PARVATHANENI BRAHMAYYA
SIDDHARTHA COLLEGE OF ARTS & SCIENCE
Autonomous
Siddhartha Nagar, Vijayawada–520010
Re-accredited at 'A+' by the NAAC

23PHVAP101: SOLAR ENERGY

Offered to: ALL UG PROGRAMS

Year of Introduction: 2020-21 **Year of Revision: 2021-22** **Percentage of Revision: 100%**

Semester: II 30Hrs **Credits: 02**

Max.Time: 2 Hours

Course Description

This course gives you an introduction to the fundamentals of solar power as it applies to solar panel system installations. This course introduces the technology that converts solar energy to other energy resources such as electricity, heat and solar fuels with a main focus on electricity generation and explain how solar panels, or photovoltaic (PV). You will be able to identify the key components needed in a basic photovoltaic (solar panel) system, such as is found on a house or building, and explain the function of each component in the system. This course explores the advantages, limitations and challenges of different solar cell technologies, such as crystalline silicon solar cell technology, thin film solar cell technologies and the latest novel solar cell concepts as studied on lab-scale. We will discuss the specifications of solar modules and demonstrate how to design a complete solar system for any particular application

Course Objectives

1. Introduction to solar energy collectors
2. Introduction to various photovoltaics
3. Knowledge on Photovoltaics
4. Knowledge on conversion of different energies
5. Able to identify the key components needed in a basic photovoltaic (solar panel) system

Course Outcomes: After completion of this course, the students will know about

1. Energy Scenario, overview of solar energy conversion devices and applications, physics of propagation of solar radiation from the sun to earth
2. Sun-Earth Geometry, Extra-Terrestrial and Terrestrial Radiation, Solar energy measuring instruments
3. Fundamentals of solar PV cells
4. Solar thermal power generation (Solar concentrators).

List of experiments

1. Performance testing of solar cooker.
2. study of V-I characteristics of solar cell
3. Study the effect of input light intensity on the performance of solar cell.
4. Measurement of efficiency of solar flat plate collector
5. Study on solar photovoltaic panel in series and parallel combination.
6. Performance of solar module under various conditions (dusting)
7. Measurement of emissivity, reflectivity and transitivity
8. Effect of tilt angle on the efficiency of solar cell

Note :

1. 8 (Eight) experiments are to be done and recorded in the lab. These experiments will be evaluated in CIA.
2. For certification minimum of 7 (Seven) experiments must be done and recorded by student who had put in 90 % of attendance in the lab.
3. **Best 7 experiments are to be considered for CIA**.
4. 15 marks for CIA.
5. 35 marks for practical exam.

The marks distribution for the Semester End practical examination is as follows:

Formula/ Principle / Statement with explanation of symbols	05
Diagram/Circuit Diagram / Tabular Columns	05
Setting up of the experiment and taking readings/Observations	10
Calculations (explicitly shown) + Graph + Result with Units	05
Procedure and precautions	05
Viva-voce	05
Total Marks:	**35**

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22PHYT41: ELECTRICITY, MAGNETISM & ELECTRONICS **Offered to: B. Sc (MPC & MPCs)**
Semester: IV **60Hrs**
Course Type: Theory-Core **Credits: 4**
Year of Introduction: 2021-22

Course Objective:

1. Understand the magnetic effects of electric current.
2. Study the unification of electric and magnetic phenomena.
3. To gain knowledge about Maxwell's equations and EM waves
4. develop competence in using laboratory instruments to carry out experiments to study different electromagnetic phenomena, that will enhance student's classroom learning

Course outcomes:

On successful completion of this course, the students will be able to:

CO1 Remember and recollect basic electrodynamic definitions and apply them in daily life.
CO2 Ability to define and derive expressions for the energy both for the electrostatic and magnetostatic fields
CO3 Analyze Maxwell's equation in different forms (differential and integral) and derive Poynting's theorem from Maxwell's equations and physical interpretation.
CO4 Knowledge about semiconductors since it is a basic material used in many electronic components like diodes, transistors
CO5 An introduction to digital electronics which is useful in digital computers. Also logic gates and their applications.

CO-PO MATRIX								
	CO-PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**
22PHYT41	**CO1**							M
	CO2					H		
	CO3							H
	CO4						M	
	CO5						H	