GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Bachelor of Vocation (B.Voc), 6th Semester
Branch: Solar and Renewable Energy
Subject Name: Solar PV Maintenance Technician
Subject Code: 1160708

Type of course: Elective

Prerequisite: None

Rationale: Carry out electrical maintenance of the ground mount solar PV power plant, Maintain personal health & safety at solar PV power plant

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE (E)	PA (M)	ESE (V)	PA (I)	
0	0	30	15	0	0	100	100	200

Content:

Sr. No.	Topic	No. of hours	% Weightage
1.	**Introduction to Solar PV Sector in India** Overview of solar PV technology and ground mount solar sector in India, understand the various market research reports and industrial magazines present in the market Type of ground mount PV Power Plants and working principles. overview of Rooftop Solar Sector in India	20	10%
2.	**Basic of Solar Rooftop System** Type of Rooftop Solar PV Power Plants and working principles. Overview of off grid Solar Sector in India. Type of off grid Solar PV Power devices and their working principles. System components and operating principles Basics of electrical concepts like voltage, current, power, energy, etc. Solar energy and power sector landscape in the country. Benefits of solar energy over conventional sources of energy	40	20%
3.	**Components & Specification.** Typical specifications, functioning, operating principle, maintenance requirements, handling procedures and warranties of different types of solar PV plant components like PV modules, inverters, cables, junction boxes, monitoring system and other components.	30	15%
4.	**Carry out electrical maintenance of the ground mount solar PV power plant** Verify the connections, cables and junction boxes as per the design/ working drawings. Measure the string current and verify the connections between modules in each string	30	15%

	periodically. If no monitoring of the strings at junction box/combiner box level has been designed Check the integrity and working condition of all connections, fuses and circuit breakers within junction boxes/combiner Boxes		
5.	**Inverter Maintenance & Earthing:** Check the continuity of cables and wires to ensure proper electrical connections throughout the solar PV power plant up to the inverter input. Troubleshoot the identified faults and escalate the issue to superiors if faults cannot be identified or rectified. Verify the earthing and lightening protection systems as per the as-built drawings and report in case of any discrepancies. Measure the resistance of earthing systems and identify the earth pits where the resistance exceeds design norms.	40	20%
6.	**Maintain personal health & safety at solar PV power plant** Identify corporate policies required for workplace safety. Identify contact person when workplace safety policies are violated. Provide information about incident/violation. Identify the location of first aid materials and administer first aid. Identify the personal protection equipment required for specific locations on-site. Safety helmet, Safety souse, Safety belt, , Ear plug, PVC hand glove, Cotton hand glove, Reflective jacket, Safety Gloves	30	15%
7.	**Work effectively with others.** Accurately pass on information to the authorized persons who require it and within agreed timescale and confirm its receipt. Demonstrate responsible and disciplined behaviours at the workplace.	10	5%

Suggested Specification table with Marks (Practical):

Distribution of Practical Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	20	30	10	10	20

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and 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.

Course Outcomes:

Sr No.	CO statement	Marks % weightage
CO1	Basic concept of Solar Rooftop System	10
CO2	Erection and maintenance of Solar Rooftop System	40
CO3	Inverter maintenance and Earthing in Solar Rooftop System	30
CO4	Understand health and safety practices on work place	20

Reference:

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)
4. https://nsdcindia.org/nos-listing/30