

# GOVT. POLYTECHNIC MAYURBHANJ LESSON PLAN

## ACADEMIC YEAR-2022-23

Discipline : ELECTRICAL ENGG.		Semester: 5th Sem		Name of the Teaching Faculty : ISWAR KUMAR SAHU	
Subject :	RENEWABLE ENERGY SYSTEMS				
No. of Days / per week class allotted : 05				Semester From date : 14.02.2023 To Date : 23.05.2023	
MONTH	Week	Class Day	Unit	Topics	
FEBRUARY	3rd	3rd	UNIT-I	1. Introduction to Renewable energy:	
		4th		1.1. Environmental consequenof fossil fuel use.	
		5th		1.2 Importance of renewable sources of energy.	
	4th	1st		1.3. Sustainable Design and development.	
		3rd		1.4 Types of RE sources.	
		4th		1.5. Limitations of RE sources.	
		5th		1.6. Present Indian and international energy scenario conventional and RE sources	
		6th		REVISION	
5th	1st	UNIT-II	2. Solar Energy:		
MARCH	1st	3rd		2.1. Solar photovoltaic system- Operating principle.	
		4th		2.2. Photovoltaic cell concepts	
		5th		2.2.1. Cell, module, array, Seriesand parallel connections.	
		6th		Maximum power point tracking (MPPT).	
	2nd	1st		2.3. Classification of energy Sources.	
		4th		2.4. Extra-terrestrial and terre Radiation.	
		5th		2.5. Azimuth angle, Zenith angle, Hour angle, Irradiance, Solar constant.	
		6th		CLASS TEST-1	
	3rd	1st		2.6. Solar collectors, Types and performance characteristics,	
		3rd		2.7. Applications: Photovoltaic - battery charger, domestic lighting, street lighting,	
		4th		water pumping, solarcooker, Solar Pond.	
		5th		REVISION	
		6th	UNIT-III	3. Wind Energy: Introduction to Wind energy.	
	4th	1st		Wind energy conversion.	
		3rd		Types of wind turbines	
		4th		Aerodynamics of wind rotors.	
		5th		Wind turbine control systems; conversion to electrical power:	
	5th	1st		Induction and synchronous generators.	

		3rd		Grid connected and self excited induction generator operation.
		5th		Constant voltage generation with power electronic control.
APRIL	2nd	1st		Constant frequency generation with power electronic control.
		3rd		Single and double output systems.
		4th		Hybrid connection & Single and double output systems.
		6th		Characteristics of wind power plant.
	3rd	1st		REVISION
		3rd	UNIT-IV	Biomass Power: Energy from Biomass.
		4th		Biomass as Renewable Energy Source
		6th		Types of Biomass Fuels - Solid, Liquid and Gas.
	4th	1st		Combustion and fermentation.
		3rd		INTERNAL ASSESSMENT
		4th		Anaerobic digestion.
		5th		Types of biogas digester.
	5th	6th		Wood gassifier.
		1st		Pyrolysis,.
		3rd		Applications: Bio gas, Bio diesel
		4th	UNIT-V	REVISION
		5th		Other Energy Sources
		6th		Tidal Energy: Energy from the tides, Barrage and Non Barrage
MAY	1st	1st		Tidal power systems.
		3rd		Ocean Thermal Energy Conversion (OTEC).
		4th		Geothermal Energy - Classification.
		6th		Hybrid Energy Systems.
	2nd	1st		Need for Hybrid Systems.
		3rd		Electric and hybrid electric vehicles.
		4th		INTERNAL
		5th		Electric and hybrid electric vehicles.
		6th		Introduction to Hybrid Electric Vehicles
	3rd	1st		Dynamics of hybrid and Electric vehicles
		3rd		REVISION
		4th		CLASS TEST-2
		6th		REVISION
	4th	1st		REVISION