

GOVT. POLYTECHNIC KANDHAMAL, (PHULBANI)

LESSON PLAN: INTRODUCTION TO ELECTRIC GENERATION SYSTEMS

3RD – SEMESTER, 2026 (W)

Discipline: Electrical Engineering	Semester: Winter 2026	Name of the teaching faculty: PRASANTA KUMAR DAS
Subject: IEGS	No of days/per week class allotted: 03	Semester From Date: 01.07.2026 To Date: 05.11.2026 No of weeks: 15
Week:	Class day:	Theory/practical topics:
1ST	1ST	UNIT-I (Thermal Power Plants: Coal, Gas/Diesel and Nuclear-based) Layout and working of a typical thermal power plant with steam turbines and electric generators
	2ND	Layout and working of a typical thermal power plant with steam turbines and electric generators
	3RD	Properties of conventional fuels used in the energy conversion equipment used in thermal power plants: Coal
2ND	1ST	Properties of conventional fuels used in the energy conversion equipment used in thermal power plants: Gas
	2ND	Properties of conventional fuels used in the energy conversion equipment used in thermal power plants: Diesel
	3RD	Nuclear fuels-fusion
3RD	1ST	Nuclear fuels-fission action
	2ND	Safe Practices and working of various thermal power plants: coal based
	3RD	Safe Practices and working of various thermal power plants: gas- based
4TH	1ST	Safe Practices and working of various thermal power plants: diesel-based
	2ND	Safe Practices and working of various thermal power plants: Nuclear -based
	3RD	Functions of the following types of thermal power plants and their major auxiliaries :Coal fired boilers: fire tube
5TH	1ST	Functions of the following types of thermal power plants and their major auxiliaries :Coal fired boilers: water tube
	2ND	Gas/diesel based combustion engines
	3RD	Types of nuclear reactors :Disposal of nuclear waste and nuclear shielding
6TH	1ST	Doubt clearing classes

	2 ND	UNIT-II (Large Hydropower Plants) Energy conversion process of hydro power plant
	3 RD	Energy conversion process of hydro power plant
7 TH	1 ST	Classification of hydro power plant: High ,medium and low head
	2 ND	Classification of hydro power plant: High ,medium and low head
	3 RD	Construction and working of hydro turbines used in different types of hydro power plant: High head-Pelton turbine
8 TH	1 ST	Construction and working of hydro turbines used in different types of hydro power plant: Medium head-Francis turbine
	2 ND	Construction and working of hydro turbines used in different types of hydro power plant: Low head-Kaplan turbine
	3 RD	Safe Practices for hydro power plants , Locations of these different types of large hydro power plants in India
9 TH	1 ST	Doubt clearing classes & Previous semester question discussion
	2 ND	UNIT-III (Micro-Hydropower Plants) Lay out of micro hydro power plants
	3 RD	Lay out of micro hydro power plants
10 TH	1 ST	Different types of micro-hydro turbines for different heads: Pelton turbines
	2 ND	Francis turbines
	3 RD	Kaplan turbines
11 TH	1 ST	Locations of these different types of micro-hydro power plants in India
	2 ND	Doubt clearing classes
	3 RD	Previous semester question discussion
12 TH	1 ST	UNIT-IV(Economics of Power Generation and Interconnected Power System) Related terms: connected load, firm power
	2 ND	Cold reserve, hot reserve, spinning reserve
	3 RD	Base load and peak load plants; Load curve, load duration curve
13 TH	1 ST	Integrated duration curve
	2 ND	Cost of generation: Average demand, maximum demand,
	3 RD	Demand factor, plant capacity, factor, plant use factor
14 TH	1 ST	Diversity factor, load factor and plant load factor
	2 ND	Choice of size and number of generator units , Combined operation of power station

15 TH		Causes
	3 RD	Impact and reasons of Grid system State grid, national grid
	1 ST	Brownout and blackout
	2 ND	Sample blackouts at national and international level.
	3 RD	Doubt clearing classes, Previous semester question discussion

COURSE OUTCOMES

CO-1:

Identify, classify, and explain the components, working principles, and combined operation of various power plants.

CO-2:

Illustrate the performance, faults, operational terms, and economics of electrical power generation in different power plants.

CO-3:

Analyze the problems associated with electrical power generation and evaluate the operation and performance of power plants for efficient power production.



Sign. of Faculty Concerned



Sign. of HOD