



राष्ट्रीय सौर ऊर्जा संस्थान  
**National Institute of Solar Energy**  
(An Autonomous Institution of Ministry of New and Renewable Energy)  
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**Sub: Expression of Interest (EOI) of Varunmitra Skill Development Programme for FY 2023-24.**

Expression of Interest is hereby invited to empanel Training Centres (TCs) to impart training under Solar Water Pumping Training Programme (Varunmitra). The empanelment of TCs may be considered for one year or beyond, subject to the continuity of the programme.

**Last date to submit the online application is 30/04/2024 up to 5:30PM**

The link for online submission of application is  
<https://varunmitra.nise.res.in/Enrollment/Login>.

This bears approval of competent authority.

-Sd-  
(Dr. Siva Reddy V)  
Director (Technical)



Invitation for Expression of Interest  
for empanelment of Training Centres for imparting  
training under  
“VARUNMITRA SKILL DEVELOPMENT  
PROGRAMME” in FY 2023-24

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## Section 1: Background

### 1.1 Introduction

National Institute of Solar Energy (NISE) is an Autonomous Institute of Ministry of New and Renewable Energy (MNRE), Government of India (GoI) to facilitate Research & Development (R &D), Testing, Certification and Skill Development activities in the areas of solar energy technologies in the Country.

Under the skill development initiatives of the MNRE, NISE is mandated as the nodal agency for implementation of “Solar Water Pumping Training Programme (Varunmitra). NISE is inviting Expression of Interest (EoI) for empanelment of Training Centres (Tc’s) for imparting training under Varunmitra.

### 1.2 About Varunmitra Skill Development Programme

Solar PV Water Pumping systems are one of the most useful applications of Solar Energy for meeting irrigation needs. Through the KUSUM scheme, Govt. aims to incentivize farmers to run Solar farm water pumps and use barren land for generating solar power. Installation of such a large number of Solar Pumps would need trained and skilled manpower for installation/commissioning as well as repair/maintenance. The objective of the present training programme is to impart knowledge and guidance in the design, installation, commissioning, safety, troubleshooting as well as operation & maintenance of the solar water pumping systems to create a pool of trained and skilled workforce which will be called as "VARUNMITRAS". This is a **3 weeks/21 days/120 hours** residential skill development programme following the Qualification Pack (QP) of SGJ/Q0112 details of the QP is available at [https://sscgj.in/wp-content/uploads/2016/10/Booklet\\_Qualification-Pack-SCGJ.pdf](https://sscgj.in/wp-content/uploads/2016/10/Booklet_Qualification-Pack-SCGJ.pdf).

The applicable National Occupational Standard (NOS) is SGJ/N0134 for the design, Installation, and Commissioning of Solar Water Pumping Systems. The preferable qualification for participants will be as per QP SGJ/Q0112. Special emphasis is to be given to the persons coming from rural backgrounds, **women**, unemployed youth, SC/ST category. The participants would be provided boarding and lodging facilities at the Training Centre (TC) by the Training Partner (TP). At the end of the course, Assessment and certification shall be done by the Skill Council for Green Jobs (SCGJ). Any change in the assessing body (SCGJ) shall be informed by NISE. The list of Equipment and Curriculum for conducting training under Varunmitra is attached as **Annexure 1-2**. NISE reserves the right to modify/change/update/amend/cancel the Expression of Interest (EoI) without specifying any reason. Any query related to this EoI can be sent to **e-mail** [eoI@nise.res.in](mailto:eoI@nise.res.in)

### 1.3 Important Date

The applicant (TP) has to submit application in online mode only and the applications submitted through any other mode shall not be considered. The link for online submission of application is available at <https://varunmitra.nise.res.in/Enrollment/Login> .

**Last date to submit the online application is 30/04/2024 up to 5:30PM**

## Section 2

### 2.1 Scope of work

NISE invites response document to this Expression of Interest for the selection of TCs to impart training under Varunmitra Skill Development Programme on PAN India basis against the programme sanctioned by MNRE for FY2023-24. Empanelled TCs may also be considered for FY2024-25 subject to the programme sanctioned by MNRE and also subject to the fulfilment of all qualifying conditions. As per present sanction all empanelled training centres to ensure completion of training by June 2025. However, this date may be extended subject to the receipt of sanction from MNRE.

### 2.2 Eligibility Criteria (All TCs must fulfil following criteria so as to be considered for further evaluation as per technical scoring criteria given at para 2.3).

- (i) The TC must be an Institute/ Engineering College/ Polytechnic College/ ITI/ NGO/Pradhan Mantri Kaushal Kendra (PMKK) or any other affiliated skill development centre with proper infrastructure as per para 2.5.
- (ii) TC must have training experience in the renewable energy/ solar energy.
- (iii) The TC must have Faculty with proper knowledge of Solar Water Pumping/ Solar Energy Programmes. To support this, a CV with relevant documents for each faculty must be submitted. The same requirements are applicable to guest faculty, if any.
- (iv) TC must have well equipped laboratory, classroom facilities and residential facilities as per para 2.5.
- (v) The institute must have Solar Water Pumping System facility for training like Fixed, Seasonal Tilt, Horizontal Axis Tracker and Dual Axis Tracker.
- (vi) The TC must provide all the required details in online application form as given below:

#### Online Application Form Part-A

A. Eligibility Conditions				
A.1		<b>Title of the Project</b>	Varunmitra Skill Development Programme for FY 2023-24	
A.2		<b>Name of TC</b>		
A.3		<b>Name of the Authorized Person of TC with Designation</b>		
A.4		<b>Address of the registered office and contact details of the TC</b>	<b>Address:</b> <b>Phone:</b> <b>Email:</b> <b>Pin:</b> <b>State:</b> <b>District:</b>	
A.5		<b>Legal status of the TC</b>	<i>(Attach proof of Certificate of Incorporation from the competent Authority)</i> <i>(Attach Copies of, PAN GST registration etc.)</i>	
A.6	<b>Annual Turnover</b>			
	<b>S. No.</b>	<b>FY Year</b>	<b>Annual Turnover (in rupees)</b>	<b>Upload Audited Balance Sheets</b>
	1			
	2			
	3			
		<b>Total</b>		

**A7. Detail of Training Centres (In a single PDF with the size less than 2MB)**

S.No	Name of TC	State	City	PIN	Full Address	Category of TC *	Ownership of infrastructure (Owned/Rent/Lease)	Attach proof
1								

Note\* : A) Government Institutes/Universities (Central/State/Deemed to be University/ Private University recognized by UGC)  
 B) Engineering College (Central/State/Private College approved by AICTE) Polytechnic (both private and government approved by designated state authority)/ ITI College (both private and government approved by NCVT/SCVT)  
 C) PMKK Centre/Other Skill Development Centre

**A8. Details of infrastructure (Center Wise)**

S.No	Center Name	No. of Classroom	No. of Labs	Upload File
1				

**B. Hostel Details**

Center Name	
Within Campus *	Yes <input type="button" value="v"/>
Upload Images * (In a single PDF with the size less than 2MB)	

**C. Solar Lab Infrastructure & Equipment**

Center Name	
Upload Images * (In a single PDF with the size less than 2MB)	* Photographs (at least 2 photographs is required with details of the equipment)
Upload List * (In a single PDF with the size less than 2MB)	* Upload the list of Tools and Equipment available with the training center as per Annexure 2 of EOI

**D. Total candidate trained in solar energy in the last 3 years (In a single PDF with the size less than 2MB)**

S.No	Center Name	Financial Year	Candidates Trained in Solar Energy	Attachment (Certificate Signed by CA)

E. Solar Water Pumping Facility & Installation	
Within Campus *	Yes <input type="button" value="v"/>
Upload Images * (In a single PDF with the size less than 2MB)	* Photographs (at least 2) and proof / Self Authorized letter along with location has to be submitted in case of nearby facility

## F. Trainers with relevant qualification and Experience

Sr. No	Name of the TC	Name of Trainer	Qualification (B.E./B.Tech. or Diploma (Electrical/Electronics/Civil/Mechanical) with 2years of relevant experience)	Institution	Total Experience as trainer in solar energy	Upload the CV	Upload relevant Documents ToT certificate, Degree, Experience Letter
1							
2							

### 2.3 Process of Shortlisting the TCs

- NISE will form a **Technical Evaluation Committee (TEC)** duly approved by the competent authority to evaluate the response submitted by the TCs against this EoI.
- The TEC will evaluate the responses submitted by the TCs as per following technical response scoring criteria:

#### Technical Scoring Criteria – maximum 100 marks

NATIONAL INSTITUTE OF SOLAR ENERGY			
" SOLAR PV ENGINEER (VARUNMITRA)" TRAINING PROGRAMME			
MARKING CRITERIA - 100 MARKS			
S. No.	Evaluation Criteria / Weightage	Maximum marks	Proof / Documents required
a	<b>Training Centre infrastructure facility</b>	20	Ownership document Valid rental/ lease deed
	Training Centre including classroom, labs etc. (i) Owned by the TC (20 marks) (ii) Rented/Lease (10 marks)		
b	<b>Hostel facility</b>	20	Geo-tagged image of hostel clearly showing the centre and hostel
	(i) within the campus (20 marks) (ii) outside the campus (10 marks)		
c	<b>No of qualified faculty per centre</b>	20	CV with relevant documents
	(i) No of qualified faculty per centre 2 (20 Marks) (ii) No of qualified faculty per centre 1 (10 Marks)		
d	<b>Total no of participants trained in Solar Energy in last 3 years</b>		Centre-wise number of participants trained and placed certified by CA and self-declared by Head/Authorized Person of the Centre
	(i) No. of Trained participants 401 and above (20 Marks) (ii) No. of Trained participants between 301 to 400 (16 Marks)		

	(iii) No. of Trained participants between 201 to 300 <b>(12 Marks)</b>	20	(Refer <b>Annexure-3</b> )
	(iv) No. of Trained participants between 101 to 200 <b>(8 Marks)</b>		
	(v) No. of Trained participants 50 to 100 <b>(4 Marks)</b>		
e	Availability of basic solar lab with Solar Water Pumping systems and related equipment	20	Photographs (at least 2 photographs is required with details of the equipment) as mentioned in point no 6 of “2.5 Infrastructure”
	<b>TOTAL</b>	<b>100</b>	

(c) based upon the evaluation/recommendation of the TEC as per above technical scoring criteria, state-wise merit list of the TCs will be prepared.

#### 2.4 Financials and Payment terms:

The present funding breakup for Varunmitra are as per the sanction letter received from MNRE, however it may vary time to time as per notification received from MNRE. The details of course fee, assessment charges and boarding & lodging sanctioned per participant is as below:

S.No.	Particulars	Description	Amount (in Lakh)
1	Course fee to the institute*	Rs 49/- per hour × 120 hours × 30 participants	1.764
2	Assessment charges	Rs 1000 per participant × 30 participants	0.300
3	Boarding and lodging** (**as per Classification ‘X’/‘Y’/‘Z’)	Rs 375 × 30 × 21 days (‘X’ cities)	2.362
		Rs 315 × 30 × 21 days (‘Y’ cities)	1.984
		Rs 250 × 30 × 21 days (‘Z’ cities)	1.575
	Rural Areas and any Area not notified as a municipal/town area	Rs 220 × 30 × 21 days	1.386

\*Base cost of rupees 49.00/per hour of training is taken as per the MSDE notification dated 1<sup>st</sup> January 2021.

\*\*Boarding charges will be adjusted as per actual expenditure on city classification as per details provided in MSDE Gazette notification 1<sup>st</sup> January 2021.

The course fee shall be **Rs. 53.90 (10% increase of base cost @ Rs 49)** per hour per participant as per details provided in MSDE Gazette notification 11<sup>th</sup> November 2020 for batches conducted in North Eastern States, Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Andaman & Nicobar Island, Lakshadweep and the districts affected by Left Wing Extremism (LWE) as identified by M/o Home Affairs.

**\*\*Categorization of Indian cities for Residential Training Costs**

Sr. No.	State	Cities classified as - X	Cities classified as -Y
1	Andhra Pradesh/ Telangana	Hyderabad (UA)	Vijayawada (UA), Warangal (UA), Greater Visakhapatnam (M.Corp.), Guntur (UA), Nellore (UA)
2	Assam	-	Guwahati (UA)
3	Bihar	-	Patna (UA)
4	Chandigarh	-	Chandigarh (UA)
5	Chhattisgarh	-	- Durg-Bhilai Nagar (UA), Raipur (UA)
6	Delhi	Delhi (UA)	-
7	Gujarat	Ahmadabad (UA)	Rajkot (UA), Jamnagar (UA), Bhavnagar (UA), Vododara (UA), Surat (UA)
8	Haryana	-	Faridabad (M.Corp.), Gurgaon (UA)
9	Jammu & Kashmir	-	Srinagar (UA), Jammu (UA)
10	Jharkhand	-	Jamshedpur (UA), Dhanbad (UA), Ranchi (UA), Bokaro Steel City (UA)
11	Karnataka	Bengaluru/Bengaluru (UA)	Belgaum (UA), Hubli-Dharwad (M.Corp.), Mangalore (UA), Mysore (UA), Gulbarga (UA)
12	Kerala	-	Kozhikode (UA), Kochi (UA), Thiruvananthapuram (UA), Thrissur (UA), Malappuram (UA), Kannur (UA), Kollam (UA)
13	Madhya Pradesh	-	Gwalior (UA), Indore (UA), Bhopal (UA), Jabalpur (UA), Ujjain (M.Corp.)
14	Maharashtra	Greater Mumbai (UA), Pune (UA)	Amravati (M.Corp.), Nagpur (UA), Aurangabad (UA), Nashik (UA), Bhiwandi (UA), Solapur (M.Corp.), Kolhapur (UA), Vasai-Virar City (M.Corp.), Malegaon (UA), Nanded- Waghala (M.Corp.), Sangli (UA)
15	Meghalaya	-	Shillong
16	Odisha	-	Cuttack (UA), Bhubaneswar (UA), Raurkela (UA)
17	Puducherry (Pondicherry)	-	Puducherry/Pondicherry (UA)
18	Punjab	-	Amritsar (UA), Jalandhar (UA), Ludhiana (M.Corp.)
19	Rajasthan	-	Bikaner (M.Corp.), Jaipur (M. Corp), Jodhpur (UA), Kota (M. Corp.), Ajmer (UA)
20	Tamil Nadu	Chennai (UA)	Salem (UA), Tiruppur (UA), Coimbatore (UA), Tiruchirappalli (UA), Madurai (UA), Erode (UA)
21	Uttar Pradesh	-	Moradabad (M.Corp.), Meerut (UA), Ghaziabad (UA), Aligarh(UA), Agra(UA), Bareilly (UA), Lucknow (UA), Kanpur (UA), Allahabad (UA), Gorakhpur (UA), Varanasi (UA), Saharanpur (M.Corp.), Noida (CT), Firozabad (NPP), Jhansi (UA)
22	Uttarakhand	-	Dehradun (UA)
23	West Bengal	Kolkata (UA)	Asansol (UA), Siliguri (UA), Durgapur (UA)



All other cities/towns in various States /UTs which are not covered by classification as “X” or “Y” are classified as “Z”.

The breakup of expenditure out of course fee shall be as follows:

- (a) Mobilization of participants
- (b) Curriculum
- (c) Training of Trainer
- (d) Equipment
- (e) Amortization of Infrastructure costs/ utilization
- (f) Teaching aid
- (g) Raw material
- (h) Salary of trainers and support staff
- (i) Varunmitra Handbook/ study material to each participant
- (j) Any other expenditure for imparting the training programme.

#### 2.4.1 Fund Flow Mechanism

Each programme should have 30 participants. Any revision of fee structure shall be based on MNRE approval, which shall be communicated accordingly. The funds will be released as per common norms of MNRE. Advance (50%) if requested by the TC shall be released against Bank Guarantee (BG) i.e. 50% of the total value of the fund as per norm. TC has to submit the documents for each programme such as: - Utilization Certificate (UC) in GFR 12A, statement of expenditure (SoE), attendance sheet, group photo, assessment & certification receipt, feedback forms, placement information, details of participants in the specified format (Aadhar number of participants is mandatory) and any other information required by NISE.

The schedule of release of payment will be based on MNRE sanction order. The funds should be released to the TCs as per the following schedule:

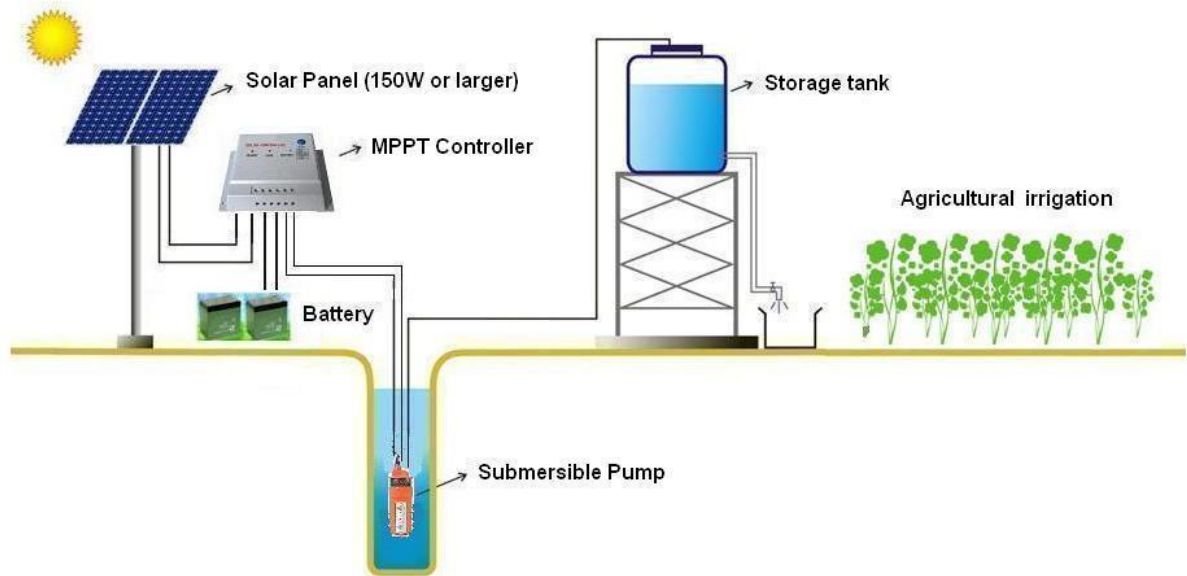
Installments	% of Installment of batch	Milestone
1st	50%	On Training Commencement.
2nd	50%	On completion of successful certification (Payment made for number of candidates certified after adjusting the advance payments)
No fund shall be released for dropout and failed participants		

#### 2.5 Infrastructure

1. A Class room to accommodate 30 participants with basic teaching aids- white board, tables and chairs for adequate sitting arrangement with audio & video facility.
2. Laboratory with minimum 300 sqft area to carryout hands on activities to understand the various concepts related to PV power generation.
3. Hostel facility with well-ventilated rooms and proper bedding arrangement to accommodate 30 participants. Separate arrangements for boy and girl participants should be made at the hostel premises.
4. Canteen facility with daily breakfast, lunch, dinner with two times tea for the participants. The dining area and food should be hygienic. Weekly menu should be fixed which includes local food dishes and seasonal green vegetables.
5. Availability of internet connectivity at the centre, necessarily at IT/ computer laboratory.
6. The institute must have following Solar Water Pumping Facility either in campus or access to such facility nearby for the practical/hands-on experience of the participants:

Sr. No	Item	Type
1.	Solar Water Pump & Motor	AC/DC (Submersible & Surface)
2.	PV Module array	As per pump capacity
3.	Pump Controller	As per Pump capacity and types of pump

		(AC/DC/BLDC)
4.	Wiring	As per Requirement
5.	PV module mounting Structure	With manual Tracking arrangements
6.	Water Source	Bore well/ tank (proper arrangement for submersible or surface pump tests)
7.	Multimeter	1
8.	Clamp meter	1
9.	Tool & Safety Kit	As per Annexure 2



7. The institute must have sufficient open space for conducting field work and experimentation.

## 2.6 General Information

- (a) The documents with its supporting evidences should be properly uploaded on portal.
- (b) The application with incomplete documents/ information will be out-rightly rejected and no correspondence for that will be entertained.
- (c) Applications of joint venture / consortium in any form shall not be considered.
- (d) The rent out of training is not allowed and will attract the cancellation of empanelment of TC.
- (e) **The Training Partners (TPs) who are applying for multiple Training centres (TCs) within a state/UT shall apply for one centre and also not more than 3 centres in total within the country.**
- (f) NISE will prepare a state-wise merit list of the training centres. If two or more training centres get the same marks in evaluation, then the order of selection preference will be as follows-
  - Government Institutes/Universities (Central/State/Deemed to be University/ Private University recognized by UGC)
  - Engineering College (Central/State/Private College approved by AICTE) Polytechnic (both private and government approved by designated state authority)/ ITI College (both private and government approved by NCVT/SCVT) PMKK Centre
  - Other affiliated Skill Development Centre affiliated from SCGJ/NSDC regarding solar training in academic setup (as mentioned above) shall be considered only.
- (g) **The applicant has to deposit an online processing fee (non-refundable) of Rs 5000/- for submitting application for one centre.**
- (h) The non-refundable fee will be submitted through CC Avenue link for the fee payment will

be available in the online application form.

- (i) The empanelled TC has to submit the yearly/ quarterly action plan with starting dates of the batches and details of participants in advance in the following format-

S. No.	Duration	Name of Candidate	Father's Name & Mother's Name	Date of birth	Permanent Address, email.id, Mobile No.	Physically Handicapped if any	Category (Gen/SC /ST/OBC)	Aadhar No.	Mobile. No	No. of Days attended / Total no. of days of training)	Grade	Photograph

- (j) TC has to provide Varunmitra Handbook/ study material to each participant from the course fee head of the project cost.
- (k) Aadhar Enabled Bio-metric System (AEBAS) and IP based camera system is to be used mandatorily at the training centre. The payment shall be released based on AEBAS attendance system or any other similar biometric attendance system in places where AEBAS is not applicable.
- (l) Court of Jurisdiction for any dispute will be Punjab and Haryana high court Chandigarh. The decision of the Competent Authority, NISE shall be final in all matters relating to eligibility, acceptance or rejection of application, mode of selection.

### **2.7 Termination**

The empanelment of the TC may be terminated at any point of time if any violation of norms is found during the implementation of the Varunmitra programme at its centres and accordingly performance bank guarantee shall not be returned.

## Annexure 1

### GENERAL INFORMATION FOR THE QUALIFICATION PACK

<b>1.</b>	<b>Name of the QP</b>	Solar PV Engineer (Varunmitra)
<b>2.</b>	<b>Sector</b>	Solar Energy/ Green Jobs
<b>3.</b>	<b>Qualification Pack</b>	SCG/Q0112 (SGJ/N0134)
<b>4.</b>	<b>Trainee Qualification</b>	Diploma (Electrical/Electronics/Civil/Mechanical) or pre-final engineering and technology candidate with 3 years of formal engineering education The participants working in the area of SPV pumps will be preferred.
<b>5.</b>	<b>Age</b>	Minimum age: 20
<b>6.</b>	<b>Terminal Competency</b>	After completion of Course Trainees may be able to: a. Know the basics of Solar Water Pumping Systems b. Operate Solar Water Pumping System & Maintain them c. Work for execution project d. Plan & Install Solar Water Pumping System e. Testing and Commissioning of Solar Water Pumping Plant
<b>7.</b>	<b>Duration</b>	120 hr
Topics as per Qualification Pack of Skill Council Green Jobs (SCG/Q0112(SGJ/N0134))		
DAY-1 (Monday) (First half) Welcome and Orientation		
DAY-1 (Monday) (Second half) Session 1A:		
Solar Energy Fundamentals	<b>Basics of Solar Energy</b> <ul style="list-style-type: none"> <li>• Insolation</li> <li>• solar resource assessment</li> <li>• Direct normal irradiation</li> <li>• Diffuse horizontal irradiation</li> <li>• Global horizontal irradiation and</li> <li>• Albedo effect</li> <li>• Solar Path</li> <li>• Angles (azimuthal, hour, altitude, zenith etc.)</li> </ul>	
<b>DAY-2 (Tuesday)</b>		
<b>Session 1 B:</b>		
Solar Energy Fundamentals	<b>Introduction to Solar Water Pumping System</b> <ul style="list-style-type: none"> <li>• Pump</li> <li>• Motor (AC/DC and Submersible/Surface)</li> <li>• Solar Panels / Modules</li> <li>• Controller</li> <li>• Structure</li> <li>• Remote Monitoring System</li> </ul>	

	<ul style="list-style-type: none"> <li>• Applications</li> </ul> <p><b>Practical</b> Working and construction of basic radiation measuring instrument:</p> <ul style="list-style-type: none"> <li>• Pyranometer,</li> <li>• Pyrheliometer,</li> <li>• Pyregeometer</li> <li>• Calculating azimuthal angle</li> </ul> <p>Calculating orientation of solar panels</p>
<b>DAY-3 (Wednesday)</b>	
<b>Session 2 A:</b>	
Solar Water Pumping Systems Technology	<p><b>Surface and Submersible Pumps</b></p> <ul style="list-style-type: none"> <li>• Surface Pumps</li> <li>• Submersible Pumps</li> <li>• AC Motor</li> <li>• DC Motor</li> </ul> <p><b>Practical Training</b> Working and explanation of pumps</p>
<b>DAY-4 (Thursday)</b>	
<b>Session 2 B:</b>	
Solar Water Pumping Systems Technology	<p><b>Solar Pump System Terminologies and Characteristics</b></p> <ul style="list-style-type: none"> <li>• Suction Head</li> <li>• Delivery Head</li> <li>• Static Head</li> <li>• Dynamic Head</li> <li>• Friction Losses</li> <li>• Effect of Tilt / Shading / Tracking</li> <li>• PV and IV Characteristics of Solar Water Pumps</li> <li>• Choice of Solar Water Pumping System</li> </ul> <p><b>Practical Training</b></p> <ul style="list-style-type: none"> <li>• <b>Case Study</b> on choice of Solar Water Pumping System</li> <li>• Calculation of heads and Losses</li> <li>• Shadow Analysis</li> </ul>
<b>Day-5 (Friday)</b>	
<b>Session 2 C:</b>	
Solar Water Pumping Systems Technology	<ul style="list-style-type: none"> <li>• <b>Understanding of B.O.S. Components</b></li> <li>• Controller (PWM and MPPT)</li> <li>• Inverter / VFD</li> <li>• Mounting Structure</li> <li>• Manual / Auto Tracking</li> <li>• Various type of tracking system and their usage</li> <li>• Remote Monitoring System (RMS)</li> <li>• Series and Parallel Connection of Solar Panels</li> </ul>

	<p><b>Practical Training</b></p> <ul style="list-style-type: none"> <li>• Working and field experience of BOS Components</li> <li>• Field Practice of Series and Parallel Connections</li> </ul>
DAY-6 (Saturday)	<b>Free</b>
Day-7 (Sunday)	<b>Free</b>
<b>Day-8 (Monday)</b>	
<b>Session 3:</b>	
Designing of Solar Water Pumping System	<ul style="list-style-type: none"> <li>• AutoCAD</li> <li>• PV*SYST</li> <li>• PV*SOL®</li> </ul> <p><b>Practical Training</b></p> <ul style="list-style-type: none"> <li>• AutoCAD</li> <li>• PV*SYST</li> <li>• PV*SOL®</li> </ul>
<b>Day-9 (Tuesday)</b>	
<b>Session 4:</b>	
System Integration	<p><b>Site Selection</b></p> <ul style="list-style-type: none"> <li>• Site handling</li> <li>• Analysis of water usage and level of water table at site</li> <li>• Crop water requirement</li> <li>• Availability of water and recharging frequency of water</li> <li>• Important Site Considerations</li> <li>• Water Source</li> </ul> <p><b>Practical Training</b></p> <ul style="list-style-type: none"> <li>• Drip/ Micro Irrigation</li> </ul>
<b>Day – 10 (Wednesday)</b>	
<b>Session 5:</b>	
Installation / Commissioning	<p><b>Bore Well/ Open Well / Stream Installation Procedure</b></p> <ul style="list-style-type: none"> <li>• Oversee the preparation of the foundation for solar module mounting structure and motor pump set</li> <li>• Design the plan of mounting structures and foundation</li> <li>• Ensure structure is fixed on the foundations</li> <li>• Mounting of solar modules</li> <li>• Oversee the connection of solar module array to pump set in case of DC pumps</li> <li>• Oversee the installation of inverter in case of AC pumps</li> <li>• Ensure protection system are in place</li> <li>• Perform inspection and testing of equipment</li> <li>• Perform start-up procedures and measure output</li> </ul>

	<ul style="list-style-type: none"> <li>• Compare the output with design output and take corrective actions, if required</li> <li>• Ensure connection of the solar module array to motor pump set through a Maximum Power Point Tracker (MPPT) to get maximum power from the array</li> </ul> <p><b>Practical Training</b></p>
<b>Day-11 (Thursday)</b>	
<b>Session 6:</b>	
MNRE Guidelines	<ul style="list-style-type: none"> <li>• Performance Specifications</li> <li>• Standards and guidelines</li> <li>• Warrantee Clause</li> <li>• Overview of MNRE Policies</li> </ul>
Testing of Solar PV Water Pumping System	<ul style="list-style-type: none"> <li>• Solar Pump Testing</li> <li>• Measurement of Efficiency</li> <li>• Quality Management</li> </ul> <p><b>Practical Training</b></p> <ul style="list-style-type: none"> <li>• Case Study</li> </ul>
<b>Day-12 (Friday)</b>	
<b>Session 7:</b>	
Documentation	<ul style="list-style-type: none"> <li>• JNNSM</li> <li>• KUSUM</li> <li>• Solar Policies of States</li> <li>• Subsidy</li> <li>• Loan Schemes</li> <li>• Liaising</li> <li>• Commissioning</li> </ul> <p><b>Practical Training</b></p> <ul style="list-style-type: none"> <li>• Case Study</li> </ul>
Day 13 (Saturday)	<b>Free</b>
Day 14 (Sunday)	<b>Free</b>
<b>DAY-15 (Monday)</b>	
<b>Session 8 A:</b>	
Operation & Maintenance	<p><b>Operation and Maintenance</b></p> <ul style="list-style-type: none"> <li>• Proper Operation procedure</li> <li>• Maintenance of Solar Water Pump System</li> <li>• Preventive Maintenance</li> <li>• Safety Practices</li> </ul> <p><b>Practical Training</b></p> <p>To be competent, the user/individual on the job must be able to operate the solar water pump ensure periodical cleaning of solar module array periodically ensure tightness of cable connections ensure periodic maintenance of motor pump set</p>
<b>DAY-16 (Tuesday)</b>	
<b>Session 8 B:</b>	

Operation & Maintenance	<ul style="list-style-type: none"> <li>• Trouble shooting</li> <li>• Do's and Don'ts</li> </ul> <p><b>Practical Training</b></p>
<b>DAY-17 (Wednesday)</b>	
<b>Session 9 A:</b> <i>(First Half)</i>	
Business Models	<ul style="list-style-type: none"> <li>• System's Viability</li> <li>• Stand Alone and Centralized Solar Pumping Systems</li> <li>• Financial Analysis &amp; Customer's needs</li> </ul>
<b>Day-17 (Wednesday)</b>	
<b>Session 9 B:</b> <i>(Second Half)</i>	
Business Aspects	Start-ups
<b>Day-18 (Thursday)</b>	
<b>Session 10:</b>	
Skills Development	<ul style="list-style-type: none"> <li>• <i>Core Skills</i></li> <li>• <i>Generic Skills</i></li> <li>• <i>Soft Skills</i></li> <li>• <i>Negotiation Skills</i></li> <li>• <i>Feedback</i></li> </ul>
<b>DAY-19 (Friday)</b>	
<b>Conclusion</b>	Assessment and Certification
<b>Day 20 (Saturday)</b>	<b>Free</b>
<b>Day 21 (Sunday)</b>	<b>Free</b>
Note: Any part or whole content and curriculum may be changes/ updated at any point of time based on the industry requirement under the directions of MNRE/NISE.	



## Annexure 2

### List of Tools& Equipment for a batch of 30 trainees:

Sr. No.	Name of Tools & Instruments	Quantity (Nos.)
1.	Tool kit	As per requirements
2.	Double ended flat spanner	2 set
3.	Double ended ring spanner	2 set
4.	Combination pliers	4
5.	Side cutting pliers	4
6.	Nose pliers	4
7.	Wire stripper	4
8.	Electrician knife	10
9.	Hack saw frame with blade	4
10.	Hand crimping tools	2
11.	Cable cutter	1
12.	Screw driver	4
13.	Water level	5
14.	Measuring tape	1
15.	Centre punch	1
16.	Standard wire gauge	1
17.	Vanier caliper	1
18.	Line dori	2
19.	Chisel	1
20.	Drill m/c	2
21.	Plumb bob	2
22.	Sprit level	2
23.	Flat file	2
24.	Round file	2
25.	Triangle file	2
26.	Hand saw	2
27.	PVC mallet	2
28.	Ball pin hammer	4
29.	Fuse puller	1
30.	Safety helmet	As per requirement
31.	Safety souse	As per requirement
32.	Safety belt	As per requirement
33.	Nose mask	As per requirement
34.	Safety goggles	As per requirement
35.	Ear plug	As per requirement
36.	PVC hand glove	As per requirement
37.	Cotton hand glove	As per requirement
38.	Reflective jacket	As per requirement
39.	First aid kit	As per requirement
40.	Gum boots	As per requirement
41.	Tong tester AC/DC	2
42.	Digital Multimeter	2
43.	Megger	2
44.	Earth tester	2
45.	Earthing Rod	1
46.	Soldering Iron & Flux	5
47.	Phase Sequence Meter	2
48.	Pyranometer (silicon based)	1

## Demo Equipment

Sr. No.	Name of Tool & Instrument
1.	Tool kit
2.	Double ended ring spanner
3.	Combination pliers
4.	Side cutting pliers
5.	Nose pliers
6.	Wire stripper
7.	Electrician knife
8.	Hack saw frame with blade
9.	Hand crimping tools
10.	Cable cutter
11.	Screw driver
12.	Water level
13.	Measuring tape
14.	Centre punch
15.	Standard wire gauge
16.	Vanier calipash
17.	Line dori
18.	Chisel
19.	Drill m/c
20.	Plumb bob
21.	Sprit level
22.	Flat file
23.	Round file
24.	Triangle file
25.	Hand saw
26.	Pvc mallet
27.	Ball pin hammer
28.	Fuse puller
29.	Safety helmet
30.	Safety souse
31.	Safety belt
32.	Nose mask
33.	Safety goggles
34.	Ear plug
35.	PVC hand glove
36.	Cotton hand glove
37.	Reflective jacket
38.	Tong tester AC/DC
39.	MULTIMETER
40.	Megger
41.	Erath tester
42.	End termination of power cable
43.	Cable tray Erection
44.	Structure with module mounting

**Annexure-3**

**Self-Declaration**

I, ..... (Name of the Authorized Person), ..... (Designation of the Authorized Person) ----- (Name and address of Training Centre), do hereby declare that the information provided herein in the online application form is true and correct to the best of my knowledge and belief and nothing has been falsely stated or concealed therein. I understand that if the said information as given in the application form is found false, at any stage the empanelment of the centre will be liable to be rejected.

Date:

Signature

(Name of the Authorized Person)  
Stamp