IM1-11

BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, CUTTACK

Lesson Plan of Sidharth Sekhar Mallick, Lecturer AE&I

Session-2022-2023

VISION & MISSION OF APPLIED ELECTRONICS & INSTRUMENTATION ENGINEERING DEPARTMENT

VISION OF THEDEPARTMENT:-

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 :** 5TH	**Name of the teaching faculty:** Sidharth Sekhar Mallick
Subject: Industrial Measurement & Instrumentation-II	No. of Days/per week class allotted: **04 periods/per week (TUE ,WED , FRI & SAT:- 1 Period each)**	Semester From Date:- 15-09-2022 To Date:- 22-12-2022 No. of weeks: 15 weeks
Week	**Class Day**	**Theory Topics**
1st	16/09/2022	Introduction, syllabus discussion and define the vision, mission, PEOS of the department
	17/09/2022	**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.
2nd	20/09/2022	1.3 Define strain and classify strain gauge. 1.4 Explain theory of operation of Resistive strain Gauge.
	21/09/2022	1.5 Explain the concept multi-axial strain measurement by Rosette Gauge. 1.6 Selection criteria strain gauge material and bonding material Techniques.
	23/09/2022	1.7 Concept of semiconductor strain Gauge. 1.8 Strain Gauge auxiliary circuit (Wheatstone bridge method)
	24/09/2022	1.9 Effect of change of temperature of strain gauge operation. 1.10 Explain the operation instrument for static and dynamic strain gauge measurement. 1.11 Give some application of strain gauge.
3rd	27/09/2022	**Chapter-2.** Measurement of Distance and Velocity 2.1 Define Velocity and Distance. 2.2 Potentiometric Displacement Transducer performance Characteristics.
	28/09/2022	2.3 Linear variable Differential Transducer (L.V.D.T) Performance ,

		Characteristics and application. 2.4 Capacitive type Transducer and its signal conditioning circuit.
	30/10/2022	2.5 Piezo electronic crystal circuit equivalent capacitor piezo electric type displacement transducer
	01/10/2022	2.6 Measurement of velocity. 2.7 calibration Method of velocity (RMM measuring)
4th	04/10/2022	**DURGA PUJA HOLIDAY**
	05/10/2022	
	07/10/2022	
	08/10/2022	
5th	11/10/2022	**Revision on Chapter 1 & 2**
	12/10/2022	**Class Test-1**
	14/10/2022	**Chapter-3** Measurement of Density and Viscosity 3.1 Define Viscosity and Density. 3.2 Explain different units viscosity and density.3.3 Explain different types density sensor and viscosity sensor..
	15/10/2022	3.4 Explain the function of hygrometer and hydraulic head type densitometer and chain balance densitometer.
6th	18/10/2022	3.5 Explain the measurement of density of slurry type of fluid. 3.6 U Tube density gauge.
	19/10/2022	3.7 Radiation type densitometer. 3.8 Gas density detector
	21/10/2022	3.9 Electrometer magnetic suspension type gas densitometer 3.10 Orifice gas density meter
	22/10/2022	3.11 Measurement of specific gravity of glass.
7th	25/10/2022	3.12 Explain various method viscosity measurements.
	26/10/2022	3.13 Explain the function of osest ward apparatus. 3.14 Define Co-efficient of viscosity and explain different types viscosity co-efficient and Stroke's Law.
	28/10/2022	3.15 Distinguish between Newtonian and Non-Newtonian method.
	29/10/2022	3.16. Explain function two flow viscosity, Torque viscosity and side volt viscosity.

8th	01/11/2022	**Chapter-4** Measurement of Humidity and Moisture 4.1 Define Moisture and Humidity. 4.2 Define absolute relative specific humidity and Dew point.
	02/11/2022	4.3 Classified difference types humidity measuring instrument (Hydrometer, Phychrometer).
	04/11/2022	4.4 Explain the function Humidity measurement by using Hair, Electrical type hygrometer (Resistive, capacitive and crystal Hygrometer)
	05/11/2022	4.5 Explain the difference type Phychrometer.
9th	09/11/2022	4.6 Define Dew point and Explain Dew point measurement Techniques 4.7 Distinguish between Humidity measurements.
	11/11/2022	4.8 Infrared Techniques Humidity measurement. 4.9 Explain conductive and dielectric type moisture meter.
	12/11/2022	**Revision on chapter-3 &4**
10th	15/11/2022	**Class Test-2**
	16/11/2022	**Chapter-5** PH value of different solution 5.1 Define PH value of solution and hydrogen Ion concentration. 5.2 Explain PH Scale. 5.3 Explain the different types of electrode (PH sensor Hydrogen electrode, Continued...
	18/11/2022	5.4 Explain electrical Method PH measurement. 5.5 Explain PH measurement Techniques by using Glass electrode.
	19/11/2022	**Chapter-6** Speed and Acceleration 6.1 Different sped measurement process. 6.2 Explain the function various types Tachometer (Mechanical type, Electrical type).
11th	22/11/2022	6.3 Explain the non-contact method speed measurement by using optical method such as Stroboscope.
	23/11/2022	6.4 Electrical type Tachometer Eddy current, Electro-generator type, Digital Tachometer, contact type Tachometer.
	25/11/2022	6.5 Mechanical type Tachometer –Centrifugal force type

		Tachometer, Revolution type and Resonance type.
	26/11/2022	6.6 Define Tachometer and distinguish between AC and DC Tachometer.
12th	29/11/2022	**INTERNAL ASSESSMENT**
	30/11/2022	**INTERNAL ASSESSMENT**
	02/12/2022	6.7 General purpose acceleration (Piezo electric and Strain Gauge type.).
	03/12/2022	**Revision on chapter- 5 & 6**
13th	06/12/2022	**Class Test-3**
	07/12/2022	**Chapter-7** Virtual Instrument 7.1 Introduction of VI and architecture. 7.2 Block diagram and front panel of VI
	09/12/2022	7.3 Explain Front panel different parameters of VI.
	10/12/2022	7.4 Explain array, structure and cluster. 7.5 Instrument drive.
14th	13/12/2022	**Chapter-8** Gas Analyzer 8.1 Explain the principal of Gas analyzer.
	14/12/2022	8.2 Describe the function of In-farad and oxygen gas. 8.3 Explain the measurement techniques gas constitutions by Thermal conductivity method
	16/12/2022	**Revision on chapter- 7 & 8**
	17/12/2022	**Class Test-4**
15th	20/12/2022	Quiz test on chapter- 1,2,3,4,5,6,7&8
	21/12/2022	Revision and important question discussion on unit-1, 2, 3, 4,5,6,7&8