

SYNERGY SCHOOL OF ENGINEERING, DHENKANAL



LESSON PLAN
Session-2025-2026(SUMMER)

Discipline: Mechanical Engineering	Semester: 4TH , SUMMER/2026	Name of the Faculty: Mr Mihir Kumar Swain Lecturer Email ID: rmihirswain13@gmail.com
Subject: Renewable Energy Technologies TH-04(b)	No. of Days/week: 03	Start Date: 22/12/2025 End Date: 18 / 04 / 26

Week	Class Day	Theory Topics
1st	1st	Scenario of Renewable Energy (RE) Sources: Needs of renewable energy, advantages and limitations of RE. present energy scenario of conventional and RE sources.
	2nd	Solar Energy: Energy available from the sun, spectral distribution, solar radiation outside the earth's atmosphere and at the earth's surface,
	3rd	solar radiation geometry, Instruments for solar radiation measurements, empirical equations for prediction of availability of solar radiation,
2nd	1st	radiation on tilted surface solar energy conversion into heat, types of solar collectors, evacuated and non-evacuated solar air heater,
	2nd	concentrated collectors, thermal analysis of liquid flat plate collector. air heater and cylindrical parabolic collector,
	3rd	solar energy thermal storage, heating and cooling of buildings, solar pumping, solar cooker,
3rd	1st	solar still, solar drier, solar refrigeration and air conditioning
	2nd	solar pond, heliostat, solar furnace photovoltaic system for power generation
	3rd	, solar cell modules and arrays, solar cell types,

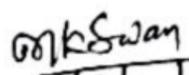


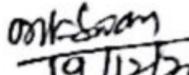
4th	1st	material, applications, advantages and disadvantages
	2nd	Wind Energy: Energy available from wind, basics of lift and drag,
	3rd	basics of wind energy conversion system,
5th	1st	effect of density, angle of attack and wind speed

	2nd	windmill rotors, horizontal and vertical axes rotors,
	3rd	drag, lift, torque and power coefficients
6th	1st	tip speed ratio, solidity of turbine
	2nd	wind turbine performance curves
	3rd	wind energy potential and site selection
7th	1st	basics of wind farm
	2nd	Important questions discussion in this chapter
	3rd	Bio Energy: Types of biogas plants
8th	1st	biogas generation
	2nd	factors affecting biogas generation,
	3rd	advantages and disadvantages
9th	1st	biomass energy, energy plantation
	2nd	energy gasification,
	3rd	types and applications of gasifiers
10th	1st	

		concept of green energy
	2nd	Ocean Energy: OTEC principle
	3rd	open, closed and hybrid cycle OTEC system
11th	1st	Energy from tides,
	2nd	estimation of tidal power
	3rd	tidal power plants, single and double basin plants,
12th	1st	site requirements, advantages and limitations
	2nd	wave energy, wave energy conversion devices
	3rd	advantages and disadvantages
13th	1st	ocean thermal energy

	2nd	Important questions discussion in this chapter
	3rd	Geothermal energy: Introduction, vapor and liquid dominated systems
14th	1st	binary cycle,
	2nd	hot dry rock resources
	3rd	magma resources
15th	1st	advantages and disadvantages
	2nd	applications
	3rd	Important questions discussion in this chapter


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