



GUJARAT TECHNOLOGICAL UNIVERSITY
Syllabus for Bachelor of Vocation (B.Voc.), 3rd Semester
Branch: Solar & Renewable Energy
Subject Name: Solar PV Module Manufacturing Technician
OJT Elective Subject
Subject Code: 1130708

Type of course: Elective

Teaching and Examination Scheme:

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

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment

Sr. No.	Module	Total Hrs.	Module % Weightage
1.	<p>Module 1: Introduction to Solar PV Technology</p> <p>Theory - Key Learning Outcomes: Discuss the role and responsibilities of a Manufacturing Technician and the importance of the course. Provide an overview of Solar PV Technology, including basic aspects, solar energy, power generation, and solar cell technology. Discuss different configurations of Solar PV Power plants.</p> <p>Practical - Key Learning Outcomes: Demonstrate the influence of irradiation on solar module performance. Use handheld irradiation meter. Interpret signs, notices, and cautions at project sites. Show Solar Module Construction & Manufacturing Process flow Chart.</p>	25	15
2.	<p>Module 2: Prepare and identify the BOM and its Specification for Solar Module</p> <p>Theory - Key Learning Outcomes: Discuss various materials used in solar module manufacturing and their specifications. Explain the Bill of Material (BOM) of a Solar Module.</p> <p>Practical - Key Learning Outcomes: Demonstrate and explain the application of each component in a Solar module. Prepare the BOM of a Solar Module.</p>	25	15
3.	<p>Module 3: Use of Soldering technology In Module Manufacturing</p> <p>Theory - Key Learning Outcomes: Explain the soldering process requirements and types used in solar module manufacturing.</p>	30	15



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	Discuss soldering of Solar Cell (String by String) and Junction Box Soldering techniques. Practical - Key Learning Outcomes: Demonstrate various soldering techniques. Perform soldering of solar cell strings and junction boxes.		
4.	Module 4: Solar Module Manufacturing process (Solar Cell Tabbing/Ribbon cutting) Duration: 40 hours Theory - Key Learning Outcomes: Discuss the flow chart of Solar module manufacturing processes. Explain the functions of various machines used for cell sorting, trimming, ribbon cutting, etc. Understand the processes of tabbing, layup of EVA and back sheet, and lamination. Practical - Key Learning Outcomes: Demonstrate solar cell tabbing and ribbon cutting techniques. Monitor and perform processes like cell sorting, EVA layup, and lamination.	20	13
5.	Module 5: Visual inspection and Electroluminescence (EL) Test Theory - Key Learning Outcomes: Explain visual inspection and its importance in identifying defects. Discuss the use of Sun Simulator and perform the EL test. Practical - Key Learning Outcomes: Demonstrate visual inspection techniques. Operate Sun Simulator and perform tests.	24	12
6.	Module 6: Packing of Solar PV Modules Theory - Key Learning Outcomes: Explain the solar module packing process and its importance. Discuss proper packaging materials and techniques. Practical - Key Learning Outcomes: Demonstrate the packing process of solar modules.	22	10
7.	Module 7: Maintain Personal Health & Safety in manufacturing facility Theory - Key Learning Outcomes: Identify safety requirements and hazards in a manufacturing facility. Explain the importance of personal protective equipment. Practical - Key Learning Outcomes: Demonstrate safe work practices and the use of personal protective equipment.	28	10
8.	Module 8: Employability Skills	26	10



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Theory - Key Learning Outcomes: Discuss key employability skills and their importance. Develop skills related to communication, career development, financial literacy, digital literacy, entrepreneurship, customer service, etc. Practical - Key Learning Outcomes: Create a professional CV. Conduct mock interviews and job searches.		
Total	200	100

Course Outcomes:

Sr. No.	CO Statement	Marks % Weightage
CO-1	Understand solar PV principles, including Manufacturing Technician's role.	30
CO-2	Master solar module manufacturing techniques with quality assurance.	30
CO-3	Apply safety measures in manufacturing for a secure environment.	25
CO-4	Develop employability skills for entry into solar PV industry.	15

Reference Books:

1. "Solar Photovoltaic Technology and Systems: A Manual for Technicians, Engineers, and Engineers" by Chetan Singh Solanki, Publisher: McGraw Hill Education India, Publication Year: 2015
2. "Solar Power Generation: Technology, New Concepts & Policy" by G.N. Tiwari and M.K. Ghosh, Publisher: CRC Press, Publication Year: 2016
3. "Photovoltaic Solar Energy Conversion" by S. Sumathi, L. Ashok Kumar, and P. Surekha, Publisher: Springer, Publication Year: 2015
4. "Solar Energy: Principles of Thermal Collection and Storage" by Sukhatme and Sukhatme, Publisher: Tata McGraw-Hill Education, Publication Year: 2008
5. "Solar Photovoltaic Technology and Systems: A Manual for Technicians, Engineers, and Engineers" by S. A. Khaparde and S. M. Khaparde, Publisher: Prentice-Hall of India Pvt.Ltd, Publication Year: 2011