

## COURSE INFORMATION

### The Design and Installation of Off-Grid Photovoltaic (PV) Systems Training

#### Course Information

This course is offered to people who want to be able to:

- Design the Off-Grid PV systems that include solar PV modules, and Balance-of-System (BOS) equipments.
- Install, test and commission the above systems with the connection from the batteries to the building switchboard being undertaken by a suitably approved person. (Note: the electrical connection between the inverter and loads can only be undertaken by licensed electricians).

The course is based on the manual: “Design and Installation of Off-Grid PV Systems”. To successfully complete the course, each participant must show that he/she is competent in all the skills and tasks analysis.

MBIPV Project has appointed the Universiti Teknologi MARA (UiTM) as host, facilities-provider, lecturer-trainer-examiner and assessor for the OGPV course.

The course manual is divided into separate chapters covering the fundamentals up to systems design & sizing and performance. The participants will be given written assignment after the completion of each session. Participants will have time to discuss with the trainer if they need to understand further on the topics.

#### Assessment

The assessment is done as follows:

Written examination on the theory covering the fundamentals, components, design, sizing and performance. Practical examination covering the experiments, design, install, test and commission a suitable OGPV system along with oral assessment on related issues.

Other support activities shall be done to enhance the participants understanding about the subject, such as: practical applications; in-class exercises and tutorials; in-class presentations and written assignments.

There will be specific sessions where participants are given hands-on experiments and practical installations, measurements, testing and commissioning, cabling etc.

#### Written theory examination

On the final day there is an open book written examination on the theory that is divided as follows:

- Part A – covers the fundamentals at 50% marks to be completed in 2 hours; and
- Part B – covers the systems design & sizing at 50% marks to be completed in 2 hours.

Thus this gives a total of four (4) hours time limit and the final mark is the total from both parts. This test is done individually.

### Practical examination

On the second last day there is an open book practical examination covering:

- Design
- Install
- Test & Commission
- Acceptance

The candidates are grouped in two's and are given TWO (2) hours to complete the listed activities. At the end of the session, each group will be assessed and interviewed by the evaluators.

### Passing requirements

To pass, each candidate must satisfactorily pass **BOTH** theory and practical examinations. The breakdown of the theory and practical examination marks is as follows:

#### ***Theory***

<u>Marks (%)</u>	<u>Status</u>	<u>Outcome</u>
0 to 49	Fail	Recommended to retake entire course
50 to 69	Fail	Eligible to request a resit of the exam only
70 to 99	Provisional pass	Eligible to be given a PEA*
100	Provisional pass	Eligible for award of ISP certificate

\*Post Examination Assessment (PEA) – this is a set of unique assignments based on questions the participants get wrong. The PEA is unique for each individual participant and they are given one week to complete them and arrive at the examiners. The PEA's are then marked, and the final marks for the relevant participants are recalculated. The PEA's are only given to candidates who pass the practical examination.

#### ***Practical***

The assessment is done based on a set of acquired skills obtained during the course. The candidates will be assessed based on these skills and each candidate will be given a status of PASS/FAIL. This status is given to each candidate by the evaluators when the evaluators are satisfied that the candidate has meet the minimum criteria for passing covering:

- Design
- Install
- Test & Commission
- Acceptance

### ***Post Examination Assessment (PEA)***

To obtain a PASS on the PEA, marks are defined as follows:

<u>Marks (%)</u>	<u>Status</u>	<u>Verdict</u>
85 to 89	Pass	Eligible for award of ISP certificate
90 to 100	Pass	Eligible for award of ISP certificate and apply to become trainer

Final verdict

To get a full certificate, each candidate must obtain a PASS in BOTH the theory and practical examinations.

### ***Confidential Report***

Lastly, the trainer-examiner submits a complete report comprising: full details of the marks, details of where each participant did wrong, summary of the practical assessments, summary of the performance and participation of each participant and recommendations for the award of ISP certificates.

### **Pre-requisites for Course Admittance**

Prerequisites for participants:

- i. Age above 21 years.
- ii. At least holds a Diploma in Engineering in any discipline; or Diploma in the Physical Sciences; or possess certificate in any Electrical Competency skills.
- iii. Proficient in English and Mathematics.

As a minimum, all course participants should have the following skills:

- Some knowledge of safe work practices.
- Mathematics for solving standard problems.
- Reading for comprehending technical subject matter.

All course participants must be able to read, understand and converse comfortably in English.

It is preferred that the participants already have knowledge and skills in:

- Electricity, electrical terms, and common formulae.
- Working knowledge of tools and meters used in installation, and maintenance of electrical systems.
- Basic customer education and service practices.

Although having these skills is preferred, the participants can learn these skills during the course or with extra work prior to attending the course.

If there are potential participants that would like to attend the training and do not have these skills, the potential participants must discuss this with the organizer before this he/she is allowed to attend the course.

## Organisation of the Course

If a participant has responded to an advertised course then he/she must complete the attached application form and send it to the organizer (address on the form) and the participant will then be notified whether he/she is successful.

If there is no specified course date, then courses may be are conducted when a maximum of twelve (12) people have applied to do the course.

During the course all lunches and morning/afternoon teas will be provided by the organizer.

## Requirements of the Participant

Each participant shall bring:

- Notebook and/or paper for taking notes and doing exercises
- Writing utensils.
- Calculator (preferably scientific type with logarithmic functions).
- To wear suitable attire and correct footwear for physical work.

**Note:** The participant can bring his/her own multi-meter and other tools if needed. But all required tools will be provided by the host of the course.

***For the details of course fee, please refer to the Application Form.***

*Confirmation of the registration is upon receipt of payment. Please send the cheque or the payment slip together with the completed Application Form to :*

**Account No : 1051 4000 3299**  
**Bank's Name : Affin Islamic Bank Berhad, Cawangan UiTM, 40450 Shah Alam**  
**Pay to : Bendahari UiTM**  
**Being : Payment for PV Systems Design Course**  
**Swift code : AAIBBMYKL**  
**Address : The Design and Installation of Off-Grid PV Systems Training  
Photovoltaic Monitoring Centre  
Research Innovations on Sustainable Energy  
Institute of Science  
Universiti Teknologi MARA  
40450 Shah Alam  
Selangor Darul Ehsan, MALAYSIA  
(Attn : Training Administrator)  
Tel : 603-5521 1994  
Fax: 603-5521 1990**