

## RENEWABLE ENERGY SYSTEMS (Th 4)

Date of Commencement of classes: 14.02.2023

Date of Closing of classes: 25.05.2023

### LIST OF WEEK/ MONTH WISE AVAILABLE DAYS/ PERIODS

Sl. No.	Month	Week-wise no. of academic days available					Total no. of academic days
		Week- 1	Week- 2	Week- 3	Week- 4	Week- 5	
1	February	--	--	4	6	3	13
2	March	2	5	4	4	6	21
3	April	5	4	4	5	2	20
4	May	3	6	5	--	--	14
<b>Total</b>		<b>10</b>	<b>15</b>	<b>12</b>	<b>15</b>	<b>11</b>	<b>68</b>

### NO. OF AVAILABLE CLASSES PER WEEK/ MONTH

Sl. No.	Month	Week-wise no. of academic periods available					Total no. of academic periods
		Week- 1	Week- 2	Week- 3	Week- 4	Week- 5	
1	February	--	--	5	7	3	15
2	March	2	6	5	5	7	25
3	April	6	5	5	6	2	24
4	May	3	7	5	--	--	15
<b>Total</b>		<b>11</b>	<b>18</b>	<b>15</b>	<b>18</b>	<b>12</b>	<b>79</b>

### CHAPTER-WISE DISTRIBUTION OF PERIODS

Sl. No.	Name of the Chapter	Periods as per Syllabus	Required period	Expected Marks
01	INTRODUCTION TO RENEWABLE ENERGY	05	10	20
02	SOLAR ENERGY	15	15	20
03	WIND ENERGY	12	15	20
04	BIOMASS POWER	12	09	20
05	OTHER ENERGY SOURCES	16	11	20
	<b>TOTAL</b>	<b>60</b>	<b>60</b>	<b>100</b>

Sign of Lect.

Sign of HOD.

Sign of AIC

Sign of Principal

## LESSON PLAN

Name of the Month	Week No.	Class day	Art. No.	Name of the Faculty: APARNA PRUSTY
				Theory Topics
F E B R U A R Y	3 <sup>rd</sup>	1 <sup>st</sup>	1.1	<b>Chapter – 01(Introduction to Renewable energy)</b> Introduction
		2 <sup>nd</sup>		Environmental consequences of fossil fuel use
		3 <sup>rd</sup>	1.2	Importance of renewable sources of energy
		4 <sup>th</sup>	1.3	Sustainable Design
		5 <sup>th</sup>		Continue...
	4 <sup>th</sup>	1 <sup>st</sup>	1.6	& Sustainable Development
		2 <sup>nd</sup>		Types of RE sources
		3 <sup>rd</sup>		Limitation of RE sources
		4 <sup>th</sup>		Present Indian and international energy scenario of conventional and RE sources
		5 <sup>th</sup>		Continue...
		6 <sup>th</sup>		2.1
	7 <sup>th</sup>	Continue...		
	5 <sup>th</sup>	1 <sup>st</sup>	2.2	Photovoltaic cell concept
		2 <sup>nd</sup>	2.2.1	Cell, Module & Array
		3 <sup>rd</sup>		Series and parallel connections
	M A R C H	1 <sup>st</sup>	1 <sup>st</sup>	Maximum power point tracking (MPPT).
2 <sup>nd</sup>			2.3	Classification of energy Sources.
2 <sup>nd</sup>		1 <sup>st</sup>	2.4	Extra-terrestrial and terrestrial Radiation
		2 <sup>nd</sup>	2.5	Azimuth angle, Zenith angle, Hour angle,
		3 <sup>rd</sup>		Irradiance, Solar constant
		4 <sup>th</sup>	2.6	Solar collectors & its Type
		5 <sup>th</sup>		Solar Collectors performance Characteristic
6 <sup>th</sup>		2.7	Applications: Photovoltaic –i) battery charger, ii) domestic lighting,	
3 <sup>rd</sup>			1 <sup>st</sup>	iii) street lighting, iv) water pumping,
			2 <sup>nd</sup>	v)Solar cooker, vi) Solar Pond,
4 <sup>th</sup>		3 <sup>rd</sup>	3.1	<b>Chapter – 03(Wind energy)</b> Introduction to wind energy.
		4 <sup>th</sup>	3.2	Wind energy conversion
	5 <sup>th</sup>	3.3	Types of wind turbines	
	1 <sup>st</sup>		Continue	

		2 <sup>nd</sup>	3.4	Aerodynamics of wind rotors
		3 <sup>rd</sup>	3.5	Wind turbine control systems
		4 <sup>th</sup>		Wind energy to Electrical energy
		5 <sup>th</sup>	3.6	Induction and synchronous generators
	5 <sup>th</sup>	1 <sup>st</sup>		Continue
		2 <sup>nd</sup>	3.7	Grid connected and self-excited induction generator operation
		3 <sup>rd</sup>		Cont.
		4 <sup>th</sup>		Continue
		5 <sup>th</sup>	3.8	Constant voltage and constant frequency generation with power electronic control.
		6 <sup>th</sup>	3.9	Single and double output systems
7 <sup>th</sup>		3.10	Characteristics of wind power plant	
A P R I L	1 <sup>st</sup>	1 <sup>st</sup>	4.1	<b>Chapter – 04(Biomass Power)</b> Energy from Biomass
		2 <sup>nd</sup>	4.2	Biomass as Renewable Energy Source
		3 <sup>rd</sup>	4.3	Types of Biomass Fuels - Solid, Liquid and Gas
		4 <sup>th</sup>	4.4	Combustion and fermentation
		5 <sup>th</sup>	4.5	Anaerobic digestion
		6 <sup>th</sup>	4.6	Types of biogas digester
	2 <sup>nd</sup>	1 <sup>st</sup>	4.7	Wood gasifier
		2 <sup>nd</sup>	4.8	Pyrolysis
		3 <sup>rd</sup>	4.9	Applications: Bio gas, Bio diesel
		4 <sup>th</sup>	5.1	<b>Chapter- 05(Other Energy Sources)</b> Tidal Energy: Energy from the tides, Barrage and Non-Barrage Tidal power systems
		5 <sup>th</sup>		Continue .....
	3 <sup>rd</sup>	1 <sup>st</sup>	5.2	Ocean Thermal Energy Conversion (OTEC)
		2 <sup>nd</sup>	5.3	Geothermal Energy & its Classification
		3 <sup>rd</sup>	5.4	Hybrid Energy Systems
		4 <sup>th</sup>		Cont.
		5 <sup>th</sup>	5.5	Need for hybrid system
	4 <sup>th</sup>	1 <sup>st</sup>		Cont.
		2 <sup>nd</sup>	5.6	Diesel-PV, Wind-PV, Micro hydel-PV
		3 <sup>rd</sup>	5.7	Electric and hybrid electric vehicles
		4 <sup>th</sup>		Cont.
		5 <sup>th</sup>		Chapter 1 Revision
		6 <sup>th</sup>		Chapter 2 Revision
	5 <sup>th</sup>	1 <sup>st</sup>		Chapter 3 Revision
		2 <sup>nd</sup>		Chapter 4 Revision

M A Y	1 <sup>st</sup>	1 <sup>st</sup>	Chapter 4 Revision
		2 <sup>nd</sup>	Chapter 5 Revision
		3 <sup>rd</sup>	Chapter 5 Revision
	2 <sup>nd</sup>	1 <sup>st</sup>	Previous years question answer Discussion
		2 <sup>nd</sup>	Previous years question answer Discussion
		3 <sup>rd</sup>	Practice 1
		4 <sup>th</sup>	Practice 2
		5 <sup>th</sup>	Practice 3
		6 <sup>th</sup>	Practice 4
		7 <sup>th</sup>	Practice 5

Coverage of Chapters up to the internal assessment (Up to 2<sup>nd</sup> Week of May): **ALL**

***Learning Resources:***

Sl. No.	Name of the Book	Author Name	Publisher
01	Renewable Energy Sources & Emerging Technologies	D.P. Kothari, K.C. Signal, Rakesh Ranjan	PHI Learning Pvt. Ltd, New Delhi.
02	Non-Conventional Energy Resources	B.H.Khan	Tata Mc GrawHill
03	Non-Conventional Energy Resources	J.P.Navani & Sonal Sapra	S.Chand
04	Non-Conventional Energy Resources & Utilization	R.K. Rajput	S. Chand
05	Wind Electrical System	S.N. Bhadra, D. Kadstha, S. Banerjee	Ox ford Univ.Press, New Delhi.