LESSON PLAN

Name of the Institute:	C. V. RAMAN POLYTECHNIC
Department:	ELECTRICAL ENGINEERING
Semester/Division/Branch:	6th SEM/EE
Subject Name with code:	RENEWABLE ENERGY RESOURCES (TH-4)
Total No. of Class (Required):	60L +15P=75
Faculty Name:	SAUBHAGYA RANJAN BEHERA

Class No.	*Brief description of the Topic/Chapter to be taught*	Remarks
1	**CH-1-Introduction to Renewable energy:** 1.1. Environmental consequences of fossil fuel use.	
2	1.2. Importance of renewable sources of energy.	
3	1.3. Sustainable Design and development.	
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T1	TUTORIAL CLASS	
5	1.4. Types of RE sources.	
6	1.5. Limitations of RE sources. 1.6. Present Indian and international energy scenario of conventional and RE sources	
7	**CH-2: Solar Energy:** 2.1. Solar photovoltaic system-Operating principle.	
8	2.2. Photovoltaic cell concepts 2.2.1. Cell, module, array	
T2	TUTORIAL CLASS	
9	Series and parallel connections. Maximum power point tracking (MPPT).	
10	2.3. Classification of energy Sources.	

11	2.4. Extra-terrestrial and terrestrial Radiation.	
12	2.5. Azimuth angle, Zenith angle, Hour angle, Irradiance, Solar constant.	
T3	TUTORIAL CLASS	
13	2.6. Solar collectors, Types and performance characteristics,	
14	2.7. Applications: Photovoltaic - battery charger,.	
15	domestic lighting, street lighting	
16	water pumping, solar cooker, Solar Pond	
T4	TUTORIAL CLASS	
17	**CH-3-Wind Energy:** 3.1. Introduction to Wind energy. 3.2. Wind energy conversion.	
18	3.3. Types of wind turbines	
19	3.4. Aerodynamics of wind rotors.	
20	3.5. Wind turbine control systems; conversion to electrical power	
T5	TUTORIAL CLASS	
21	3.6. Induction and synchronous generators.	
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24	3.7. Grid connected and self excited induction generator operation.	
T6	TUTORIAL CLASS	
25	3.7. Grid connected and self excited induction generator operation	
26	3.8. Constant voltage and constant frequency generation with power electronic control.	
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T7	TUTORIAL CLASS	

29	3.9. Single and double output systems.	
30	3.10. Characteristics of wind power plant.	
31	REVISION CLASS	
32	REVISION CLASS	
T8	TUTORIAL CLASS	
33	**CH-4-Biomass Power:** 4.1. Energy from Biomass.	
34	4.2. Biomass as Renewable Energy Source	
35	4.3. Types of Biomass Fuels - Solid, Liquid and Gas.	
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T9	TUTORIAL CLASS	
37	4.4. Combustion and fermentation..	
38	4.5. Anaerobic digestion	
39	4.6. Types of biogas digester.	
40	4.7. Wood gassifier.	
T10	TUTORIAL CLASS	
41	4.8. Pyrolysis	
42	REVISION CLASS	
43	4.9. Applications: Bio gas	
44	4.9. Applications: Bio gas	
T11	TUTORIAL CLASS	
45	CH-5: Other Energy Sources 5.1. Tidal Energy: Energy from the tides	
46	Barrage and Non Barrage Tidal power systems.	
47	Barrage and Non Barrage Tidal power systems.	
48	5.2. Ocean Thermal Energy Conversion (OTEC)..	
T12	TUTORIAL CLASS	

49	5.2. Ocean Thermal Energy Conversion (OTEC).	
50	5.3. Geothermal Energy – Classification	
51	5.3. Geothermal Energy – Classification	
52	5.4. Hybrid Energy Systems.	
T13	TUTORIAL CLASS	
53	5.5. Need for Hybrid Systems	
54	5.5. Need for Hybrid Systems	
55	5.6. Diesel-PV,	
56	Wind-PV	
T14	TUTORIAL CLASS	
57	Microhydel-PV.	
58	5.7. Electric and hybrid electric vehicles	
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T15	TUTORIAL CLASS	

Saubhagya Ranjan Behra
Signature of the Faculty

Signature of the H.O.D