

# LESSON PLAN

<b>Discipline:</b> Elect. Engg.	<b>Semester:</b> Fifth (5 <sup>th</sup> )	<b>Name of the Faculty:</b> PRAJNADIPTA SAHOO
<b>Subject:</b> Utilization of Electrical Energy & Traction	<b>No. of days/week class allotted:</b> Five (5)	<b>No. of Weeks:</b> 15
<b>WEEK</b>	<b>CLASS DAY</b>	<b>THEORY TOPICS</b>
1 <sup>st</sup>	1 <sup>st</sup>	Definition and Basic Principle of electro deposition, Important terms regarding electrolysis
	2 <sup>nd</sup>	Laws of electrolysis
	3 <sup>rd</sup>	Faradays Definition of Current efficiency, energy efficiency
	4 <sup>th</sup>	principle of electro deposition
	5 <sup>th</sup>	Factors affecting the amount of electro deposition
2 <sup>nd</sup>	1 <sup>st</sup>	Factors affecting the amount of electro deposition Factors governing the Better electro- deposition
	2 <sup>nd</sup>	State simple Examples of extraction of metals
	3 <sup>rd</sup>	State simple Examples of extraction of metals (Cont...)
	4 <sup>th</sup>	Application of electrolysis
	5 <sup>th</sup>	<b>Review Class</b>
3 <sup>rd</sup>	1 <sup>st</sup>	Advantage of electrical heating
	2 <sup>nd</sup>	Explain Mode of heat transfer & stephens law
	3 <sup>rd</sup>	Discuss principle of resistance heating(direct)
	4 <sup>th</sup>	Discuss principle of resistance heating(indirect)
	5 <sup>th</sup>	Explain working principle of direct arc furnace and indirect arc furnace
4 <sup>th</sup>	1 <sup>st</sup>	principle of induction heating
	2 <sup>nd</sup>	Working principle of direct core type, vertical core type & indirect core type induction furnace
	3 <sup>rd</sup>	principle of coreless induction furnace & skin effect

	4 <sup>th</sup>	principle of dielectric heating & its application
	5 <sup>th</sup>	<b>Monthly test</b>
5 <sup>th</sup>	1 <sup>st</sup>	principle of microwave heating & its application
	2 <sup>nd</sup>	<b>Review Class</b>
	3 <sup>rd</sup>	Explain Principle Of arc welding
	4 <sup>th</sup>	Discuss DC arc phenomena
	5 <sup>th</sup>	Discuss AC arc phenomena
6 <sup>th</sup>	1 <sup>st</sup>	DC arc welding plants of single and multi operation type
	2 <sup>nd</sup>	AC arc welding plants of single and multi operation type
	3 <sup>rd</sup>	Types of arc welding
	4 <sup>th</sup>	Explain Principle of resistance welding
	5 <sup>th</sup>	Descriptive Study of different resistance welding methods
7 <sup>th</sup>	1 <sup>st</sup>	<b>Review Class</b>
	2 <sup>nd</sup>	Nature of radiation and its spectrum
	3 <sup>rd</sup>	Terms used in illuminations. Luminous intensity, lumen and intensity of illumination
	4 <sup>th</sup>	MHCP,MSCP,MHSCP
	5 <sup>th</sup>	<b>Monthly test</b>
8 <sup>th</sup>	1 <sup>st</sup>	Brightness, solid angle and luminous efficiency
	2 <sup>nd</sup>	Explain the inverse square law and the cosine law
	3 <sup>rd</sup>	Explain polar curves
	4 <sup>th</sup>	Describe Light distribution and control. Explain related definitions like maintenance factor and depreciation factor
	5 <sup>th</sup>	Design Simple lighting schemes and depreciation factor

9 <sup>th</sup>	1 <sup>st</sup>	Constructional features and working of Filament lamps , effect of variation of voltage on working of filament lamps.
	2 <sup>nd</sup>	Explain discharge lamps.
	3 <sup>rd</sup>	State Basic idea about excitation in gas discharge lamps
	4 <sup>th</sup>	State constructional features and operation of fluorescent lamp(PL and PLL lamps)
	5 <sup>th</sup>	Sodium vapor lamps High pressure mercury vapor lamps
10 <sup>th</sup>	1 <sup>st</sup>	Neon sign Lamps
	2 <sup>nd</sup>	High lumen output and low consumption F.L
	3 <sup>rd</sup>	<b>Review Class</b>
	4 <sup>th</sup>	<b>Monthly test</b>
	5 <sup>th</sup>	State Group drive & individual drive
11 <sup>th</sup>	1 <sup>st</sup>	Method of Choice of electric drives
	2 <sup>nd</sup>	Explain Starting & running characteristics of DC motor
	3 <sup>rd</sup>	Starting & running characteristics of AC motor
	4 <sup>th</sup>	State Application of DC motor
	5 <sup>th</sup>	State Application of 3phase induction motor
12 <sup>th</sup>	1 <sup>st</sup>	Application of 3phase synchronous ,1phase induction motor, series motor, universal motor , repulsion motor.
	2 <sup>nd</sup>	<b>Review Class</b>
	3 <sup>rd</sup>	Explain System of traction

	4 <sup>th</sup>	System of track electrification
	5 <sup>th</sup>	Running characteristics of DC and AC traction motor
13 <sup>th</sup>	1 <sup>st</sup>	Explain control of motor Tapped field control
	2 <sup>nd</sup>	Rheostat control
	3 <sup>rd</sup>	Series parallel control
	4 <sup>th</sup>	Multi-unit Control
	5 <sup>th</sup>	Metadyne control
14 <sup>th</sup>	1 <sup>st</sup>	Explain Breaking of the following types  Regenerative Breaking
	2 <sup>nd</sup>	Breaking with 1-ph series motor
	3 <sup>rd</sup>	Magnetic Breaking
	4 <sup>th</sup>	<b>Review Class</b>
	5 <sup>th</sup>	<b>Monthly test</b>
15 <sup>th</sup>	1 <sup>st</sup>	revision
	2 <sup>nd</sup>	revision
	3 <sup>rd</sup>	revision
	4 <sup>th</sup>	revision
	5 <sup>th</sup>	revision

