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DEPARTMENT OF ELECTRICAL ENGINEERING

Govt. Polytechnic, Balasore

LESSON PLANFOR ACADEMIC SESSION - 2025-26

TH:5(a)- SENSORS & ACTUATORS(Course Code EEPE204(A))

Course Code : EEPE204(A) TH:5(a)	**Semester : 4th**
Total Periods : 45 Hours	**Examination : 3 Hours**
Theory Periods : 3 P/Week	**Progressive Assessment: 30 Marks**
Maximum Marks : 100	**End Semester Examination : 70 Marks**
Semester From Date : 22/12/2025	**To Date :**
Name of the Teaching Faculty: Er. ANITA SHIAL	

WEEK	PERIOD	TOPIC
1st	1st	**Overview of measurement systems**: Definition of sensor, Difference between sensor, transmitter and transducer; Primary measuring element: selection
	2nd	static and dynamic characteristics: Range; Response time; Accuracy; Precision; Sensitivity; Dead band; Dead time; Signal transmission:
	3rd	Types of signal: Pneumatic signal; Hydraulic signal
2nd	1st	Electronic Signal. Standard signal ranges
	2nd	Introduction of Electronic transmitter
	3rd	Pneumatic transmitter, Smart transmitters.
3rd	1st	**Principles of various Sensors:** Classification of sensors, Characteristics and calibration of different sensors
	2nd	Working Principle of Displacement
	3rd	Position and Motion sensors, Limit switches
4th	1st	Proximity sensors, LVDT
	2nd	strain gauge, Tacho- generator
	3rd	Encoders, Hall sensors, Distance sensors
5th	1st	Light Sensor. Accelerometer, Force, Torque
	2nd	Tactile sensors, Load cells, Piezoelectric transducer.
	3rd	Principle of Piezo Resistive Type
6th	1st	Variable Capacitive Type, Variable reluctance Type sensors. Synchros and resolver
	2nd	**Pressure and level measuring elements:** Bourdon tube, Bellows; Diaphragm.

	3rd	Application of Diaphragm: Capacitance Type
7th	1st	Application of Reluctance Type, Strain Gauge Type and Inductive Type.
	2nd	Application of Bellows: Electrical and Piezoelectric pressure transducers
	3rd	McLeod gage
8th	1st	Pirani gage and Ionization gage
	2nd	Level sensors: Float type
	3rd	Variable resistive type
9th	1st	Inductive type
	2nd	Capacitive type.
	3rd	**Flow and temperature measuring elements:** Flow sensors: Reynolds numbers;
10th	1st	Types of Flow meters and principle of flow measurement:
	2nd	Differential pressure type: orifices; venturi tubes
	3rd	flow tubes; flow nozzles; pitot tubes
11th	1st	Rota meter, Notating disk & Rotary-vane types.
	2nd	Velocity meters: Turbine; Vortex shedding
	3rd	Electromagnetic and Mass flow meters,
12th	1st	Anemometer, Ultrasonic flow meter.
	2nd	Temperature sensors: Thermocouples, Thermistor
	3rd	RTD, Pyrometer.
13th	1st	**Actuators :** Definition and Example; selection; Types of Actuators;
	2nd	Pneumatic actuator; Electro-Pneumatic actuator
	3rd	cylinder, rotary actuators, Mechanical actuating system:
14th	1st	Hydraulic actuator; Control valves: Construction; Valve coefficient or valve sizing
	2nd	valve characteristics; types of valves; valve selection.
	3rd	Electrical actuating systems: Solid-state switches
15th	1st	Solenoids, Voice Coil; Electric Motors; Principle of operation and its application
	2nd	D.C motors - AC motors - Single phase & 3 Phase Induction Motor
	3rd	Synchronous Motor; Stepper motors Piezoelectric Actuator.

22/12/25

Lect. Stage-II, Elect Dept.
Government Polytechnic, BLS
Teaching Faculty

22/12/25

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