



GOVERNMENT OF TAMILNADU

DIRECTORATE OF TECHNICAL EDUCATION, CHENNAI-25

**STATE PROJECT COORDINATION UNIT**

*(Established under Canada India Institutional Cooperation Project)*

**CURRICULUM**

Course Name	<b>SOLAR POWERED GADGETS TECHNICIAN</b>
Course Code	<b>EE/2020/019</b>
Course Duration	40 Hours
Minimum Eligibility Criteria	10 <sup>th</sup> /+2 /ITI/Diploma/Graduates
Pre-requisites (if any)	-
Course Objectives	<p>Training module has been designed for the participants to</p> <ul style="list-style-type: none"> <li>• Learn the principle of solar technology.</li> <li>• Learn the Installation and Maintenance of Solar Powered Gadgets.</li> <li>• Learn the troubleshooting of faults in solar powered gadgets.</li> </ul>
Course Outcomes	<p>At the end of training, the trainees will be able to</p> <ul style="list-style-type: none"> <li>• Explain the Principle of Solar Technology</li> <li>• Complete Installation and Maintenance of Solar Powered Gadgets.</li> <li>• Troubleshoot the faults in Solar Powered Gadgets.</li> </ul>
Expected Job Roles	Solar Portables Technician

**TEACHING AND SCHEME OF EXAMINATION**

Course Code	Course Name	Hours		Assessment Marks		Duration of Examination
				Min	Max	
EE/2020/019	SOLAR POWERED GADGETS TECHNICIAN	Theory	16	10	20	3 Hours
		Practical	24	40	80	
		Total	40	50	100	

**DETAILED SYLLABUS**

Unit No	Modules	No.of.Hours	
		Theory	Practical
<b>I</b>	<b>Basic Principles in Solar Technology</b>	<b>15 Hours</b>	
1.1	Solar Thermal Conversion Technology	10	05
1.2	Principles of Solar Radiation		
1.3	Solar Collector		
1.4	Absorption of radiation and Conversion to Thermal Energy		
1.5	Collection & Storage of Thermal Energy		
1.6	Solar Photovoltaic Cells.		
1.7	Solar PV Technology		
1.8	Stand Alone Solar PV System : Parts and Functions		
1.9	Storage Battery : Maintenance of Battery		
<b>II</b>	<b>Practical :Solar Gadgets</b>	<b>25 Hours</b>	
2.1	Solar Cookers: Repair and Maintenance	06	19
2.2	Domestic & Industrial Water Heaters: Installation and Testing		
2.3	Solar Dryer: Types, Installation and Testing		
2.4	Solar Lantern: Repair and Maintenance		
2.5	Solar Water Pumping: Solar photovoltaic pumping system, SPV modules, Drive and Water pump – Installation and Testing		
2.6	Solar Street Light : Installation and Testing		
<b>Total Theory and Practical Hours</b>		<b>16</b>	<b>24</b>
<b>Total hours</b>		<b>40</b>	

**HARDWARE REQUIREMENT**

S.NO	LIST OF TOOLS /EQUIPMENTS
1	Solar PV Module, Battery, Charge Controller
2	Inverter, Multimeter, Electrical Tools Set
3	Solar Cooker, Lantern, Street Light
4	Solar Water Pump & Solar Dryer (Field Visit)

**REFERENCE BOOKS**

S.NO	NAME OF THE BOOK	AUTHOR	PUBLISHER
1	Solar Electricity Basics: A Green Energy Guide	Dan Chira	New Society Publishers
2	Designing Indoor Solar Products	Julian Randall	Wiley

## ASSESSMENT AND CERTIFICATION

S.No	Criteria for assessment
1.	A trainee will be assessed based on the performance in End Examination for Theory and Practical conducted internally in the CIICP Project Polytechnic College for a duration of 3 hours
2.	A trainee must have 75% of attendance to appear for End examination in Theory and Practical.
3.	The assessment for theory part will be based on the marks scored in the end examination on the knowledge bank of questions (1 word/objective type questions)
4.	The assessment for practical part will be based on the marks scored in the end examination conducted by the CIICP Project Polytechnic and assessed by the Examiners approved by Strategic Plan Implementation Committee (SPIC) of the project polytechnic.
5.	The passing criteria for successful completion of training is every trainee should score 50% of marks in theory and practical examination.
6.	On successful completion of training, Certificate will be issued to the participants by the Directorate of Technical Education through the Project Polytechnics.

### END EXAMINATION

#### ALLOCATION OF MARKS

S.NO	Description	Max. Marks
1.	Theory Examination	20
2.	Practical Examination	
	a)Objective and Circuit Diagram	20
	b)Procedure and Connections / Execution	20
	c)Result and Viva	20
	d) Record	20
<b>Total Marks</b>		<b>100</b>

**THEORY MODEL QUESTION PAPER**  
**EE/2020/019 SOLAR POWERED GADGETS TECHNICIAN**  
**(Maximum Marks: 20)**

**(N.B: Answer any Twenty questions)**

**20x1= 20 Marks**

1. Define solar energy.
2. What is flat plate collector?
3. Explain the principle of solar radiation.
4. What is solar collector?
5. What are the types of solar collector?
6. What is meant by photoelectric effect?
7. Define a solar cell.
8. Define a solar photovoltaic system.
9. What are the types of solar panel?
10. Define the term PV Module.
11. Define the term PV array.
12. What are the different types of solar PV system?
13. What is meant by Stand-alone / Off-Grid solar PV system?
14. What is the role of charge controllers in a PV system?
15. What is meant by off-grid inverter?
16. What is the need for batteries in a stand –alone PV systems?
17. What is solar cooker?
18. What are the types of solar cookers?
19. What is solar water heater?
20. What are the types of solar dryer?
21. What is solar lantern?
22. What is solar water pump?
23. What are the components of solar water pumping system?
24. What is solar street light?
25. What are the components of solar street lighting system?