LESSON PLAN

Subject :- TH:5(a) Sensors & Actuators' (**(Code) TH-5a EEPE204** **Name of faculty:-** Er Bikram Keshari Parida

Semester :-4th **Class allotted 4p/w** **Branch :- Electrical Engineering**

Discipline	Semester:-4TH	From date:-23/12/25 To date:18/4/26	45P/45H
Subject:S&A	No. of days/ per week 4p/w:	Theory –Topics/Lesson	
DATE	**PERIOD**	**TOPIC COVERED**	**REMARKS**
23/12/25 to 15/1/26		**Unit No. I : Introduction to sensors and measurement.** 1.1 Overview of measurement systems: Definition of sensor, Difference between sensor, transmitter and transducer; Primary measuring element: selection, 1.2 static and dynamic characteristics: Range; Response time; Accuracy; Precision; Sensitivity; Dead band; Dead time; Signal transmission: 1.3 Types of signal: Pneumatic signal; Hydraulic signal; Electronic Signal. Standard signal ranges 1.4 Introduction of Electronic transmitter; Pneumatic transmitter; Smart transmitters.	
16/1/26 to 07/02/26		**Unit No. II: Principles of various Sensors:** 2.1 Classification of sensors. Characteristics and calibration of different sensors 2.2 Working Principle of Displacement, Position and Motion sensors, Limit switches, Proximity sensors, LVDT, strain gauge, Tacho- generator,. Encoders, Hall sensors, Distance sensors. Light Sensor. Accelerometer, Force, Torque, Tactile sensors, Load cells, Piezoelectric transducer.	

		2.3 Principle of Piezo Resistive Type; Variable Capacitive Type; Variable reluctance 10 25 type sensors. Synchros and resolver	
09/02/26 to27/02/26		**Unit No. III: Pressure and level measuring elements:** 3.1 Bourden tube, Bellows; Diaphragm. 3.2 Application of Diaphragm: Capacitance Type, Reluctance Type, Strain Gauge Type and Inductive Type. 3.3 Application of Bellows: Electrical and Piezoelectric pressure transducers, 3.4 McLeod gage, Pirani gage and Ionisation gage. 3.5 Level sensors: Float type, Variable resistive type, Inductive type, Capacitive type.	
28/02/26 to 21/03/26		**Unit No. IV: Flow and temperature measuring elements:** 4.1 Flow sensors: Reynolds numbers; Types of Flow meters and principle of flow measurement: 4.2 Differential pressure type: orifices; venturi tubes; flow tubes; flow nozzles; pitot tubes; and Rotameter, Nutating disk & Rotary-vane types. 4.3 Velocity meters: Turbine; Vortex shedding; Electromagnetic and Mass flow meters, Anemometer, Ultrasonic flow meter. 4.4 Temperature sensors: Thermocouples, Thermistor, RTD, Pyrometer.	
23/03/26 to 18/4/26		**Unit No. V: Actuators :** 5.1 Definition and Example; selection; Types of Actuators; 5.2 Pneumatic actuator; Electro-Pneumatic actuator; cylinder, rotary actuators, Mechanical actuating system: 5.3 Hydraulic actuator; Control valves: Construction; Valve coefficient or valve sizing; valve characteristics; types of valves; valve selection. 5.4 Electrical actuating systems: Solid-state switches, Solenoids, Voice Coil; Electric Motors; Principle of operation and its application: D.C motors - AC motors – S ingle phase & 3 Phase Induction Motor; Synchronous Motor; Stepper motors – Piezoelectric Actuator.	

Signature of HOD **Signature of Faculty**