SYNERGY SCHOOL OF ENGINEERING, DHENKANAL
LESSON PLAN
Session (2023-2024)

Discipline: Electrical ENGG	**Semester:** 6th, Summer/2025	**Name of the Teaching Faculty:** SUNANDITA SAHOO
Subject: Renewable Energy System Theory-TH-4 (b)	**No. of Days/Week:** 05	**Start Date:** 16/01/2024 **End Date:** 27/04/2024

Week	Class Day	Theory Topics
1st	1st	Introduction to Renewable energy: Environmental consequences of fossil fuel use
	2nd	Importance of renewable sources of energy. Sustainable Design and development.
	3rd	Types of RE sources. Limitations of RE sources
	4th	Present Indian and international energy scenario of conventional and RE sources
	5th	Introduction to solar Energy
2nd	1st	Solar photovoltaic system-Operating principle
	2nd	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
	4th	Azimuth angle, Zenith angle, Hour angle, Irradiance, Solar constant.
	5th	Solar collectors Types
3rd	1st	Solar collectors Types
	2nd	Solar collectors' performance characteristics
	3rd	*Doubt Clearing class*
	4th	Flat plate type solar collector
	5th	Concentrating type solar collector
4th	1st	Applications: Photovoltaic - battery charger, domestic lighting, street lighting, water pumping,
	2nd	Working of solar cooker, Solar Pond
	3rd	Introduction to Wind energy. Wind energy conversion.
	4th	Types of wind turbines
	5th	Aerodynamics of wind rotors
5th	1st	*Doubt Clearing class*
	2nd	Wind turbine control systems; conversion to electrical power
	3rd	*Assignment Evaluation &Class Test*
	4th	*QUIZ Test-1*
	5th	Main parts of wind turbines

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6th	1st	Vertical and horizontal type wind turbine.
	2nd	Types of winds turbine rotors
	3rd	Grid connected and self-excited induction generator operation.
	4th	Grid connected and self-excited induction generator operation.
	5th	Constant voltage and constant frequency generation with power electronic control.
7th	1st	Single and double output systems.
	2nd	Constant voltage and constant frequency generation with power electronic control.
	3rd	Single and double output systems.
	4th	Characteristics of wind power plant.
	5th	*Doubt Clearing class*
8th	1st	*Assignment Evaluation &Class Test*
	2nd	Energy from Biomass. Biomass as Renewable Energy Source
	3rd	Types of Biomass Fuels - Solid, Liquid and Gas
	4th	Combustion and fermentation in biomass
	5th	Conversion of bio-gas
9th	1st	Anaerobic digestion.
	2nd	Types of biogas digester Wood gassifier
	3rd	Explain Pyrolysis
	4th	Applications: Bio gas, Bio diesel
	5th	Tidal Energy: Energy from the tides, Barrage and Non-Barrage
10th	1st	Working of Tidal power systems
	2nd	Ocean Thermal Energy Conversion (OTEC).
	3rd	Ocean Thermal Energy – Classification
	4th	Geothermal Energy – Classification.
	5th	Hybrid Energy Systems.
11th	1st	*Doubt Clearing class*
	2nd	*Assignment Evaluation & Class Test*
	3rd	Need for Hybrid Systems
	4th	Explain Diesel-PV.
	5th	Explain Wind-PV

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12th	1st	Explain Wind-PV
	2nd	Explain Micro-hydel-PV
	3rd	Case studies on wind energy
	4th	*Doubt Clearing class*
	5th	*Assignment Evaluation &Class Test*
13th	1st	*QUIZ Test-1*
	2nd	Explain Micro-hydel energy
	3rd	Explain Micro-hydel-PV
	4th	Electric vehicles
	5th	hybrid electric vehicles
14th	1st	Electric and hybrid electric vehicles
	2nd	Electric and hybrid electric vehicles
	3rd	*Doubt Clearing class*
	4th	*Doubt Clearing class*
	5th	*Assignment Evaluation & Class Test*
15th	1st	*Assignment Evaluation &Class Test*
	2nd	*Discussion of Previous year questions*
	3rd	*Discussion of Previous year questions*
	4th	*Discussion of Previous year questions*
	5th	*Discussion of Previous year question*

14.01.2024
Subject Expert
Synergy School of Engineering
Dhenkanal

14/01/24
HOD, Electrical
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14/1/24
Academic CO-Ordinator
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