Course Type	Course Code	Name of Course	L	T	P	Credits
DE	NMED514	Solar Energy	3	0	0	3

Course Objectives

Students can utilize the knowledge of this theoretical concept in solar based industries for manufacturing the collectors for capturing more and more energy from the Sun.

Learning Outcomes

Upon successful completion of this course, students will:

- be able to design the flat plate solar air / water heater.
- be able to design focusing type solar collector.
- 3. be able to use this solar energy concept for designing solar storage systems.

Unit No.	Topics to be Covered Lecture	Lecture Hours	Learning Outcomes
1	Need of sources of renewable energy, Introduction to different sources of renewable energy, Solar Energy and Applications	3L	Students will learn about renewable sources of energy
2	Basic concepts, Solar constant, Beam and diffused radiation	4L	For understanding further topics, knowledge of solar constant is very important for the students
3	Flat plate and concentrating collectors, Liquid Flat Plate Collector, Flat Plate Solar Air Heater, Concentrating Collectors	8L	Knowledge of different types of solar collectors are very important for capturing solar energy
4	Performance analysis of solar collector, Instantaneous collector efficiency	5L	Collector efficiency is one of the important performance parameters for the solar collectors. Students will learn this terminology
5	Overall loss coefficient, Collector efficiency factor, Collector heat removal factor	5L	Students will learn different losses during collection of energy through solar collectors
6	Concentration ratio, Tracking requirements, Thermal energy storages, Solar pond	10L	Students will learn about concentrating solar collector. Also, they will learn about the storage the solar energy
7	Economic Analysis	4L	Economics of solar energy utilization
8	Case studies: Performance test on CPC and Flat Plate collector	3L	Students will do some case studies by conducting the experiments on CPC and Flat plate collector
	Total	42 hrs	

Text books

1. S. P. Sukhatme, Solar Energy - Principles of Thermal Collection and Storage, TMH, 3rd Edition, 2008.

Reference books

1. John A. Duffie and William A. Beckman, Solar Engineering for Thermal Process, Wiley and Sons, 1st Edition, 2013.

2. H. P. Garg, Solar Energy, 1st Revised Edition, 2000.

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