

Solar Photovoltaic Assistant	
Class: M.Sc I	Skill level: 9
Name of Co-ordinator: Dr.P.B.Kashid	

Department of Physics

1. Title: Solar Photovoltaic Assistant

2. Year of implementation: 2020-21

Structure of Skill Development Course

Skill level	Theory Hours	Practical Hours	Total Hours	Credits	No. of students in batch
9	20	30	50	03	30

Syllabus

Learning Objectives: Students will understand

1. Importance of solar energy
2. Conventional and non-conventional energy source
3. Photovoltaic array
4. Solar Radiation spectrum

Theory (20 Hrs)

Unit 1: Photovoltaic System

Energy scenario, Importance of solar energy, solar power in India, Photovoltaic array, Concentration and storage of electrical energy, Photovoltaics modules, PV panels system and application

Unit II: Solar Cell

Solar Radiation, Solar Radiation spectrum, Air Mass Coefficient, Solar Radiation for different Air Mass Conditions, Principle of solar energy conversion, Photovoltaic Effect, Working Principle of Solar Cell, I – V Characteristics of Solar cell

Practical (30 Hrs)

List of Experiments:-----24 hr

1. Assessing the Effects of Light Intensity on the Efficiency of a Solar Cell
2. Assessing the Effects of Wavelength, Shading on the Efficiency of a Solar Cell
3. Assessing the Effects of Angle of Incidence on the Efficiency of a Solar Cell
4. Determination of I-V & P-V Characteristics of a Solar PV Panel
5. Effect of Load on Solar Panel Output
6. Determination of fill factor of P-V Panel.
7. Study of I-V Characteristic of a solar cell illuminated by an incandescent lamp, at different frequencies
8. Study of I-V Characteristic of a solar cell illuminated by sun
9. To Study the Characteristics of Solar Cell.

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

1. study Photovoltaic array.
2. determine Air Mass Coefficient.
3. determine I-V and P-V characteristics of PV Panel
4. study I-V Characteristics of Solar cell.

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)
4. Optoelectronics and Photonics by S.O. Kasap, TBS (January 1, 2001)
5. Solar Photovoltaics : Fundamentals , Technologies and Applications by Chetan Singh Solanki, PHI Learning; 3rd edition (9 May 2015)

BOS Sub Committee:

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

Expert Committee:

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