

# Lesson Plan of Electrical Measurement & Instrumentation

Discipline: Electrical Engineering	Semester:-4 <sup>th</sup>	Name Of The Teaching Faculty:-SMRUTIREKHA MOHANTY
Subject:- Electrical Measurement & Instrumentation	No. Of Days/Week Class Allotted:-5	No. Of Weeks:-15 DATE- 04-02-2025 to 17-05-2025
Week	No. Of Class	Topic To Be Taught
1 <sup>st</sup>	1 <sup>st</sup>	Define accuracy, precision, errors, resolutions sensitivity and tolerance..
	2 <sup>nd</sup>	Classification of measuring instruments..
	3 <sup>rd</sup>	Explain deflecting, controlling and damping arrangements in indicating type of instruments.
	4 <sup>th</sup>	calibration of instruments
	5 <sup>th</sup>	Revision of previously taught topic and doubt clearing
2 <sup>nd</sup>	1 <sup>st</sup>	Introduction to analog ammeters and voltmeters
	2 <sup>nd</sup>	Describe construction, principle of operation, errors, ranges merits and demerits of: Moving iron type instruments.
	3 <sup>rd</sup>	Permanent magnet moving coil type instruments..
	4 <sup>th</sup>	Pmmc.
	5 <sup>th</sup>	Revision of previously taught topic and doubt clearing
3 <sup>rd</sup>	1 <sup>st</sup>	Dynamometer type instruments
	2 <sup>nd</sup>	Continue emmc
	3 <sup>rd</sup>	Rectifier type instruments
	4 <sup>th</sup>	Rectifier type instruments
	5 <sup>th</sup>	Revision of previously taught topic and doubt clearing
4 <sup>th</sup>	1 <sup>st</sup>	Induction type instruments
	2 <sup>nd</sup>	Induction type instruments
	3 <sup>rd</sup>	Extend the range of instruments by use of shunts and multipliers.
	4 <sup>th</sup>	Solve numerical
	5 <sup>th</sup>	Problem solve
5 <sup>th</sup>	1 <sup>st</sup>	Introduction to wattmeters and measurement of power
	2 <sup>nd</sup>	Describe construction, principle of working of dynamometer type wattmeter. (lpf type)
	3 <sup>rd</sup>	Describe construction, principle of working of dynamometer type wattmeter. (upf type)
	4 <sup>th</sup>	The errors in dynamometer type wattmeter..
	5 <sup>th</sup>	Revision
6 <sup>th</sup>	1 <sup>st</sup>	Methods of their correction
	2 <sup>nd</sup>	Discuss induction type watt meters.
	3 <sup>rd</sup>	Induction type wattmeter
	4 <sup>th</sup>	Numerical solve

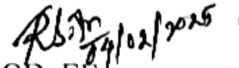
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	5 <sup>th</sup>	Energy meters and measurement of energy
7 <sup>th</sup>	1 <sup>st</sup>	introduction.
	2 <sup>nd</sup>	Single phase induction type energy meters – construction, working principle.
	3 <sup>rd</sup>	Compensation & adjustments.
	4 <sup>th</sup>	Continue single phase induction type energy meters
	5 <sup>th</sup>	Problem discussion
8 <sup>th</sup>	1 <sup>st</sup>	Continue single phase induction type energy meters
	2 <sup>nd</sup>	Continue single phase induction type energy meters
	3 <sup>rd</sup>	Testing of energy meters.
	4 <sup>th</sup>	Continue testing of energy meters.
	5 <sup>th</sup>	Doubt clearing classes
9 <sup>th</sup>	1 <sup>st</sup>	Measurement of speed, frequency and power factor
	2 <sup>nd</sup>	tachometers
	3 <sup>rd</sup>	Types and working principles of tachometer
	4 <sup>th</sup>	Principle of operation and construction of mechanical type frequency meters
	5 <sup>th</sup>	Revision of previous topic
10 <sup>th</sup>	1 <sup>st</sup>	Principle of operation and construction of electrical type frequency meters
	2 <sup>nd</sup>	Principle of operation and construction of mechanical type frequency meters
	3 <sup>rd</sup>	Principle of operation and working of dynamometer type single phase power factor meters.
	4 <sup>th</sup>	Principle of operation and working of dynamometer type three phase power factor meters.
	5 <sup>th</sup>	Brief discussion of previous chapter
11 <sup>th</sup>	1 <sup>st</sup>	Measurement of resistance, inductance & capacitance Classification of resistance
	2 <sup>nd</sup>	Measurement of low resistance by potentiometer method. .
	3 <sup>rd</sup>	Measurement of medium resistance by wheat stone bridge method.
	4 <sup>th</sup>	Measurement of high resistance by loss of charge method.
	5 <sup>th</sup>	Problem solve
12 <sup>th</sup>	1 <sup>st</sup>	Construction, principle of operations of megger & earth tester for insulation resistance and earth resistance measurement respectively.
	2 <sup>nd</sup>	Construction and principles of multimeter. (analog and digital)
	3 <sup>rd</sup>	Measurement of inductance by maxewell's bridge method.
	4 <sup>th</sup>	Measurement of capacitance by schering bridge method
	5 <sup>th</sup>	Problem solve
13 <sup>th</sup>	1 <sup>st</sup>	Sensors and transducer

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		Define transducer, sensing element or detector element and transduction elements. Classify transducer. Give examples of various class of transducer.
	2 <sup>nd</sup>	Resistive transducer
	3 <sup>rd</sup>	Linear and angular motion potentiometer
	4 <sup>th</sup>	Thermistor and resistance thermometers
	5 <sup>th</sup>	Wire resistance strain gauges
14 <sup>th</sup>	1 <sup>st</sup>	Inductive transducer Principle of linear variable differential transformer (lvdt) uses of LVDT
	2 <sup>nd</sup>	Capacitive transducer. General principle of capacitive transducer
	3 <sup>rd</sup>	Variable area capacitive transducer. Change in distance between plate capacitive transducer.
	4 <sup>th</sup>	Piezo electric transducer and hall effect transducer with their applications
	5 <sup>th</sup>	Revision of previous topic
15 <sup>th</sup>	1 <sup>st</sup>	Oscilloscope Introduction
	2 <sup>nd</sup>	Principle of operation of cathode ray tube.
	3 <sup>rd</sup>	Principle of operation of oscilloscope (with help of block diagram).
	4 <sup>th</sup>	Measurement of dc voltage & current
	5 <sup>th</sup>	Measurement of ac voltage, current, phase & frequency

  
 Teaching Faculty

  
 HOD, EE