

Photo Thermal Systems Assistant

Class: M.Sc II

Skill level: 10

Name of Co-ordinator: Mrs. Kolhe S. G

Department of Physics.

1. Title: Photo Thermal System Assistant
2. Year of implementation: 2020-21

Structure

Skill level	Theory Hours	Practical Hours	Total Hours	Credits	No. of students in batch
10	20	30	50	03	30

Syllabus

Learning Objectives: Students will understand

1. solar radiation spectra
2. to measure the Intensity of solar radiation
3. working principles of solar dryers

Theory Syllabus (20 Hrs)

Unit 1: Solar Radiation:

Nature of Solar Radiation, Global, Beam and Diffuse Radiation, Hourly, Daily and Seasonal variation of solar Radiation, Estimation of Solar Radiation, Measurement of Solar Radiation.

Unit II: Photo-Thermal Systems:

Hot Air Collector, Parabolic, Thermal Analysis of Solar Collectors, Performance of Solar Collectors, Solar Water Heating Systems (Active & Passive), Solar Dryers & Desalination Systems

Practical Syllabus (30 Hrs)

List of Experiments: (Any 08)

1. Measurement of Intensity of solar radiation.
2. Use of solar still as a water Purifier
3. Study of solar hot air collector/ solar dryer.
4. Solar Dryer.
5. Performance evaluation of box type and concentrating type solar cooker
6. Study of Performance of Solar Lamp
7. Study of solar hot water systems (FPC and ETC)
8. Determination of the open circuit voltage of the P-V panel.
9. Determination of the efficiency and fill factor of P-V Panel.
10. Determination of the Short circuit current of the P-V panel.

Learning Outcomes: After completion of the course, students are able to:

1. study the use of solar still as a water Purifier
2. determine open circuit voltage, short circuit current, efficiency and fill factor of P-V panel
3. Identify Performance evaluation of solar cooker.
4. study Thermal Analysis of Solar Collectors.

Recommended Books:

1. Solar Energy Conversion and Photo-energy Systems-R J Fuller, EOLSS Publications, 2010
2. Solar Engineering of Thermal Process - J.A.Duffie & W.A. Beckman, Wiley; 4th edition (15 April 2013)
3. Solar Energy Engineering - S.A.Kalogirou, Academic Press; 1st edition (July 7, 2009)

BOS Sub Committee:

- 1) Mrs Kolhe S.G.-Chairman
- 2) Dr. Kashid P.B

Expert Committee:

- 1) Dr. Adinath Funde
- 2) Mr. S. B. Yadav
(Solar industrialist)