

<b>DISCIPLINE:</b> Electrical & Electronics Engg.	<b>SEMESTER:</b> 3 <sup>RD</sup> Semester	<b>NAME OF THE TEACHING FACULTY:</b> MAJJI LALITHA PTGF IN EEE.
<b>SUBJECT: POWER GENERATION SYSTEMS</b>	<b>NO OF DAYS/PER WEEK CLASSES ALLOTTED:03</b>	<b>SEMESTER FROM DATE: 14.07.2025 TO DATE: 15.11.2025 NO OF WEEKS:15</b>

Week	Class Day	Topics
		<b>1.Thermal Power Plants: Coal, Gas/Diesel and Nuclear-based</b>
<b>1<sup>ST</sup></b>	1 <sup>ST</sup>	Layout and working of a typical thermal power plant with steam turbines and electric generators
	2 <sup>ND</sup>	Properties of conventional fuels used in the energy conversion equipment used in thermal power plants:a) Coal.
	3 <sup>RD</sup>	Properties of conventional fuels used in the energy conversion equipment used in thermal power plants:b) gas,diesel
<b>2<sup>ND</sup></b>	1 <sup>ST</sup>	Properties of conventional fuels used in the energy conversion equipment used in thermal power plants:c) Nuclear fuels-fusion and fission action
	2 <sup>ND</sup>	Safe Practices and working of various thermal power plants: coal-based, gasbased, diesel-based, and nuclear-based
	3 <sup>RD</sup>	Functions of the following types of thermal power plants and their major auxiliaries
<b>3<sup>RD</sup></b>	1 <sup>ST</sup>	a) Coal fired boilers: fire tube and water tube
	2 <sup>ND</sup>	b) Gas/diesel based combustion engines
	3 <sup>RD</sup>	c) Types of nuclear reactors :Disposal of nuclear waste and nuclear shielding
<b>4<sup>TH</sup></b>	1 <sup>ST</sup>	Class test
		<b>2.Large and Micro-Hydropower Plants</b>
	2nd	Energy conversion process of hydro power plant
	3rd	Classification of hydro power plant: High ,mediumand low head
<b>5<sup>TH</sup></b>	1 <sup>ST</sup>	Construction and working of hydro turbines used in different types of hydro power plant
		a) High head-Pelton turbine
	2 <sup>ND</sup>	b) Mediumhead-Francis turbine,c) Low head-Kaplan turbine
	3 <sup>RD</sup>	Safe Practices for hydro power plants
<b>6<sup>TH</sup></b>	1 <sup>ST</sup>	Different types of micro-hydro turbinesfor different heads: Pelton, Francis and Kaplan turbines
	2 <sup>ND</sup>	Locations of these different types of large and micro-hydro power plants in Indi
	3 <sup>RD</sup>	Class test
<b>7<sup>TH</sup></b>		<b>3.Solar and Biomass based Power Plants</b>
	1st	Solar Map of India: Globalsolar power radiation

	2nd	Solar Power Technology: a) Concentrated Solar Power (CSP) plants, construction and working of: Power Tower, Parabolic Trough, Parabolic Dish, Fresnel Reflectors
	3rd	b) Solar Photovoltaic (PV) power plant: layout, construction, working
8 <sup>TH</sup>	1 <sup>ST</sup>	Biomass-based Power Plants a) Layout of a Bio-chemical based (e.g. biogas) power plant
	2 <sup>ND</sup>	b) Layout of a Thermo-chemical based (e.g. Municipal waste) power plant
	3 <sup>RD</sup>	c) Layout of an Agro-chemical based (e.g. bio-diesel) power plant
9 <sup>TH</sup>	1 <sup>ST</sup>	Class test
	2 <sup>ND</sup>	Features of the solid, liquid and gas biomasses as fuel for biomass power plant
	3 <sup>RD</sup>	Assignment
10 <sup>TH</sup>		<b>4. Wind Power Plants</b>
	1st	WindMap of India: Wind power density in watts per square meter, Layout of Horizontal axis large wind power plant
	2nd	Geared wind power plant
	3rd	Direct-drive wind power plant
11 <sup>TH</sup>	1 <sup>ST</sup>	Salient Features of electric generators used in large wind power plants a) Constant Speed Electric Generators)
	2 <sup>ND</sup>	b) Squirrel Cage Induction Generators (SCIG), c) Wound Rotor Induction Generator (WRIG)
	3 <sup>RD</sup>	Variable Speed Electric Generators a) Doubly-fed induction generator (DFIG)
12 <sup>TH</sup>	1 <sup>ST</sup>	b) Wound rotor synchronous generator (WRSG)
	2 <sup>ND</sup>	c) Permanent magnet synchronous generator (PMSG)
	3 <sup>RD</sup>	Assignment
13 <sup>TH</sup>		<b>5. Economics of Power Generation and Interconnected Power System</b>
	1st	Related terms: connected load, firm power, cold reserve, hot reserve, spinning reserve. Base load and peak load plants; Load curve, load duration curve, integrated duration curve
	2 <sup>ND</sup>	Cost of generation: Average demand, maximum demand, demand factor, plant capacity factor, plant use factor, diversity factor, load factor and plant load factor
	3 <sup>RD</sup>	Class test
14 <sup>TH</sup>	1 <sup>ST</sup>	Choice of size and number of generator units
	2 <sup>ND</sup>	Combined operation of power station
	3 <sup>RD</sup>	Causes, Impact and reasons of Grid system fault: a) State grid, national grid, brownout and blackout;
15 <sup>TH</sup>	1 <sup>ST</sup>	b) sample blackouts at national and international level.
	2 <sup>ND</sup>	Assignment
	3 <sup>RD</sup>	REVISION

Signature of faculty:-  
M. Lalitha  
 10/09/25

Dr. M. V.  
 10.09.25  
 HOD / EEE Dept

