SYNERGY SCHOOL OF ENGINEERING, DHENKANAL

LESSON PLAN

Session (2025-2026)

Discipline: Electrical Engg	**Semester:** 3rd, Summer/2025	**Name of the Teaching Faculty:** **Dr.ANANTA KUMAR SAHOO**
Subject: Renewabl Energy PowerPlant(EEPC209)	**No. of Days/Week:** 03	**Start Date:** 15/07/2025 **End Date:** 15/11/2025

Week	Class Day	Theory Topics	Date of Delivery
1st	1st	Introduction to Renewable energy: Environmental consequences of fossil fuel use	
	3rd	Importance of renewable sources of energy. Sustainable Design and development. Types of RE sources. Limitations of RE sources	
	6th	Present Indian and international energy scenario of conventional and RE sources, Introduction to solar Energy	
2nd	1st	Solar photovoltaic system-Operating principle Photovoltaic cell concepts Cell, module, array, Series and parallel connections. Maximum power point tracking (MPPT).	
	3rd	Classification of energy Sources. Extra-terrestrial and terrestrial Radiation	
	6th	Azimuth angle, Zenith angle, Hour angle, Irradiance, Solar constant. Solar collectors Types	
3rd	1st	Solar collectors Types	
	3rd	Solar collectors' performance characteristics	
	6th	Flat plate type solar collector Concentrating type solar collector	
4th	1st	Applications: Photovoltaic - battery charger, domestic lighting, street lighting, water pumping,	
	3rd	Working of solar cooker, Solar Pond ,Introduction to Wind energy. Wind energy conversion.	
	6th	Types of wind turbines, Aerodynamics of wind rotors	
5th	1st	Wind turbine control systems; conversion to electrical power	
	3rd	Wind turbine control systems; conversion to electrical power	
	6th	Main parts of wind turbines	
	1st	Vertical and horizontal type wind turbine.	

6th	3rd	Types of winds turbine rotors ,Grid connected and self-excited induction generator operation.	
	6th	Grid connected and self-excited induction generator operation.	
7th	1st	Single and double output systems.	
	3rd	Constant voltage and constant frequency generation with power electronic control., Single and double output systems.	
	6th	Characteristics of wind power plant.	
8th	1st	*Assignment Evaluation & Class Test*	
	3rd	Types of Biomass Fuels - Solid, Liquid and Gas	
	6th	Combustion and fermentation in biomass. Conversion of bio-gas	
9th	1st	Anaerobic digestion. Wood gassifier	
	3rd	Types of biogas digester,Explain Pyrolysis	
	6th	Applications: Bio gas, Bio diesel	
10th	1st	Working of Tidal power systems, Ocean Thermal Energy Conversion (OTEC).	
	3rd	Ocean Thermal Energy – Classification	
	6th	Geothermal Energy – Classification. Hybrid Energy Systems.	
11th	1st	*Doubt Clearing class*	
	3rd	Need for Hybrid Systems	
	6th	Explain Diesel-PV. Explain Wind-PV	
12th	1st	Explain Wind-PV	
	3rd	Case studies on wind energy	
	6th	Case studies on wind energy	
13th	1st	Explain Micro-hydel energy	
	3rd	Explain Micro-hydel-PV	
	6th	Electric vehicles. hybrid electric vehicles	
14th	1st	Electric and hybrid electric vehicles	
	3rd	*Doubt Clearing class*	
	6th	*Discussion of Previous year questions*	

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PREPARED BY

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