

ACADEMIC SESSION: 2023-24

Discipline: Electrical Engineering	Semester: 6th	Name of the Teaching Faculty: KIRAN KUMAR BHOI
Subject: Renewable Energy	No. of days / week class allotted	Semester From date: 16/01/2024 to 26/04/2024
Week	Class Day	Theory/ Practical Topics
1 ST	1 st	Environmental consequences of fossil fuel use.
	2 nd	Importance of renewable sources of energy.
	3 rd	Sustainable Design and development
	4 th	Types of RE sources.
2 ND	1 st	Limitations of RE sources, Present Indian and international energy scenario of conventional and RE sources
	2 nd	Question discussion
	3 rd	Solar photovoltaic system-Operating principle
	4 th	Photovoltaic cell concept Cell, module, array, Series and parallel connections
3 RD	1 st	Array, Series and parallel connections
	2 nd	Maximum power point tracking (MPPT).
	3 rd	Classification of energy Sources.
	4 th	Extra-terrestrial and terrestrial Radiation
4 TH	1 st	Azimuth angle, Zenith angle, Hour angle, Irradiance, Solar constant.
	2 nd	Solar collectors, Types
	3 rd	performance characteristics
	4 th	Applications: Photovoltaic - battery charger, domestic lighting
5 TH	1 st	street lighting, water pumping,
	2 nd	Solar cooker
	3 rd	Solar Pond.
	4 th	Question discussion
6 TH	1 st	Introduction to Wind energy
	2 nd	Wind energy conversion

	3 rd	Types of wind turbines
	4 th	Aerodynamics of wind rotors.
7 TH	1 st	Wind turbine control systems;
	2 nd	conversion to electrical power:
	3 rd	Induction and synchronous generators
	4 th	Grid connected and self excited induction generator operation.
8 TH	1 st	. Constant voltage and constant frequency
	2 nd	Generation with power electronic control.
	3 rd	Single and double output systems
	4 th	Characteristics of wind power plant.
9 TH	1 st	Question discussion
	2 nd	Energy from Biomass
	3 rd	Biomass as Renewable Energy Source
	4 th	Types of Biomass Fuels
10 TH	1 st	Solid, gas, liquid
	2 nd	Combustion and fermentation
	3 rd	Anaerobic digestion
	4 th	Types of biogas digester
11 TH	1 st	Wood gassifier.
	2 nd	Pyrolysis
	3 rd	Applications: Bio gas
	4 th	Bio diesel
12 th	1 st	Question discussion
	2 nd	Tidal Energy: Energy from the tides
	3 rd	Barrage and Non-Barrage Tidal power systems.
	4 th	Ocean Thermal Energy Conversion (OTEC)
13 th	1 st	Types of Ocean Thermal Energy Conversion (OTEC)
	2 nd	Geothermal Energy
	3 rd	Classification
	4 th	Question discussion

14 th	1 st	Hybrid Energy Systems.
	2 nd	Need for Hybrid Systems
	3 rd	Diesel-PV
	4 th	Wind-PV
15 th	1 st	Microhydel-PV
	2 nd	Electric vehicles.
	3 rd	Hybrid electric vehicles.
	4 th	Question discussion

KKB
12.01.24

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