

**Five-Day CEP Short Term course**

**On**

**Solar Photovoltaic Training for Technicians**

**18<sup>th</sup> – 22<sup>nd</sup> May, 2015**

**Venue:-**

**VMCC Seminar Hall,  
Room No. 11, 1<sup>st</sup> Floor,  
IIT Bombay**

**Course Coordinator**

**Prof. Chetan Singh Solanki**



**National Centre for Photovoltaic Research and Education**

**Indian Institute of Technology, Bombay**

## Schedule

**1<sup>st</sup> Day – 18<sup>th</sup> May, 2015**

<b>Time</b>	<b>Module</b>	<b>Title</b>	<b>Speaker</b>
8:30-9:00		Registration & Tea and Breakfast	
9:00-9:15		Introduction to NCPRE and Training Program	Prof. B.M. Arora
9:15-10:00	Lecture 1	Introduction to Renewable Energy and Solar PV	Prof. B.M. Arora
10:00-11:00	Lecture 2	Introduction to Solar Cells, Modules and Arrays	Prof. B.M. Arora
11:00-11:15		Tea	
11:15-12:00	Lecture 3	Basics of Electricity	Rajesh Farswan
12:00-1:00	Lecture 4	Solar Radiation Basics and Introduction to measuring devices	Shashwata Chattopadhyay
1:00-2:00		Lunch	
2:00-3:00	Lab 1	Identifying and measuring the parameters of a solar PV module in the field	Vaman, Sandeep, Ravi, Firoz, Chalapathi and Rambabu
3:00-3:45	Field 1	Field Measurement of PV Module parameters, temperature and radiation	Vaman, Sandeep, Ravi, Firoz, Chalapathi and Rambabu, Ritesh Upadhye (MEPC)
3:45-4:00		Tea	
4:00-4:45	Field 2	Series and Parallel connections of PV modules	Vaman, Sandeep, Ravi, Firoz, Chalapathi and Rambabu, Ritesh Upadhye (MEPC)
4:45-5:30	Classroom	Calculations of Field Modules 1 and Discussion	Vaman Kuber, Sandeep, Ravi and Participants

## Schedule

2<sup>nd</sup> Day – 19<sup>th</sup> May, 2015

Time	Module	Title	Speaker
9:30-10:30	Lecture 5	PV Array Layout and Energy Yield	Vaman Kuber
10:30-11:00		Tea	
11:00-12:00	Lab 2	Monitor effect of sun tracking on energy generation	Vaman, Sandeep, Ravi, Firoz, Chalapathi and Rambabu
12:00-1:00		Lunch	
1:00-2:00	Quiz 1	Quiz - Day 1 Topics	Vaman Kuber, Sandeep, Ravi and Participants
2:00-2:45	Lecture 6	Battery Basics and Parameters	Rajesh Farswan
2:45-3:30	Lecture 7	Charge Controller Basics and Parameters	Vaman Kuber
3:30-4:00		Tea	
4:00-5:00	Field 3	Solar DC LED Street Light Operation and Monitoring	Vaman, Sandeep, Ravi, Firoz, Chalapathi and Rambabu
5:00-5:30	Classroom	Calculations of Field 3 module and Discussions	Vaman Kuber, Sandeep, Ravi and Participants

## Schedule

3<sup>rd</sup> Day – 20<sup>th</sup> May, 2015

Time	Module	Title	Speaker
9:30-10:30	Lecture 8	Inverter Basics and Parameters	Vaman Kuber
10:30-11:00		Tea	
11:00-12:00	Lab 3	PV Module Lab Tour	Vaman, Sandeep, Ravi, Firoz, Chalapathi and Rambabu
12:00-1:00		Lunch	
1:00-2:00	Quiz 2	Quiz - Day 2 Topics	Vaman Kuber, Sandeep, Ravi and Participants
2:00-3:00	Lecture 9	System Basics and Sizing	Vaman Kuber
3:00-4:00	Field 4	Solar AC LED Street Light Operation and Efficiency Monitoring	Vaman, Sandeep, Ravi, Firoz, Chalapathi and Rambabu
4:00-4:30		Tea	
4:30-5:30	Exercise 1	System Sizing Exercise	Vaman Kuber, Sandeep, Ravi and Participants

## Schedule

4<sup>th</sup> Day –21<sup>st</sup> May, 2015

Time	Module	Title	Speaker
9:30-10:15	Lecture 10	PV power plant Safety, Assembly, Installation and Testing Processes, Tools and Equipment	Dr. Vinay Hasabnis (Savitra Solutions)
10:15-10:30		Tea	
10:30-11:30	Field 5	PV Panel Assembly	Vaman, Sandeep, Ravi, Firoz, Chalapathi and Rambabu, Ritesh Upadhye (MEPC)
11:30-12:15	Lecture 11	DC and AC BoS Components	Dr. Vinay Hasabnis (Savitra Solutions)
12:15-1:00		Lunch	
1:00-2:00	Quiz 3	Quiz - Day 3 Topics	Vaman Kuber, Sandeep, Ravi and Participants
2:00-3:00	Lecture 12	Installation, Testing, Maintenance and Safety of Batteries, Charge Controllers and Inverters	Dr. Sudesh Bhagwat (MG Solar Powertronics)
3:00-5:30	Visit	Field Visit to MG Solar Powertronics	Vaman Kuber, Dr. Vinay Hasabnis, Dr. Sudesh Bhagwat and Participants

## Schedule

**5<sup>th</sup> Day – 22<sup>nd</sup> May, 2015**

<b>Time</b>	<b>Module</b>	<b>Title</b>	<b>Speaker</b>
9:30-10:30	Field 6	DC Cables, PV String Assembly and Inverter Testing	Vaman, Sandeep, Ravi, Firoz, Chalapathi and Rambabu, Ritesh Upadhye (MEPC)
10:30-11:00		Tea on Terrace	
11:00-12:00	Field 7	AC Cables, ACDB Operation, Energy Metering, Power Evacuation and Communication	Vaman, Sandeep, Ravi, Firoz, Chalapathi and Rambabu, Ritesh Upadhye (MEPC)
12:00-1:00	Lecture 13	PV Power Plant Operation and Maintenance (O&M Checks)	Ritesh Upadhye, MEPC
1:00-2:00		Lunch	
2:00-3:00	Field 8 and Classroom	Plant, Solar and Weather Monitoring and SCADA Demonstration	Vaman, Sandeep, Ravi, Firoz, Chalapathi and Rambabu, Ritesh Upadhye (MEPC)
3:00-4:00	Classroom	Discussion on Field Experience	Vaman Kuber, Dr. Vinay Hasabnis, Dr. Sudesh Bhagwat and Participants
4:00-4:30		Tea	
4:30-5:00	Classroom	Feedback and Certificate Distribution	Prof. B.M. Arora, Vaman Kuber