

SUNDARGARH ENGINEERING SCHOOL, KIREI
LESSON PLAN
(2021-22)

Subject : RENEWABLE ENERGY

Discipline : ELECTRICAL ENGINEERING

Faculty : DEEPTIMAYEE PAETL

Semester : 6TH

Week	Weekly classes	Theory Topics
1 st		1.1. Environmental consequences of fossil fuel use. 1.2. Importance of renewable sources of energy. 1.3. Sustainable Design and development. 1.4. Types of RE sources. 1.5. Limitations of RE sources. 1.6. Present Indian and international energy scenario of convent and RE sources
2 nd		2. Solar Energy: 2.1. Solar photovoltaic system-Operating principle. 2.2. Photovoltaic cell concepts 2.2.1. Cell, module, array, Series and parallel connections. Maximum power point tracking (MPPT). 2.3. Classification of energy Sources.
3 rd		2.4. Extra-terrestrial and terrestrial Radiation. 2.5. Azimuth angle, Zenith angle, Hour angle, Irradiance, Solar constant. 2.6. Solar collectors, Types and performance characteristics, 2.7. Applications: Photovoltaic - battery charger, domestic lighting, street lighting, water pumping, solar cooker, Solar Pond.
4 th		3. Wind Energy: 3.1. Introduction to Wind energy. 3.2. Wind energy conversion. 3.3. Types of wind turbines 3.4. Aerodynamics of wind rotors. 3.5. Wind turbine control systems; conversion to electrical power:
5 th		

		<p>3.6. Induction and synchronous generators.</p> <p>3.7. Grid connected and self excited induction generator operation.</p> <p>3.8. Constant voltage and constant frequency generation with power electronic control.</p>
6 th		
		<p>3.9. Single and double output systems.</p> <p>3.10. Characteristics of wind power plant.</p>
7 th		<p>4. Biomass Power:</p> <p>4.1. Energy from Biomass.</p> <p>4.2. Biomass as Renewable Energy Source</p>
8 th		4.6. Types of biogas digester.

		4.7. Wood gassifier.
		4.8. Pyrolysis,.
		4.9. Applications: Bio gas, Bio diesel
9 th		5. Other Energy Sources
		5.1. Tidal Energy: Energy from the tides, Barrage and Non Barrage Tidal power systems.
10 th		5.2. Ocean Thermal Energy Conversion (OTEC).
		5.3. Geothermal Energy – Classification.
11 th		5.4. Hybrid Energy Systems.
		5.5. Need for Hybrid Systems.
		5.6. Diesel-PV, Wind-PV, Microhydel-PV.
		5.7. Electric and hybrid electric vehicles.
12 th		Discussion
13 th		
14 th		Discussion

HOD, Electrical Department

Principal