

Discipline :ELECTRICAL ENGINEERING	Semester :6th	Name of the Teaching Faculty: - Er.D.Biswal
Subject: RENEWABLE ENERGY SYSTEMS	No. of days/per week class allotted: 05	Semester From date: 16/01/2024 To Date: 26/04/2024
Week	Class Day	Theory Topics
1ST	1ST	Introduction to Renewable energy and Environmental consequences of fossil fuel use.
	2ND	Importance of renewable sources of energy.
	3RD	Sustainable Design and development.
	4TH	Types of RE sources and Limitations of RE sources.
	5TH	Present Indian and international energy scenario of conventional and RE sources.
2ND	1ST	Introduction to Solar Energy
	2ND	Solar photovoltaic system- Operating principle.
	3RD	Photovoltaic cell concepts
	4TH	Cell, module, array
	5TH	Series and parallel connections
3RD	1ST	Maximum power point tracking (MPPT).
	2ND	Classification of energy Sources.
	3RD	Extra-terrestrial Radiation
	4TH	Terrestrial Radiation
	5TH	Azimuth angle, Zenith angle, Hour angle
4TH	1ST	Irradiance, Solar constant
	2ND	Solar collectors
	3RD	Types and performance characteristics
	4TH	Applications: Photovoltaic-battery charger, domestic lighting, street lighting
	5TH	Applications: water pumping, solar cooker, Solar Pond.
5TH	1ST	Introduction to Wind energy.
	2ND	Wind energy conversion
	3RD	Types of wind turbines
	4TH	Aerodynamics of wind rotors.
	5TH	Wind turbine control systems; conversion to electrical power:
6TH	1ST	Induction generators
	2ND	Synchronous generators
	3RD	Grid connected and self-excited induction generator operation
	4TH	Constant voltage and constant frequency generation with power electronic control.
	5TH	Single output systems
7TH	1ST	Double output systems
	2ND	Characteristics of wind power plant
	3RD	Introduction to Biomass Power
	4TH	Energy from Biomass

7 th	5 TH	Biomass as Renewable Energy Source
8 TH	1 ST	Types of Biomass Fuels - Solid, Liquid and Gas
	2 ND	Combustion
	3 RD	Fermentation
	4 TH	Anaerobic Digestion
	5 TH	Types of biogas digester
9 TH	1 ST	Wood gasifier
	2 ND	Pyrolysis
	3 RD	Applications: Biogas
	4 TH	Applications: Biodiesel
	5 TH	Other Energy Sources
10 TH	1 ST	Tidal Energy
	2 ND	Energy from the tides
	3 RD	Barrage Tidal power systems
	4 TH	Non Barrage Tidal power systems
	5 TH	Ocean Thermal Energy Conversion (OTEC).
11 TH	1 ST	Geothermal Energy
	2 ND	Classification
	3 RD	Hybrid Energy Systems
	4 TH	Need for Hybrid Systems
	5 TH	Diesel-PV
12 TH	1 ST	Wind-PV
	2 ND	Micro hydel-PV
	3 RD	Electric vehicles
	4 TH	Hybrid electric vehicles
	5 TH	Doubt clearing