orifice Plate, Ventury, Electromagnetic, Anemometer and Turbine Flowmeter

- **DIGITAL & SMART SENSORS:** **(08 Hours)**
  Digital Encoder, Shaft Encoder, Switches: Pressure, Level, Flow, Temperature, Proximity Switches, Limit Switches And Its Types, Isolators (Or Barriers).Introduction To Smart Sensors, Primary Sensors Excitation, Amplification, Fitters, Converters, Compensation, Information Coding / Processing, Data Communication And Automation

- **INSTRUMENTATION SYSTEM** **(11 Hours)**
  Introduction About Instrumentation System, Types Of Instrumentation System, Data Acquisition System And Its Uses In Intelligent Instrumentation System. Detail Study Of Each Block Involved In Making Of DAS, Signal Conditioners As DA, IA, Signal Converters (ADC), Sample And Hold, Designing Application For Pressure, Temperature Measurement System Using DAS, Data Logger

- **AUTOMATION SYSTEM** **(10 Hours)**
  Introduction about Automation System, Concepts of Control Schemes, Types of Controllers, Components Involved In Implementation Of Automation System I.E., DAS, DOS, Converter (I To P) And Actuators: Pneumatic Cylinder, Relay, Solenoid (Final Control Element), Computer Supervisory Control System (SCADA), Direct Digital Control's Structure And Software

(Total Contact Time: 45 Hours)

BOOKS RECOMMENDED:

1. **Patranabis D.,** *"Sensors And Transducers"*, PHI, 2nd Ed., 2004
2. **Johnson Curtis D.,** *"Process Control Instrumentation"*, Pearson Education, PHI, 2005
3. **Shawhney A. K.,** *"Electrical And Electronics Measurements And Instrumentation"*, Dhanpat Rai & Sons, 1994
4. **Kalsi H. S.,** *"Electronics Instrumentation"*, TMH, 2nd Ed., 2004
5. **Kant Krishna***, "Computer Based Industrial Control"*, PHI, 2004