GUJARAT TECHNOLOGICAL UNIVERSITY
Syllabus for Bachelor of Vocation (B.Voc.), 3rd Semester
Branch: Solar & Renewable Energy
Subject Name: Design and Installation of Solar PV System
Subject Code: 1130702

Type of course: Under Graduate

Prerequisite: Solar PV System Design

Rationale: In the field of Solar & Renewable Energy, Solar energy is leading renewable source. It is essential to know the basic of solar system, construction, type of system. Enhance the knowledge of different system configuration. Construction of Solar PV system. Design of solar PV system. Solar PV system Performance analysis. Estimation and costing.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE(E)	PA(M)	ESE(V)	PA(I)	
3	0	0	3	50	0	0	0	50

Content:

Sr. No.	Topic	No. of Hours	Module Weightage
01	**Introduction to Solar PV system:** Block diagram to Solar PV system, PV module & array, Types of solar PV system, Solar Plant Components. Design Methodology of PV system. Grid-Connected System and Standalone system.	6	20%
02	**Design of Solar PV System:** Basics of Solar PV system components, Charge controller, Battery, Types of batteries use in PV system, MCB, MCCB, Fuse, Wire sizing, Power electronic Converter(Charge Controller, DC to DC Converter, DC to AC Converter), Maximum Power Point Tracking (MPPT). Detail Design of solar PV system, panel angle, Series parallel of panel & String design, ACDB & DCDB design. Components rating. Single line diagram for Solar PV system.	12	35%
03	**Performance analysis Solar PV System:** Power output of solar PV system. Monitoring of operating data and presentation, Power control and management systems for grid Synchronizing, Issues in integration of Synchronizing, Bidirectional metering concept. Unit cost of generated electricity. Simple Payback Period.	9	30%
04	**Solar PV Application:** Solar Water Pumps, Solar street lights, Solar kit design for remote location, (Battery sizing & Design) Solar thermal power generation.	3	15%

Distribution of marks weightage for cognitive level:

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	20	20	-	-	-

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze, E: Evaluate C: Create above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

1. Solar Photovoltaic: Fundamentals, Technologies and Application, Chetan Singh Solanki, PHI Learning Pvt., Ltd., 2009.
2. Renewable Energy Source & Emerging Technologies, D P Kothari, K C Singal. PHI Learning Pvt. Ltd.
3. Renewable Energy Technologies; A Practical Guide for Beginners, Chetan Singh Solanki, PHI School Books (2008)

Course Outcome:

Sr.No.	CO statement	Marks% weightage
CO1	Ability to understand basic of solar PV systems.	20
CO2	Detail knowledge of Solar PV system Design.	35
CO3	Do the performance analysis of Solar PV system.	30
CO4	Understand the different Solar PV application.	15