



GOVERNMENT POLYTECHNIC DARLIPALI, SUNDARGARH

ସରକାରୀ ବହୁବୃତ୍ତି ଅନୁଷ୍ଠାନ ଦଲିପାଲି, ସୁନ୍ଦରଗଡ଼

GOVERNMENT OF ODISHA | ଓଡ଼ିଶା ସରକାର

A/ P: Darlipali , NTPC Darlipali ,Dist.: Sundargarh, Odisha- 758001

Website: <https://gpdarlipali.org.in/> in E-mail: gpdarlipali24@gmail.com

DEPARTMENT OF MECHATRONICS ENGINEERING

LESSON PLAN: –Summer-2026(2025-26)

Discipline: MECHATRONICS ENGINEERING		Semester: 4 th	Name of the Teaching faculty: Sidharth Sekhar Mallick
Subject: Electrical, Electronic Sensors and Actuators Subject Code: MEPC204 TH:2		No of Days/Week class allotted: 3	Semester from Date: 22/12/2025 to 18/04/2026 No of weeks: 14 No. of Period Available: 42
Month	Week	No of periods available	Class Day Theory topics to be covered
DECEMBER	1st	3P	Introduction & Syllabus Discussion
			Unit-1 Overview of measurement systems: Measurement devices; Difference between sensor, transmitter and transducer; Smart device. Primary measuring element selection and characteristics: Range; Response time; Accuracy; Precision; Sensitivity; Dead band; Dead time; Costs; Installation Problems.
	2nd	3P	Signal transmission: Types of signal: Pneumatic signal; Hydraulic signal; Electronic Signal. Standard signal ranges: Electronic transmitter adjusted range; Pneumatic transmitter adjusted range; Transmission system dynamics; transmission Lag; Transmitter Gain; Smart transmitters.
			Unit-2 Principles of Sensors: Classification of sensors. Characteristics and calibration of different sensors.
JANUARY	3rd	3P	Unit-3 Displacement, position and motion sensors: Principles of variable resistance, variable inductance, variable reluctance, variable capacitance type sensors. Position and Motion sensors: Limit switches; Proximity sensors: Pneumatic Proximity sensor; Optical Proximity sensor; Inductive Proximity sensor; Capacitive Proximity sensor; Ultrasonic Proximity sensor. LVDT: construction; Working principle; signal conditioning; use of LVDT. The Tacho-generator: DC tachogenerator;
			Revision Chapter-1 & 2
			Class Test-1
			Digital Tachogenerator; Optical type and magnetic type. Synchro and resolver.
	4th	3P	Encoders: types of encoders Hall sensors: Working principle; Hall effect gear tooth sensors. Distance sensors. Light Sensor: Photovoltaic; Photoconductive (Photo resistors).
			Accelerometer: Definition; General Construction; Working Principle; Types of Accelerometers.
JANUARY	5th	2P	

			Unit-4 Force, Torque, Tactile Different types of load cells and their application, Piezoelectric transducer, Torque measurement: Tactile sensors: Types, construction and working
FEBRUARY	6th	3P	principle of Tactile sensors. magnetic, Piezoelectric, Photoelectric, capacitive and ultrasonic methods, Manometer, elastic elements.
			Revision Chapter-3 & 4
			Class Test-2
	7th	3P	Unit-5 Strain Gauges: Working principle; construction; poisson's ratio; Gauge factor, Piezo resistance Co- efficient; strain sensing alloys;
			characteristics; gauges length, rosettes. Types of Strain Gauge: Bonded; Unbonded; Metallic; Semiconductor.
			Strain Gauge Measurement: Wheatstone bridge measurement; Advantage between full bridge, half bridge and quarter bridge; ppm; disadvantage of. bridge circuit
	8th	3P	linearity error; lead error, bridge constant; temperature compensation; practical implementation of strain gauge (Installation method).
			1 ST INTERNAL ASSESSMENT
			1 ST INTERNAL ASSESSMENT
	9th	3P	Unit-6 Pressure sensor: Few Definitions on pressure; static, head, dynamic pressure. Classification of pressure;
			Pressure Measurement method: Manometric: U Tube manometer,
			well type; inclined tube manometer; dead weight; electric strain method.
MARCH	10th	1P	Revision Chapter- 5 & 6
	11th	3P	Class Test-3
			Mechanical pressure measuring elements: Bourden tube: Types – C Type; Spiral; Helical; Twisted; Bellows; Diaphragm. Design and construction of different types of pressure sensing elements
	12th	3P	Application of Diaphragm: Capacitance Type, Reluctance Type, Strain Gauge Type and Inductive Type. Application of Bellows.
			Unit-7 Temperature sensor: Mechanical and Resistance type temperature sensors, Thermocouples, Thermistor, Optical pyrometer. Continued..... Temperature sensor: Mechanical and Resistance type temperature sensors, Thermocouples, Thermistor, Optical pyrometer.
	13th	2P	2 ND INTERNAL ASSESSMENT
			2 ND INTERNAL ASSESSMENT
	APRIL	14th	3P
Revision Chapter-7 & 8			
Class Test-4			
15th		2P	Revision & Previous year question & answer discussion Revision & Previous year question & answer discussion

Signature
 22/12/2021