NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE& affiliated to SCTE&VT, Odisha)

LESSON PLAN

TH:2- INTRODUCTION TO POWER GENERATION SYSTEMS

Name Of The Faculty :-Er. Prakash Kumar Mohanty
Branch :- Electrical & Electronic Engineering **Semester** :- 3RD
Session :-2025-26 **Examination** :-2025 (W)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
1	Thermal Power Plants: Coal, Gas/Diesel and Nuclear-based	10	12
2	Large and Micro-Hydropower Plants	9	13
3	Solar and Biomass based Power Plants	9	12
4	Wind Power Plants	9	13
5	Economics of Power Generation and Interconnected Power System	8	10
TOTAL		45	60

10.7.25
Sign of Faculty

10/07/25
Sign of H.O.D.

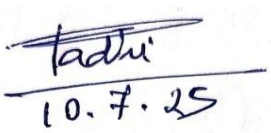
Name of the programme: Diploma in Electrical & Electronics Engineering	Semester: 3rd	**Name of the Teaching Faculty:** Er.Prakash Kumar Mohanty	
		Academic Year : 2025-26 **Examination :** 2025 (W)	
Course Code: EEEPC203/ TH:2	**Course Year:** 2ND Year	**No. of Classes Alloted Per Week :**	4
		Planned Classes Required to Complete the Course	60

Week	Class Day	Topics to be Covered
1st	1st	**Thermal Power Plants: Coal, Gas/Diesel and Nuclear-based** 1.1 Layout and working of a typical thermal power plant with steam turbines and electric generators
	2nd	1.1 Layout and working of a typical thermal power plant with steam turbines and electric generators
	3rd	1.2 Properties of conventional fuels used in the energy conversion equipment used in thermal power plants: Coal, Gas, Diesel, Nuclear fuels-fusion and fission action
	4th	1.2 Properties of conventional fuels used in the energy conversion equipment used in thermal power plants: Coal, Gas, Diesel, Nuclear fuels-fusion and fission action
2nd	1st	1.3 Safe Practices and working of various thermal power plants: coal-based, gas- based, diesel-based, and nuclear-based
	2nd	1.3 Safe Practices and working of various thermal power plants: coal-based, gas- based, diesel-based, and nuclear-based
	3rd	1.4 Functions of the following types of thermal power plants and their major auxiliaries
	4th	1.4 Functions of the following types of thermal power plants and their major auxiliaries
3rd	1st	1.4.1 Coal fired boilers: fire tube and water tube
	2nd	1.4.1 Coal fired boilers: fire tube and water tube
	3rd	1.4.2 Gas/diesel based combustion engines
	4th	1.4.3 Types of nuclear reactors :Disposal of nuclear waste and nuclear shielding
4th	1st	**Large and Micro-Hydropower Plants** 2.1 Energy conversion process of hydro power plant
	2nd	2.2 Classification of hydro power plant: High ,medium and low head
	3rd	2.3 Construction and working of hydro turbines used in different types of hydro power plant

week	Class Day	Topics to be Covered
4th	4th	2.3 Construction and working of hydro turbines used in different types of hydro power plant
5th	1st	2.3.1 High head-Pelton turbine
	2nd	2.3.2 Medium head-Francis turbine
	3rd	2.3.3 Low head-Kaplan turbine
	4th	2.4 Safe Practices for hydro power plants
6th	1st	2.5 Different types of micro-hydro turbines for different heads: Pelton, Francis and Kaplan turbines
	2nd	2.5 Different types of micro-hydro turbines for different heads: Pelton, Francis and Kaplan turbines
	3rd	2.5 Different types of micro-hydro turbines for different heads: Pelton, Francis and Kaplan turbines
	4th	2.6 Locations of these different types of large and micro-hydro power plants in India
7th	1st	2.6 Locations of these different types of large and micro-hydro power plants in India
	2nd	**Solar and Biomass based Power Plants** 3.1 Solar Map of India: Global solar power radiation
	3rd	3.1 Solar Map of India: Global solar power radiation
	4th	3.2 Solar Power Technology
8th	1st	3.2.1 Concentrated Solar Power (CSP) plants, construction and working of: Power Tower, Parabolic Trough, Parabolic Dish, Fresnel Reflectors
	2nd	3.2.1 Concentrated Solar Power (CSP) plants, construction and working of: Power Tower, Parabolic Trough, Parabolic Dish, Fresnel Reflectors
	3rd	3.2.2 Solar Photovoltaic (PV) power plant: layout, construction, working
	4th	3.3 Biomass-based Power Plants
9th	1st	3.3.1 Layout of a Bio-chemical based (e.g. biogas) power plant
	2nd	3.3.2 Layout of a Thermo-chemical based (e.g. Municipal waste) power plant
	3rd	3.3.3 Layout of an Agro-chemical based (e.g. bio-diesel) power plant
	4th	3.3.3 Layout of an Agro-chemical based (e.g. bio-diesel) power plant

Week	Class Day	Topics to be Covered
10th	1st	3.3.4 Features of the solid, liquid and gas biomasses as fuel for biomass power plant
	2nd	**Wind Power Plants** 4.1 Wind Map of India: Wind power density in watts per square meter
	3rd	4.2 Layout of Horizontal axis large wind power plant
	4th	4.3 Geared wind power plant
11th	1st	4.4 Direct-drive wind power plant
	2nd	4.5 Salient Features of electric generators used in large wind power plants
	3rd	4.5.1 Constant Speed Electric Generators)
	4th	4.5.2 Squirrel Cage Induction Generators (SCIG)
12th	1st	4.5.2 Squirrel Cage Induction Generators (SCIG)
	2nd	4.5.3 Wound Rotor Induction Generator (WRIG)
	3rd	4.6 Variable Speed Electric Generators
	4th	4.6.1 Doubly-fed induction generator (DFIG)
13th	1st	4.6.2 Wound rotor synchronous generator (WRSG)
	2nd	4.6.3 Permanent magnet synchronous generator (PMSG)
	3rd	**Economics of Power Generation and Interconnected Power System** 5.1 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
	4th	5.1 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
14th	1st	5.2 Cost of generation: Average demand, maximum demand, demand factor, plant capacity factor, plant use factor, diversity factor, load factor and plant load factor
	2nd	5.2 Cost of generation: Average demand, maximum demand, demand factor, plant capacity factor, plant use factor, diversity factor, load factor and plant load factor
	3rd	5.3 Choice of size and number of generator units

week	Class Day	Topics to be Covered
14th	4th	5.3 Choice of size and number of generator units
15th	1st	5.4 Combined operation of power station
	2nd	5.4 Combined operation of power station
	3rd	5.5 Causes, Impact and reasons of Grid system fault: State grid, national grid, brownout and blackout; sample blackouts at national and international level
	4th	5.5 Causes, Impact and reasons of Grid system fault: State grid, national grid, brownout and blackout; sample blackouts at national and international level



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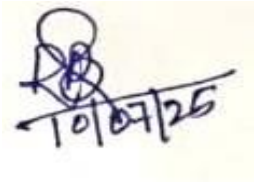

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