UTKAL INSTITUTE OF ENGINEERING & TECHNOLOGY

DISCIPLINE: electrical engineering	SEMESTER: 6TH Sem	NAME OF THE TEACHING FACULTY Engg KALAKAR MOHANTY		
SUBJECT: Th4. RENEWABLE ENERGY SYSTEMS	No of Days/Per week class allotted: 5 Class P/W(60)	Semester From Date:16/01/2024 To Date: 26/04/ 2024 No. Of Weeks: 12		
WEEK	**CLASS DAY**	**THEORY TOPICS** PART-A Introduction to Renewable energy:	**REMARKS**	
1st	1st	Environmental consequences of fossil fuel use	Date	Dean/Principal
	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	PART B Solar Energy: Solar photovoltaic system-Operating principle.		
	2nd	Solar photovoltaic system-Operating principle.		
	3rd	Solar photovoltaic system-Operating principle.		
	4th	Photovoltaic cell concepts		
	5th	Photovoltaic cell concepts		
3rd	1st	Classification of energy Sources.		
	2nd	Classification of energy Sources.		
	3rd	Extra-terrestrial and terrestrial Radiation.		
	4th	Extra-terrestrial and terrestrial Radiation.		
	5th	Azimuth angle, Zenith angle, Hour angle, Irradiance, Solar constant		
4th	1st	Azimuth angle, Zenith angle, Hour angle, Irradiance, Solar constant		
	2nd	Solar collectors, Types and performance characteristics,		
	3rd	Solar collectors, Types and performance characteristics,		
	4th	Applications: Photovoltaic - battery charger, domestic lighting, street lighting, water pumping, solar cooker, Solar Pond.		
	5th	Applications: Photovoltaic - battery charger, domestic lighting, street lighting, water pumping, solar cooker, Solar Pond.		

5th	1st	**PART C Wind Energy:** Introduction to Wind energy.		
	2nd	Introduction to Wind energy.		
	3rd	Wind energy conversion.		
	4th	Wind energy conversion.		
	5th	Types of wind turbines		
6th	1st	Aerodynamics of wind rotors.		
	2nd	Wind turbine control systems; conversion to electrical power		
	3rd	Induction and synchronous generators		
	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	Characteristics of wind power plant.		
	3rd	**PART D Biomass Power:** Energy from Biomass.		
	4th	Biomass as Renewable Energy Source		
	5th	Types of Biomass Fuels - Solid, Liquid and Gas.		
8th	1st	Types of Biomass Fuels - Solid, Liquid and Gas.		
	2nd	Anaerobic digestion.		
	3rd	Types of biogas digester.		
	4th	Wood gassifier.		
	5th	Wood gassifier.		
9th	1st	Pyrolysis,.		
	2nd	Pyrolysis,.		
	3rd	Applications: Bio gas, Bio diesel		
	4th	Applications: Bio gas, Bio diesel		
	5th	**PART F Other Energy Sources:** Tidal Energy: Energy from the tides, Barrage and Non Barrage Tidal power systems		
10th	1st	Tidal Energy: Energy from the tides, Barrage and Non Barrage Tidal power systems		
	2nd	Tidal Energy: Energy from the tides, Barrage and Non Barrage Tidal power systems		
	3rd	Tidal Energy: Energy from the tides, Barrage and Non Barrage Tidal power systems		

	4th	Ocean Thermal Energy Conversion (OTEC)		
	5th	Ocean Thermal Energy Conversion (OTEC)		
11th	1st	Geothermal Energy – Classification.		
	2nd	Geothermal Energy – Classification.		
	3rd	Hybrid Energy Systems.		
	4th	Hybrid Energy Systems.		
	5th	Need for Hybrid Systems.		
12th	1st	Need for Hybrid Systems.		
	2nd	Diesel-PV, Wind-PV, Microhydel-PV.		
	3rd	Diesel-PV, Wind-PV, Microhydel-PV.		
	4th	. Electric and hybrid electric vehicles.		
	5th	. Electric and hybrid electric vehicles.		
HOD		**DEAN**	**PRINCIPAL**