

LESSON PLAN

Name of Faculty: Sri Sushanta Kumar Malik, Senior lecturer

Subject: Renewable Energy Power Plants (REPP)(EEPC209) TH-5

Semester: 3rd

Branch : Electrical Engineering

No of period: 45 (3hr /week)

W.E.F :- 01.07.2026

Week	Period	Topic To Be Covered	Teaching aid to be used
1		UNIT-I: Solar PV and Concentrated Solar Power Plants	
	1	Solar Map of India: Global solar power radiation	Smart Class (Interactive Panel)
	2	Solar PV Concentrated Solar Power(CSP) plants	Smart Class (Interactive Panel)
	3	Construction and working of: Power Tower	Smart Class (Interactive Panel)
2	4	Construction and working of: Parabolic Trough, Parabolic Dish	Smart Class (Interactive Panel)
	5	Construction and working of: Fresnel Reflectors	White board, marker
	6	Solar Photovoltaic (PV) power plant: components layout	Smart Class (Interactive Panel)
3	7	Construction, working of Solar Photovoltaic (PV) power plant	Smart Class (Interactive Panel)
	8	construction, working of Roof top solar PV power system	Smart Class (Interactive Panel)
		UNIT-II : Large Wind Power Plants	
4	9	Components, layout and working of Geared type wind power plants	Smart Class (Interactive Panel)
	10	Components, layout and working of Geared type wind power plants	Smart Class (Interactive Panel)
	11	Components, layout and working of Direct drive type wind power plants	Smart Class (Interactive Panel)
	12	Components, layout and working of Direct drive type wind power plants	Smart Class (Interactive Panel)
5	13	Constant Speed Electric Generators: Squirrel Cage Induction Generators(SCIG): Construction and working	Smart Class (Interactive Panel)
	14	Constant Speed Electric Generators: Squirrel Cage Induction Generators(SCIG): Construction and working	Smart Class (Interactive Panel)
	15	Wound Rotor Induction Generator (WRIG): Construction and working	Smart Class (Interactive Panel)
6	16	Variable Speed Electric Generators: Doubly-fed induction generator(DFIG): Construction and working	Smart Class (Interactive Panel)
	17	Variable Speed Electric Generators: Doubly-fed induction generator(DFIG): Construction and working	Smart Class (Interactive Panel)
	18	Wound rotor synchronous generator(WRSG): Construction and working	Smart Class (Interactive Panel)
7	19	Wound rotor synchronous generator(WRSG): Construction and working	Smart Class (Interactive Panel)
	20	permanent magnet synchronous generator(PMSG): Construction and working	Smart Class (Interactive Panel)
		UNIT-III: Small Wind Turbines	
8	21	Horizontal axis small wind turbine: direct drive type, components and working	Smart Class (Interactive Panel)
	22	Horizontal axis small wind turbine: direct drive type, components and working	Smart Class (Interactive Panel)
	23	Horizontal axis small wind turbine: geared type, components and working	Smart Class (Interactive Panel)
	24	Horizontal axis small wind turbine: geared type, components and working	Smart Class (Interactive Panel)
9	25	Vertical axis small wind turbine: direct drive and geared, components and Working	Smart Class (Interactive Panel)
	26	Vertical axis small wind turbine: direct drive and geared, components and Working	Smart Class (Interactive Panel)

	27	Types of towers and installation of small wind turbines on rooftops and open fields.	White board, marker
10	28	Types of towers and installation of small wind turbines on rooftops and open fields.	White board, marker
	29	Electric generators used in small wind power plants	White board, marker
		UNIT-IV: Biomass-based Power Plants	
	30	Properties of solid fuel for biomass power plants: Bagasse, wood chips	White board, marker
11	31	Properties of solid fuel for biomass power plants: rice husk, municipal waste	White board, marker
	32	Properties of liquid and gaseous fuel for biomass power plants: Jatropha	White board, marker
	33	Properties of liquid and gaseous fuel for biomass power plants: bio- diesel gohar gas	White board, marker
12	34	Layout of a Bio-chemical based (e.g. biogas) power plant	Smart Class (Interactive Panel)
	35	Layout of a Bio-chemical based (e.g. biogas) power plant	Smart Class (Interactive Panel)
	36	Layout of a Thermo-chemical based (e.g. Municipal waste) power plant	Smart Class (Interactive Panel)
13	37	Layout of a Thermo-chemical based (e.g. Municipal waste) power plant	Smart Class (Interactive Panel)
	38	Layout of a Agro-chemical based (e.g. bio-diesel) power plant	Smart Class (Interactive Panel)
	39	Layout of a Agro-chemical based (e.g. bio-diesel) power plant	Smart Class (Interactive Panel)
14	40	Revision 1	White board, marker
	41	Revision 2	White board, marker
	42	Revision 3	White board, marker
15	43	Revision 4	White board, marker
	44	Revision 5	White board, marker
	45	Revision 6	White board, marker

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 9/10/2024
 HOD (ELECT)

LESSON PLAN

Name of Faculty: Sri Sushanta Kumar Malik, Senior lecturer

Subject: Introduction to Electrical Generation System (IEGS)(EEPC201) TH-1

Semester: 3rd

Branch : Electrical Engineering

No of period: 45 (3hr /week)

W.E.F :-01.07.2026

Week	Period	Topic To Be Covered	Teaching aid to be used
1		UNIT-I: Thermal Power Plants: Coal, Gas/Diesel and Nuclear-based	
	1	Layout and working of a typical thermal power plant with steam turbines and electric generators	Smart Class (Interactive Panel)
	2	Layout and working of a typical thermal power plant with steam turbines and electric generators	Smart Class (Interactive Panel)
	3	Properties of conventional fuels used in the energy conversion equipment used in thermal power plants like Coal and Gas	White board, marker
2	4	Properties of conventional fuels used in the energy conversion equipment used in thermal power plants like Diesel	White board, marker
	5	Nuclear fuels-fusion and fission action	White board, marker
	6	Functions of the following types of thermal power plants and their major auxiliaries: Coal fired boilers:	Smart Class (Interactive Panel)
3	7	fire tube and water tube	Smart Class (Interactive Panel)
	8	Gas/diesel based combustion engines	Smart Class (Interactive Panel)
	9	Types of nuclear reactors	Smart Class (Interactive Panel)
4	10	Disposal of nuclear waste	Smart Class (Interactive Panel)
	11	Nuclear shielding	Smart Class (Interactive Panel)
		UNIT-II: Large Hydropower Plants	
5	12	Energy conversion process of hydro power plant	Smart Class (Interactive Panel)
	13	Classification of hydropower plant: High, medium and low head	Smart Class (Interactive Panel)
	14	Description about High, medium and low head	Smart Class (Interactive Panel)
	15	Construction and working of hydro turbines used in different types of hydro power plant:	Smart Class (Interactive Panel)
6	16	1. High head-Pelton turbine	Smart Class (Interactive Panel)
	17	2. Medium head-Francis turbine	Smart Class (Interactive Panel)
	18	3. Low head-Kaplan turbine	Smart Class (Interactive Panel)
7	19	Safe Practices for hydro power plants	Smart Class (Interactive Panel)
		Locations of these different types of large hydropower plants in India	Smart Class (Interactive Panel)
		UNIT-III: Micro-Hydropower Plants	
8	20	Introduction to Micro-Hydropower Plants	White board, marker
	21	Layout of micro hydro power plants	Smart Class (Interactive Panel)
	22	Different types of micro-hydro turbines for different heads:	Smart Class (Interactive Panel)
9	23	1. Pelton turbines	Smart Class (Interactive Panel)
	24	2. Francis turbines	Smart Class (Interactive Panel)
	25	3. Kaplan turbines	Smart Class (Interactive Panel)
10	26	Locations of these different types of micro-hydro power plants in India	White board, marker
		UNIT-IV: Economics of Power Generation and Inter connected Power System	
	27	Define and explain :connected load, firm power, cold reserve	White board, marker
10	28	Define and explain: hot reserve, spinning reserve.	White board, marker
	29	Define and explain :Base load Power Plant	White board, marker
		Define and explain :Peak load Power Plant	White board, marker

	30	Define and explain :Load curve, load duration curve	White board, marker
11	31	Define and explain : integrated duration curve	White board, marker
	32	Cost of generation Define and explain: Average demand, maximum demand	White board, marker
	33	Define and explain: demand factor, plant capacity factor	White board, marker
12	34	Define and explain: plant use factor, diversity factor	White board, marker
	35	Define and explain: load factor and plant load factor	White board, marker
	36	Choice of size and number of generator units	White board, marker
13	37	Combined operation of power station Causes, Impact and reasons of Grid system fault	White board, marker
	38	State grid	Smart Class (Interactive Panel)
	39	National grid	Smart Class (Interactive Panel)
14	40	brown out and blackout	Smart Class (Interactive Panel)
	41	Sample black out sat national	Smart Class (Interactive Panel)
	42	International level	Smart Class (Interactive Panel)
15	43	Revision 1	White board, marker
	44	Revision 2	White board, marker
	45	Revision 3	White board, marker

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01/07/2026

LESSON PLAN

Name of Faculty: Sri Sushanta Kumar Malik, Senior lecturer

Subject: Energy Conservation & Audit (EC&A) TH-2

Semester: 5TH

Branch : Electrical Engineering

No of period: 45 (3hr /week)

W.E.F :- 01.07.2026

Week	Period	Topic To Be Covered	Teaching aid to be used
1		UNIT-I: Energy Conservation Basics	White board, marker
	1	Energy Scenario: Primary and Secondary Energy, Energy demand and supply	White board, marker
	2	National scenario	White board, marker
	3	Energy conservation and Energy audit ; concepts and difference	White board, marker
2	4	Indian Electricity Act2001;relevant clauses of energy conservation	White board, marker
	5	BEE and its Roles, MEDA and its Roles	White board, marker
	6	Star Labelling : Need and its benefits.	White board, marker
3		UNIT-II : Energy Conservation in Electrical Machines	White board, marker
	7	Need for energy conservation in induction motor and transformer	White board, marker
	8	Energy conservation techniques in induction motor by: - Improving Power quality. - Motor survey - Matching motor with loading. - Minimizing the idle and redundant running of motor	White board, marker
	9	- Operating in star mode. - Rewinding of motor. - Replacement by energy efficient motor	White board, marker
4	10	- Periodic maintenance - Energy conservation techniques in Transformer. - Loading sharing - Parallel operation	White board, marker
	11	- Isolating techniques. - Replacement by energy efficient transformers. - Periodic maintenance	White board, marker
	12	Energy Conservation Equipment: Soft starters, Automatic star delta convertor, Variable Frequency Drives	White board, marker
5	13	Automatic p. f. controller (APFC), Intelligent p. f. controller (IPFC)	White board, marker
	14	Energy efficient motor; significant features, advantages, applications and limitations	White board, marker
	15	Energy efficient transformers, amorphous transformers	White board, marker
6	16	epoxy Resin cast transformer / Dry type of transformer.	White board, marker
		UNIT-III: Energy conservation in Electrical Installation systems	White board, marker
	17	Aggregated Technical and commercial losses (ATC); Power system at state, regional, national and global level.	White board, marker

	18	Technical losses; causes and measures to reduce by. a) Controlling I ² R losses. b) Optimizing distribution voltage c) Balancing phase currents d) Compensating reactive power flow	White board, marker
7	19	Commercial losses: pilferage, causes and remedies	White board, marker
	20	Energy conservation equipment: Maximum Demand Controller, kVAR Controller, Automatic Power Factor controller(APFC)	White board, marker
	21	Energy Conservation in Lighting System a) Replacing Lamp sources. b) Using energy efficient luminaries.	White board, marker
8	22	a) Using light controlled gears. b) Installation of separate transformer/servo stabilizer for lighting.	White board, marker
	23	Periodic survey and adequate maintenance programs.	White board, marker
	24	Energy Conservation techniques in fans, Electronic regulators.	White board, marker
9		UNIT-IV: Energy conservation through Cogeneration and Tariff	White board, marker
	25	Co-generation and Tariff; concept, significance for energy conservation	White board, marker
	26	Co-generation Types of cogeneration on basis of sequence of energy use (Topping cycle, Bottoming cycle)	White board, marker
	27	Types of cogeneration basis of technology- Steam turbine cogeneration, Gas turbine cogeneration	White board, marker
10	28	Reciprocating engine cogeneration	White board, marker
	29	Factors governing these lection of cogeneration system	
	30	Advantages of cogeneration	White board, marker
11	31	Tariff: Types of tariff structure: Special tariffs; Time-off-day tariff, Peak-off-day tariff	White board, marker
	32	Power factor tariff, Maximum Demand tariff, Load factor tariff.	White board, marker
	33	Application of tariff system to reduce energy bill.	White board, marker
12		UNIT-V: Energy Audit of Electrical System	White board, marker
	34	Energy audit (definition as per Energy Conservation Act)	White board, marker
	35	Energy audit instruments and their use	White board, marker
	36	Questionnaire for energy audit projects.	White board, marker
13	37	Energy flow diagram (Sankey diagram)	White board, marker
	38	Simple payback period, Energy Audit procedure (walkthrough audit and detailed audit).	White board, marker
	39	Energy Audit report format.	White board, marker
14	40	Revision 1	
	41	Revision 2	
	42	Revision 3	
15	43	Revision 4	
	44	Revision 5	
	45	Revision 6	

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01/07/2026
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