ACADEMIC SESSION: 2025-26

Discipline: Electrical engineering	Semester: 6th	Name of the Teaching Faculty: Kiran Kumar Bhoi
Subject: Renewable Energy System	No. of days / week class allotted	Semester From date: 22/12/2025 to 18/04/2026 Nos. of Weeks per semester: 15
Week	**Class Day**	**Theory Topics**
1ST	1st	Environmental consequences of fossil fuel use
	2nd	Importance of renewable energy sources
	3rd	Sustainable design and development
	4th	Types of renewable energy sources
	5th	Limitations of renewable energy sources
2ND	1st	Indian energy scenario
	2nd	International energy scenario
	3rd	Conventional vs Renewable comparison
	4th	Numerical
	5th	Revision
3RD	1st	Solar PV system principle
	2nd	PV cell construction & working
	3rd	Cell, module, array concepts
	4th	Series & parallel connections
	5th	MPPT concept
4TH	1st	Extra-terrestrial radiation
	2nd	Terrestrial radiation
	3rd	Solar constant
	4th	Solar angles (Azimuth, Zenith)
	5th	Numerical
5TH	1st	Hour angle & irradiance
	2nd	Solar collectors – introduction
	3rd	Types of solar collectors
	4th	Performance characteristics
	5th	Revision/Discussion
6TH	1st	Solar collectors – principle
	2nd	Types of solar collectors
	3rd	Flat plate collector

	4th	Concentrating collector
	5th	Numerical problems
7TH	1st	Solar battery charger
	2nd	Solar domestic lighting
	3rd	Solar street lighting
	4th	Solar water pumping system
	5th	Solar cooker & solar pond
8TH	1st	Introduction to wind energy
	2nd	Wind energy conversion system
	3rd	Types of wind turbines
	4th	Horizontal vs vertical axis turbines
	5th	Tutorial / discussion
9TH	1st	Aerodynamics of wind rotors
	2nd	Power coefficient & Betz limit
	3rd	Wind turbine control systems
	4th	Pitch & stall control
	5th	Revision
10TH	1st	Induction generator for wind
	2nd	Synchronous generator
	3rd	Grid connected wind system
	4th	Self-excited induction generator
	5th	Tutorial
11TH	1st	Constant voltage generation
	2nd	Constant frequency generation
	3rd	Power electronic control
	4th	Single & double output systems
	5th	Characteristics of wind power plant
12th	1st	Introduction to biomass energy
	2nd	Biomass as renewable energy source
	3rd	Types of biomass fuels
	4th	Combustion process
	5th	Fermentation process
13th	1st	Anaerobic digestion
	2nd	Types of biogas digesters

	3rd	Wood gasifier
	4th	Pyrolysis
	5th	Applications of bio gas & bio diesel
14th	1st	Tidal energy
	2nd	Barrage & non-barrage tidal systems
	3rd	Ocean thermal energy conversion
	4th	Geothermal energy classification
	5th	Hybrid energy systems
15th	1st	Need for hybrid energy systems
	2nd	Diesel–PV hybrid system
	3rd	Wind–PV & Microhydel–PV systems
	4th	Electric & hybrid electric vehicles
	5th	Revision

20.12.2025

Prepared By
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20.12.25

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