



**VIKRAMA SIMHAPURI UNIVERSITY::NELLORE**

**Common Framework of CBCS for Colleges in Andhra Pradesh**

**(A.P. State of Council of Higher Education)**

**SYLLABUS OF**  
**SOLAR ENERGY**  
**SEMESTER-II**

**AS PART OF SKILL DEVELOPMENT COURSES**  
**UNDER CBCS FRAMEWORK WITH EFFECT FROM 2020-2021**

**PROGRAMME: FOUR-YEAR UG PROGRAMME**

B.A,B.Com,B.Sc, B.C.A and B.B.A Programmes

w.e.f 2020-21

**SEMESTER - II**  
**SKILL DEVELOPMENT COURSES**  
**SCIENCE STREAM**

Syllabus of  
**SOLAR ENERGY**

*Total 30 hrs (02h/wk),*

*02 Credits*

*Max Marks: 50*

**Learning Outcomes:**

*After successful completion of the course, students will be able to:*

- 1. Acquire knowledge on solar radiation principles with respect to solar energy estimation.*
- 2. Get familiarized with various collecting techniques of solar energy and its storage*
- 3. Learn the solar photovoltaic technology principles and different types of solar cells for energy conversion and different photovoltaic applications.*
- 4. Understand the working principles of several solar appliances like Solar cookers, Solar hot water systems, Solar dryers, Solar Distillation, Solar greenhouses*

**SYLLABUS:**

**UNIT-I – Solar Radiation:**

**(6 hrs)**

Sun as a source of energy, Solar radiation, Solar radiation at the Earth's surface, Measurement of Solar radiation-Pyroheliometer, Pyranometer, Prediction of available solar radiation, Solar energy-Importance.

**UNIT-II – Solar Thermal Systems:**

**(10 hrs)**

Principle of conversion of solar radiation into heat, Collectors used for solar thermal conversion: Flat plate collectors and Concentrating collectors.

**UNIT-III – Solar Photovoltaic Systems:**

**(10 hrs)**

Conversion of Solar energy into Electricity - Photovoltaic Effect, Solar photovoltaic cell and its working principle, Different types of Solar cells, Photovoltaic applications: Battery chargers, domestic lighting, street lighting and water pumping

**Co-curricular Activities (Hands on Exercises): (04 hrs)**

*[Any four of the following may be taken up]*

- 1. Plot sun chart and locate the sun at your location for a given time of the day.*
- 2. Analyse shadow effect on incident solar radiation and find out contributors.*
- 3. Connect solar panels in series & parallel and measure voltage and current.*
- 4. Measure intensity of solar radiation using Pyranometer and radiometers.*
- 5. Construct a solar lantern using Solar PV panel (15W)*
- 6. Assemble solar cooker*
- 7. Designing and constructing photovoltaic system for a domestic house requiring 5kVA power*
- 8. Assignments/Model Exam.*

**Reference Books:**

1. Solar Energy Utilization, G. D. Rai, Khanna Publishers
1. Solar Energy- Fundamentals, design, modeling & applications, G.N. Tiwari, Narosa Pub., 2005.
2. Solar Energy-Principles of thermal energy collection & storage, S.P. Sukhatme, Tata Mc-Graw Hill Publishers, 1999.
3. Solar Photovoltaics- Fundamentals, technologies and applications, Chetan Singh Solanki, PHI Learning Pvt. Ltd.,
4. Science and Technology of Photovoltaics, P. Jayarama Reddy, BS Publications, 2004.

**\* NOTE : Preferred teaching Department is Physics**

## MODEL QUESTION PAPER FORMAT

Max. Marks: 50

Time: 2 hrs (120 Minutes)

### SECTION- A

(4x5M=20 Marks)

*Answer any four questions. Each answer carries 5 marks  
(At least 1 question should be given from each Unit)*

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

### SECTION B

(3x10M = 30 Marks)

*Answer any three questions. Each answer carries 10 marks  
(At least 1 question should be given from each Unit)*

1.	
2.	
3.	
4.	
5.	

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