

# Government Polytechnic Nayagarh

**Lesson Plan:** Electrical Measurement & Instrumentation

**Faculty Name:** Samir Kumar Sethi

**Course Duration:** 14.02.2023 To 24.06.2023

**Branch:** Electrical Engineering

**Session-2022-23**

Semester=4<sup>Th</sup>

Periods	Topic	Course Content In Terms Of Specific Objectives
1	Measuring instruments	Define Accuracy, precision, Errors, Resolutions Sensitivity and tolerance
2		Classification of Measuring Instrument
3		Explain Deflecting, controlling and damping arrangements in indicating type of instruments.
4		Calibration of instruments.
5		Question answer and concept of errors
6	Analog Ammeters And Voltmeters	Describe Construction, principle of operation of moving iron type of instrument
7		Derivation of torque ,errors, merits and demerits of moving iron type of instrument.
8		Describe Construction, principle of operation of PMMC
9		Derivation of torque ,errors, merits and demerits of PMMC
10		Describe Construction, principle of operation of Dynamometer type instruments
11		Derivation of torque ,errors, merits and demerits of Dynamometer type instruments .Difference between PMMC and Dynamometer type instrument
12		Describe Construction, principle of operation of Rectifier type of instruments.
13		Describe Construction, principle of operation of Induction type of Instrument type of instruments.
14		Merits and demerits of moving induction type of instrument.
15		Extend the range of instruments by use of shunts and Multipliers.
16		Solve Numerical
17	Wattcmeters And Measurement Of Power	Describe Construction, principle of working of Dynamometer type wattmeter
18		LPF type wattmeter
19		UPF type wattmeter
20		The Errors in Dynamometer type wattmeter
21		Methods of correction of errors
		-Do-
22		Induction type of wattmeter, construction and working principle
23	Calculation of torque and phasor diagram	
25	Energymeters and Measurement of energy	Introduction of energy meter .Defination of energy meter.
26		Construction and working of energy meter .
27		Mathematical analysis with phasor diagram
28		Compensation and adjustment of single phase energy meter.
29		Testing of energy meter
30		-Do-

31		-Do-
32		-Do-
33	Measurement Of Speed, Frequency And Power Factor	Tachometers, types and working principles
34		-Do-
35		Principle of operation and construction of Mechanical and Electrical resonance Type frequency meters.
36		-Do-
37		-Do-
38		Principle of operation and working of Dynamometer type single phase and three phase power factor meters.
39		-Do-
40		Measurement Of Resistance, Inductance & Capacitance
41	Measurement of low resistance by potentiometer method.	
42	Measurement of medium resistance by wheat Stone bridge method	
43	Measurement of high resistance by loss of charge method	
44	Construction, principle of operations of Megger & Earth tester for insulation resistance and earth resistance measurement respectively.	
45	Construction and principles of Multimeter. (Analog and Digital)	
46	Measurement of inductance by Maxewell's Bridge method	
47	Measurement of capacitance by Schering Bridge method	
48	Sensors And Transducer	Define Transducer, sensing element or detector element and transduction elements.
49		Classify transducer. Give examples of various class of transducer. Application in various field .
50		Linear and angular motion potentiometer ,Thermistor and Resistance thermometers
51		Wire Resistance Strain Gauges
52		Principle of linear variable differential Transformer (LVDT) and use of it
53		General principle of capacitive transducer. Variable area capacitive transducer.
54		Change in distance between plate capacitive transducer
55		Piezo electric Transducer
56		Hall Effect Transducer with their applications
57	Oscilloscope	Principle of operation of Cathode Ray Tube
58		Principle of operation of Oscilloscope (with help of block diagram).
59		Measurement of DC Voltage & current
60		Measurement of AC Voltage, current, phase & frequency.

Samir Kumar Saha

Signature of Faculty

Signature of HOD