LESSON PLAN (SUMMER-2023)

Discipline: ETC	Semester:6th	Name of the Teaching Faculty: SABYASACHI PATTNAIK
Subject: Renewable Energy Sources	No of Days /per week class allotted:4	Semester From date: 13.02.2023 To date: 23.05.2023 No of Weeks:15
Week	**Class Day**	**Theory / Practical Topics**
1st	1st	**1. Energy Situation and Renewable Energy Sources (5)** 1.1 Renewable and Non-renewable Energy Sources
	2nd	1.2 Energy and Environment
	3rd	1.3 Origin of Renewable Energy Sources
	4th	1.4 Potential of Renewable Energy Sources
2nd	1st	1.5 Direct-use Technology
	2nd	**2. Solar Radiation & Collectors (6)** 2.1 Solar Radiation Through Atmosphere
	3rd	2.2 Terrestrial Solar Radiation
	4th	2.3 Measurement of Solar Radiation
3rd	1st	2.4 Classification of Solar Radiation Instruments
	2nd	2.5 Flat Plate Collectors
	3rd	2.6 Optical Characteristics
	4th	**3. Low-Temperature Applications of Solar Energy. (6)** 3.1 Swimming Pool Heating
4th	1st	3.2 Solar water Heating Systems
	2nd	3.3 Natural Convection water Heating Systems
	3rd	Continue
	4th	3.4 Solar Drying
5th	1st	3.5 Solar Pond
	2nd	**4. Passive Space Conditioning & Collectors (7)** 4.1 Principle Space conditioning
	3rd	Continue
	4th	4.2 Passive building concepts- Heating, Direct gain, Indirect G
6th	1st	Passive Cooling, Shading,Paints, Collings
	2nd	4.3 Construction of Concentrator
	3rd	Continue
	4th	4.4 Energy losses
7th	1st	**5. Solar Thermal Power Plants (8)** 5.1 Introduction
	2nd	5.2 Solar Collection System
	3rd	Continue
	4th	5.3 Thermal Storage for Solar Power Plants
8th	1st	Continue
	2nd	5.4 Capacity Factor and Solar Multiple
	3rd	Continue
	4th	5.5 Energy Conversion

9th	1st	**6. Solar Photovoltaics (8)** 6.1 Band Theory of Solids, Physical Processes in a Solar Cell ,
	2nd	6.2 Solar Cell Characteristics
	3rd	6.3 Equivalent Circuit Diagram of Solar Cells
	4th	6.4 Cell Types - Crystalline Silicon Solar Cell , Solar Cells for Concentrating Photovoltaic Systems , Dye –sensitized Solar
10th	1st	6.5 Solar Module
	2nd	6.6 Further System Components -Solar inverters ,MountingSystems,Storage Batteries ,Other System Components
	3rd	6.7 Grid-independent Systems -System Configuration
	4th	6.8 Grid-connected Systems -Small Roof Top Systems ,Medium-scale PV Generator ,Centralized System
11th	1st	**7. Wind Energy (5)** 7.1 Wind Flow and Wind Direction
	2nd	7.2 Wind Measurements
	3rd	7.3 Measurement of Pressure Head. 7.4 Hot wire Anemomete
	4th	7.5 Cup Anemometer (Robinson's Anemometer)
12th	1st	7.6 Wind Direction Indicators
	2nd	**8. Wind Energy Converters(8)** 8.1 Historical Development
	3rd	8.2 Aerodynamic of Rotor Blade -Wind Stream Profile
	4th	Buoyancy Coefficient and the Drag Coefficient
13th	1st	8.3 Components of a Wind Power Plant -Wind Turbine - Tower -Electric Generators –Foundation
	2nd	Continue
	3rd	8.4 Power Control -Slow Rotors;
	4th	Poor Control Mechanism -Control of Fast Rotors
14th	1st	**9. Energy economics (7)** 9.1 Present worth, Life cycle costing (LCC), Annual Life cyclecosting(ALCC),
	2nd	Annual savings. calculations for Solar thermal system
	3rd	9.2 Solar PV system,
	4th	Continue
15th	1st	9.3 Wind system,
	2nd	Continue
	3rd	9.4 Biomass system
	4th	Continue