

BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, CUTTACK

Lesson Plan of Sidharth Sekhar Mallick, Lecturer in AE&I

Session-2023-2024

(5th Sem.)Industrial Measurement and Instrumentation-II

VISION & MISSION OF APPLIED ELECTRONICS & INSTRUMENTATION ENGINEERING DEPARTMENT

VISION OF THE DEPARTMENT:-

To produce efficient professional in applied electronics & instrumentation engineering and other allied area's with update technical knowledge to meet the challenges of society in relevant sector.

MISSION OF THE DEPARTMENT:-

- To provide the student competent in applied electronics and instrumentation engineering with societal, environmental and human values through quality education, training.
- Provide knowledge of basic science, applied mathematics, instrumentation technology and communicative skills to identify and solve problems related to Applied Electronics and Instrumentation engineering.
- To enable the students to acquire various parameter measurement and automatic control technology used for industrial automation and inculcate quality of leadership, mentorship & teamwork in collaboration with parents, alumni & industry.

PROGRAMME EDUCATIONAL OBJECTIVES:

- To provide students with a solid foundation in basic science, electrical, electronics, instrumentation and interdisciplinary subjects that is necessary to excel in professional career, entrepreneur in future and/or higher education.
- To prepare students to meet the needs and face the challenges of real life as well as industry automation and digitalization in terms of technical, economic and social feasibility.
- To inculcate professionalism, communication skills, attitudes, team work and to adapt to the current trends by engaging in lifelong learning.
- To utilize the technology in domestic, medical, industry and community for proper utilization of instrument for measurement & control.

Discipline: Applied Electronics & Instrumentation Engineering.	Semester : 5 TH		Name of the teaching faculty: Sidharth Sekhar Mallick
Subject: Industrial Measurement & Instrumentation-II	No. of Days/per week class allotted: 04 periods/per week (MON,TUE ,WED & SAT:- 1 Period each)		Semester From Date:- 01-07-2024 To Date:- 08-11-2024 No. of weeks: 18 weeks
Week	Date	No. of period available	Theory Topics
1 st	01/07/2024	01	Introduction, syllabus discussion and define the vision, mission, PEOS of the department
	02/07/2024	01	Chapter-1 Measurement of Stress and Strain 1.1 Define Stress and Strain. 1.2 Explain different types of sensor and Transducers to convert stress and strain converted electrical Voltage.
	03/07/2024	01	1.3 Define strain and classify strain gauge. 1.4 Explain theory of operation of Resistive strain Gauge.
	04/07/2024	01	1.5 Explain the concept multi-axial strain measurement by Rosette Gauge. 1.6 Selection criteria strain gauge material and bonding material Techniques.
	05/07/2024	01	1.7 Concept of semiconductor strain Gauge.
	06/07/2024	01	1.8 Strain Gauge auxiliary circuit (Wheatstone bridge method) 1.9 Effect of change of temperature of strain gauge operation.
2 nd	08/07/2024	01	1.10 Explain the operation instrument for static and dynamic strain gauge measurement.
	09/07/2024	01	1.11 Give some application of strain gauge.
	10/07/2024	01	Chapter-2. Measurement of Distance and Velocity 2.1 Define Velocity and Distance.
	11/07/2024	01	2.2 Potentiometric Displacement Transducer performance Characteristics.
	12/07/2024	01	2.3 Linear variable Differential Transducer (L.V.D.T) Performance, Characteristics and application.
	13/07/2024	01	2.4 Capacitive type Transducer and its signal conditioning circuit.
3 rd	15/07/2024	01	2.5 Piezo electronic crystal circuit equivalent capacitor piezo electric type displacement transducer.
	16/07/2024	01	2.6 Measurement of velocity.
	18/07/2024	01	2.7 calibration Method of velocity (RMM measuring)
	19/07/2024	01	Revision on Chapter 1 & 2
	20/07/2024	01	Class Test-1
4 th	22/07/2024	01	Chapter-3 Measurement of Density and Viscosity 3.1 Define Viscosity and Density.
	23/07/2024	01	3.2 Explain different units viscosity and density.

	24/07/2024	01	3.3 Explain different type's density sensor and viscosity sensor.
	25/07/2024	01	3.4 Explain the function of hygrometer and hydraulic head type densitometer and chain balance densitometer.
	26/07/2024	01	3.5 Explain the measurement of density of slurry type of fluid.
	27/07/2024	01	3.6 U Tube density gauge.
5 th	29/07/2024	01	3.7 Radiation type densitometer.
	30/07/2024	01	3.8 Gas density detector
	31/07/2024	01	3.9 Electrometer magnetic suspension type gas densitometer.
	01/08/2024	01	3.10 Orifice gas density meter
	02/08/2024	01	3.11 Measurement of specific gravity of glass.
	03/08/2024	01	3.12 Explain various method viscosity measurements.
6 th	05/08/2024	01	3.13 Explain the function of orest ward apparatus.
	06/08/2024	01	3.14 Define Co-efficient of viscosity and explain different types viscosity co-efficient and Stoke's Law.
	07/08/2024	01	3.15 Distinguish between Newtonian and Non-Newtonian method.
	08/08/2024	01	3.16. Explain function two flow viscosity, Torque viscosity and side volt viscosity.
	09/08/2024	01	Chapter-4 Measurement of Humidity and Moisture 4.1 Define Moisture and Humidity.
	10/08/2024	01	4.2 Define absolute relative specific humidity and Dew point.
7 th	12/08/2024	01	4.3 Classified difference types humidity measuring instrument (Hydrometer, Pychrometer).
	13/08/2024	01	4.4 Explain the function Humidity measurement by using Hair, Electrical type hygrometer (Resistive, capacitive and crystal Hygrometer)
	14/08/2024	01	4.4 Explain the function Electrical type hygrometer (Resistive, capacitive and crystal Hygrometer)
	16/08/2024	01	4.5 Explain the difference type Phychrometer.
	17/08/2024	01	4.6 Define Dew point and Explain Dew point measurement Techniques
8 th	20/08/2024	01	4.7 Distinguish between Humidity measurements.
	21/08/2024	01	4.8 Infrared Techniques Humidity measurement.
	24/08/2024	01	4.9 Explain conductive and dielectric type moisture meter.
9 th	27/08/2024	01	Revision on chapter-3 &4
	28/08/2024	01	Class Test-2
	31/08/2024	01	Chapter-5 PH value of different solution 5.1 Define PH value of solution and hydrogen Ion concentration.
10 th	02/09/2024	01	5.2 Explain PH Scale.
	03/09/2024	01	5.3 Explain the different types of electrode (PH sensor Hydrogen electrode, Continued...
	04/09/2024	01	5.3 Explain the different types of electrode (PH sensor Calomel electrode, Glass electrode for PH measurement).

	07/09/2024	01	5.4 Explain electrical Method PH measurement.
11 th	09/09/2024	01	5.5 Explain PH measurement Techniques by using Glass electrode.
	10/09/2024	01	Internal Assessment
	11/09/2024	01	Internal Assessment
	14/09/2024	01	Chapter-6 Speed and Acceleration 6.1 Different sped measurement process.
12 th	17/09/2024	01	6.2 Explain the function various types Tachometer (Mechanical type, Electrical type).
	18/09/2024	01	6.3 Explain the non-contact method speed measurement by using optical method such as Stroboscope.
	21/09/2024	01	6.4 Electrical type Tachometer Eddy current, Electro-generator type.
13 th	23/09/2024	01	6.4 Electrical type Tachometer Digital Tachometer, contact type Tachometer.
	24/09/2024	01	6.5 Mechanical type Tachometer –Centrifugal force type Tachometer, Revolution type and Resonance type.
	25/09/2024	01	6.6 Define Tachometer and distinguish between AC and DC Tachometer.
	28/09/2024	01	6.7 General purpose acceleration (Piezo electric and Strain Gauge type.).
14 th	30/09/2024	01	Revision on chapter- 5 & 6
	01/10/2024	01	Class Test-3
	05/10/2024	01	Chapter-7 Virtual Instrument 7.1 Introduction of VI and architecture.
15 th	14/10/2024	01	7.2 Block diagram and front panel of VI
	15/10/2024	01	7.3 Explain Front panel different parameters of VI.
	19/10/2024	01	7.4 Explain array, structure and cluster.
16 th	21/10/2024	01	7.5 Instrument drive.
	22/10/2024	01	Chapter-8 Gas Analyzer 8.1 Explain the principal of Gas analyzer
	23/10/2024	01	8.2 Describe the function of In-farad and oxygen gas.
	26/10/2024	01	8.3 Explain the measurement techniques gas constitutions by Thermal conductivity method
17 th	28/10/2024	01	Revision on chapter- 7 & 8
	29/10/2024	01	Class Test-4
	30/10/2024	01	Quiz test on all unit
	02/11/2024	01	Revision and important question discussion on unit-1 & 2
18 th	04/11/2024	01	Revision and important question discussion on unit-3 & 4
	05/11/2024	01	Revision and important question discussion on unit-5 & 6
	06/11/2024	01	Revision and important question discussion on unit-7 & 8