Discipline: Electrical Engg.	Semester: 3rd Sem	Name of the Teaching Faculty: Er. Archana parida & Krushna Prasad Samantara
Subject: Th4. RENEWABLE ENERGY SYSTEMS	No of Days / Per week class allotted: 5 Classess P/W - (75)	Semester From Date: 15/09/2022 To Date: 22/09/2022 No. Of Weeks: 14
WEEK	**CLASS DAY**	**THEORY/PRACTICAL TOPICS**
1st	1st	**1.Introduction to Renewable energy:** 1.1. Environmental consequences of fossil fuel use**.**
	2nd	1.2. Importance of renewable sources of energy.
	3rd	1.3. Sustainable Design and development.
	4th	Previous class continue
	5th	1.4 Types of RE sources
2nd	1st	1.5 Limitations of RE sources
	2nd	1.6. Present Indian and international energy scenario of conventional and RE sources
	3rd	**2.Solar Energy:** 2.1. Solar photovoltaic system-Operating principle.
	4th	Continue of Previous class
	5th	2.2. Photovoltaic cell concepts Cell, module, array, Series connections.
3rd	1st	Photovoltaic cell concepts Cell, module, array, parallel connections.
	2nd	Maximum power point tracking (MPPT).
	3rd	Continue of Previous class
	4th	2.3. Classification of energy Sources.
	5th	Continue of Previous class
4th	1st	2.4. Extra-terrestrial and terrestrial Radiation.
	2nd	2.5. Azimuth angle, Zenith angle, Hour angle, Irradiance, Solar constant.
	3rd	2.6. Solar collectors, Types
	4th	performance characteristics.
	5th	2.7. Applications: Photovoltaic - battery charger ,domestic lighting
5th	1st	Street lighting, water pumping,solar cooker,solar pond.
	2nd	Doubt clear class
	3rd	**3.Wind Energy:** 3.1. Introduction to Wind energy.

	4th	3.2. Wind energy conversion.
	5th	Previous class continue
6th	1st	3.3. Types of wind turbines
	2nd	3.4. Aerodynamics of wind rotors.
		Revision class
	3rd	3.5. Wind turbine control systems; conversion to electrical power:
	4th	Doubt clear class
	5th	3.6. Induction and synchronous generators.
7th	1st	3.7. Grid connected and self excited induction generator operation.
	2nd	Revision class
	3rd	3.8. Constant voltage and constant frequency generation with power electronic control.
	4th	Continue of Previous class
	5th	3.9. Single and double output systems.
8th	1st	3.10. Characteristics of wind power plant.
	2nd	Class Test
	3rd	Previous Year Question answer discussion.
	4th	**4.Biomass Power:** 4.1. Energy from Biomass.
	5th	Previous class continue
9th	1st	4.2. Biomass as Renewable Energy Source
	2nd	4.3. Types of Biomass Fuels - Solid, Liquid and Gas.
	3rd	Previous class continue
	4th	4.4. Combustion and fermentation.
	5th	Previous class continue
10th	1st	Doubt clear class
	2nd	4.5. Anaerobic digestion.
	3rd	4.6. Types of biogas digester.
	4th	4.7. Wood gassifier

	5th	Previous class continue
11th	1st	4.8 Pyrolysis
	2nd	4.9. Applications: Bio gas, Bio diesel
	3rd	Previous class continue
	4th	Class test
	5th	**5.Other Energy Sources** 5.1. Tidal Energy: Energy from the tides, Barrage and Non Barrage
12th	1st	Previous class continue
	2nd	Revision class
	3rd	5.2. Ocean Thermal Energy Conversion (OTEC).
	4th	Previous class continue
	5th	5.3. Geothermal Energy – Classification .
13th	1st	Previous class continue
	2nd	5.4. Hybrid Energy Systems.
	3rd	Previous class continue
	4th	5.5. Need for Hybrid Systems.
	5th	Previous class continue
14th	1st	5.6. Diesel-PV,
	2nd	Wind-PV,
	3rd	Microhydel-PV.
	4th	Previous Year Question answer discussion.
	5th	Previous Year Question answer discussion.