



"Shri Gajanan Maharaj Prasanna"

**P. R. Pote Patil Edu. & Welf. Trust's, Group of Institutions,
College of Engineering & Management, Amravati**

Institute Code : 1107

(Recognized by AICTE, New Delhi, Approved by Govt. of Maharashtra & Affiliated to SGBAU, Amravati)



- Kathora Road, Amravati, Maharashtra, India
- Ph. No. : +91-721-2970110, Fax No. : +91-721-2530089, Email : prpoteatilcollege@gmail.com
- Web. : www.prcem.org, www.prpatilcollege.org

Report of Title: **Training Program on Renewable Energy**

1	Title of Workshop	Rooftop Solar PV System
2	Date of Workshop	6-01-2020 to 15-01- 2020
3	Venue of Workshop	Computer Center, EE Dept.
4	Resource Person	Mr. Ravindra Sharma, Director, Autosys Indore
5	Target of Students	Electrical Students
6	Number of Students/Participants	60
7	Schedule of Program	PFA
8	Topics Covered	Understanding solar cell parameter Solar PV System Design and Integration Selecting the solar PV system components Balance-of-System (BOS) of solar Power Plant Project assignment & Discussion
9	Mode Assessment	Project Assignment
10	Outcome of workshop/FDP/Seminar /webinar	1. Demonstrate knowledge of and apply key solar electric



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		system terms and concepts. 2. Size and design a photovoltaic system. 3. Mount, ground, position, install, wire and connect a photovoltaic system. 4. Test voltage generated by photovoltaic system Operate & Maintain of Solar Power. 5. Participants will learn different types of solar PV module and batteries used in solar PV plant. 6. Design of solar PV Plant based on estimated loads.
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Schedule of Program

Date	Day	Session	Time	Contents
6/01/2020	Monday	I	2:00pm-5.00pm	Understanding solar cell parameter
7/01/2020	Tuesday	I	2:00pm-5.00pm	Understanding solar cell parameter



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8/01/2020	Wednesday	I	2:00pm-5.00pm	Solar PV System Design and Integration
9/01/2020	Thursday	I	2:00pm-5.00pm	Solar PV System Design and Integration
10/01/2020	Friday	I	2:00pm-5.00pm	Selecting the solar PV system componen
11/01/2020	Saturday	I	2:00pm-5.00pm	Selecting the solar PV system componen
13/01/2020	Monday	I	2:00pm-5.00pm	Balance-of-System (BOS) of solar Power Plant
14/01/2020	Tuesday	I	11.00am-2.00pm 2:30pm-5.30pm	Balance-of-System (BOS) of solar Power Plant and Project Discussion
15/01/2020	Wednesday	I	2:00pm-5.00pm	Project assignment & Discussion



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P.R. Pote Patil College of Engineering and Management, Amravati
Department of Electrical engineering



Academic Year 2019-20

Report on

Training Program on Renewable Energy: Rooftop Solar PV System

**P.R. Pote Patil**
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Education & Welfare Trust's



Workshop
on
Rooftop Solar PV System



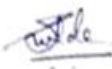
Date: 06 January
to
15 January 2020

-: Convenor :-
Dr. S.B. Warkad
Prof. A.K. Duchakke



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Name of course: Training Program on Renewable Energy: **Rooftop Solar PV System**

Nature of course: Certificate Program

Course Duration: 30 Hours

Career opportunity:

1. Design Engineer - Solar
2. Become entrepreneur / self employed.
3. Area Sales Manager-Solar Thermal & PV Products.

Course Objectives

1. To facilitate the students to achieve a clear conceptual understanding of technical and commercial aspects of Solar Power Development and Management.
2. To enable the students to develop managerial skills to assess feasibility of alternative approaches and drive strategies regarding Solar Power Development and Management.

Course Outcomes

On completion of this course, the students will be able to exhibit

- CO1. Conceptual knowledge of the technology, economics and regulation related issues associated with solar power development and management
- CO2. Ability to analyse the viability of solar power projects
- CO3. Capability to integrate various options and assess the business and policy environment regarding solar power projects
- CO4. Advocacy of strategic and policy recommendations on usage of solar power

Outcome of workshop: Upon completion of this course, the student will be able to:

7. Demonstrate knowledge of and apply key solar electric system terms and concepts.
8. Size and design a photovoltaic system.
9. Mount, ground, position, install, wire and connect a photovoltaic system.
10. Test voltage generated by photovoltaic system Operate & Maintain of Solar Power.
11. Participants will learn different types of solar PV module and batteries used in solar PV plant.
12. Design of solar PV Plant based on estimated loads.

Duration of course : 6th to 15th Jan 2020

Resource person : Mr. Ravindra Sharma, Director, Autosys Indore
Dr.S.B.Warkad



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Prof.A.K.Duchakke

Target participants : Electrical Engineering Students.

Course Structure and Syllabus

This is a skill oriented course in the study of solar photovoltaic (PV) cells, modules, and system components; electrical circuits; PV system design and sizing for use on homes, commercial building etc., understanding energy conversion from sunlight to electricity, and working with solar conversion equipment.

Course Contents :

- Understanding solar cell parameter [5Hrs]
- Solar PV System Design and Integration [5 Hrs]
- Selecting the solar PV system components [5Hrs]
- Balance-of-System (BOS) of solar Power Plant [5Hrs]
- Project assignment & Discussion [10 Hrs]

Course Mapping with POs:

Workshop								Academic Year: 2019-20				
Course/Subject: TRAINING on Renewable Energy: Rooftop Solar PV System												
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	2	2	1	2	1	3	3	-	-	-
CO2	2	3	2	2	1	1	1	1	2	-	-	-
CO3	2	2	3	2	1	2	1	2	1	-	-	-
CO4	1	2	2	3	1	3	1	3	2	-	-	-
Avg	2	2	2	2	1	2	1	2	2	-	-	-



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Date: 02/01/2020

Office Order

The undersigned is pleased to appoint the following staff members of Electrical Engineering Department as **Coordinator and Co-coordinator** for Add-on course on “**Training Program on Renewable Energy: Rooftop Solar PV System**” from 6th to 15th Jan 2020. You are therefore expected to take responsibility of coordinating the related activities & cooperate.

Sr No.	Faculty	Responsibility
01	Mr. Ravindra Sharma	Resource person
02	Dr.S.B.Warkad	Co-coordinator
03	Prof.A.K.Duchakke	Co-coordinator

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Prof. D. A. Shahakar

HOD (EE Dept)



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Department of Electrical Engineering

Academic Year 2019-20

NOTICE

Date: 02/01/2020

All the IVth Year students of Department of Electrical Engineering are hereby informed that, our department is going to organize Training Program on **“Training Program on Renewable Energy: Rooftop Solar PV System”** from 6th to 15th Jan 2020. All the students are hereby informed that they have to register for the workshop.

Prof. D.A. Shahakar

HOD(EE)




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Snapshots of Workshop



Theory session



Understanding the Solar Panel



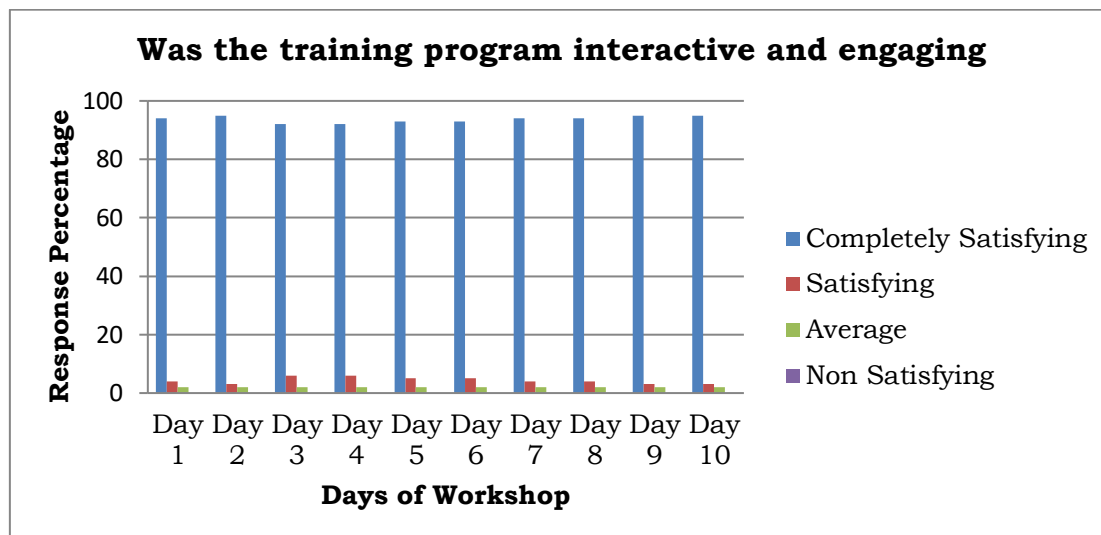
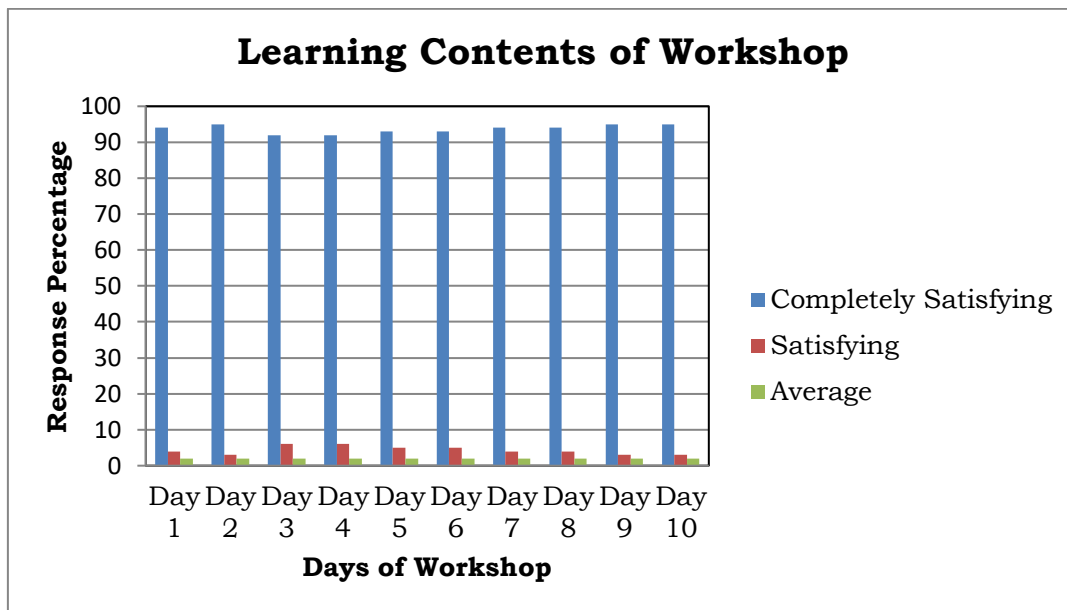
Practical session of Program



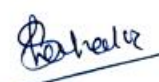
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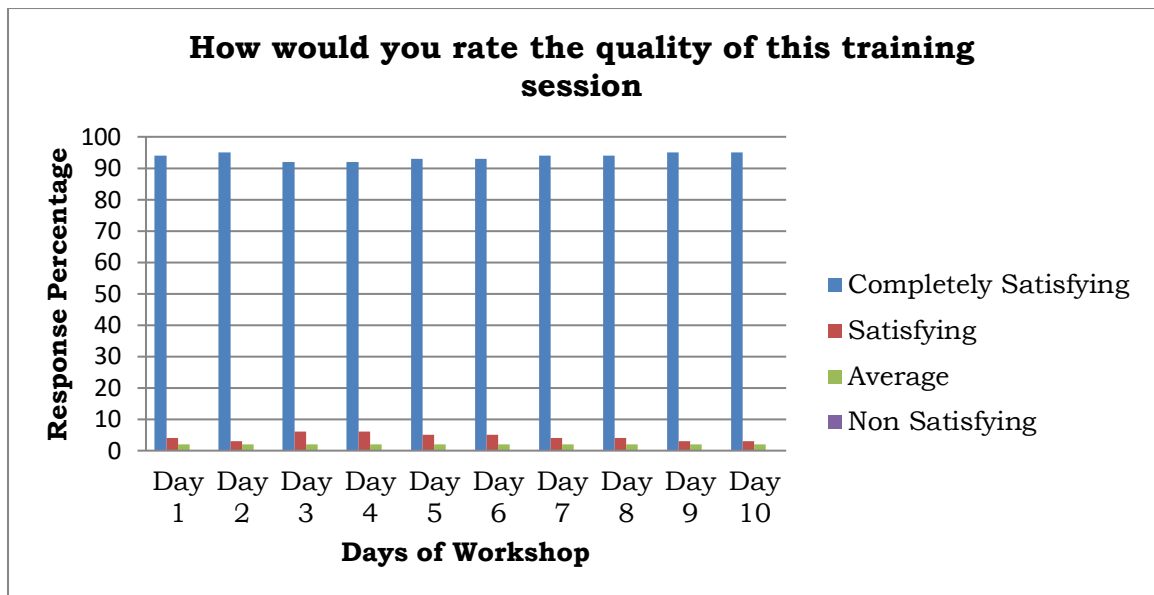
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Feedback of workshop




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Feedback of the Workshop



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Quiz

1. A solar cell converts light energy into _____

- a) Electrical energy b) Thermal energy c) Sound energy d) Heat energy

Answer: a

Explanation: A solar cell converts light energy into electrical energy. The light energy excites the electron of the solar cell which further flows in the circuit and constitutes the electric current.

2. There are three types of the solar cells.

- a) True b) False

Answer: a

Explanation: There are three types of solar cells. Single crystal, polycrystal, and amorphous silicon cells are the major types of solar cells.

3. Series and parallel combination of the solar cell is known as _____

- a) Solar array b) Solar light c) Solar sight d) Solar eye

Answer: a

Explanation: Series and parallel combination of the solar cell is known as Solar array. Shunt diodes are used to avoid the circulating current.

4. Full form of FF in the solar field is _____

- a) Form factor b) Fill factor c) Face factor d) Fire factor

Answer: b

Explanation: FF stands for Fill factor. It is the ratio of the maximum obtainable power to the product of the open-circuit voltage and short circuit current.

5. Calculate Fill factor using the data: $P_{max}=15\text{ W}$, $V_{oc}=18\text{ V}$, $I_{sc}=4\text{ A}$.

- a) .65 b) .59 c) .20 d) .98

Answer: c

Explanation: Fill factor is the ratio of the maximum obtainable power to the product of the open-circuit voltage and short circuit current. $F.F = P_{max} \div (V_{oc} \times I_{sc}) = 15/72 = .20$.

6. Material used for making solar cell is _____

- a) Silicon b) Carbon c) Sodium d) Magnesium

Answer: a

Explanation: Material used for making solar cells is Silicon. It is a naturally obtained semi-conductor. It has a lower cut-off voltage and minimum energy bandgap.

7. The term photo voltaic comes from _____



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a) Spanish b) Greek c) German d) English

Answer: b

Explanation: The term photo voltaic comes from Greek word phos means light. The volt is the unit of emf which was named after inventor of the battery.

8. A typical output of a solar cell is

A. 0.1 V **B. 0.26 V** C. 1.1 V D. 2 V

9. The efficiency of a solar cell may be in the range

A. 2 to 5% **B. 10 to 15%** C. 30 to 40% D. 70 to 80%

10. A module in a solar panel refers to

a. Series arrangement of solar cells.

b. Parallel arrangement of solar cells.

c. Series and parallel arrangement of solar cells.

d. None of the above.



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Sr. No.	Name	Marks[10]	Sr. No.	Name	Marks[10]
1	Rohini K. Deshmukh	8	44	Akansha A. Shrisath	7
2	Priyanka M. Parale	7	45	Sonali D. Kalaskar	7
3	Vaibhav H. Wakle	9	46	Rahul V. Manekar	8
4	Akash V. Kaldate	8	47	Rushikesh M. Gujarkar	9
5	Akshay M. Chaudhari	7	48	Akshay R. Pachpohe	8
6	Amruta S. Chaudhary	8	49	Aman A. Deole	7
7	Amruta G. Bhalerao	9	50	Kalyani P. Kawane	7
8	Radhika N. Mendhe	7	51	Jigisha P. Hirpurkar	8
9	Pranjali P. Bhise	8	52	Arpit R. Wardhe	7
10	Sakshi U. Hande	8	53	Prathamesh V. Aherkar	9
11	Onam Y. Wghmare	8	54	Vaibhav Dhakare	3
12	Payal S. Walde	9	55	Shatakshi R. Guhe	8
13	Sandesh P. Chaudhari	7	56	Dhanashree Pohokar	7
14	Jagdish S. Shinde	4	57	Shrutika V. Dabhale	9
15	Swapnil B. Ramteke	8	58	Pooja S. Kamble	7
16	Ashwin Y. Gahane	7	59	Mayuri D. Kapse	8
17	Gaurav S. Zopate	9	60	Sapna L. Kale	7
18	Tushar K. Kuyate	7	61	Samiksha R. Gathe	9
19	Madhvi K. Ingle	7	62	Bhagyashri S. Kale	9
20	Neha L. Neware	8	63	Mandar Pathak	8
21	Monika V. Ghatol	8	64	Ankit Prakash Deshmukh	8
22	Asha P. Bodkhe	3	65	Prasad Shankar Kharat	7
23	Vasanti A. Opase	9	66	Prasad Raju Kathalkar	8
24	Snehal M. Wanare	8	67	Ujwal Vijayrao Talkit	4
25	Pallavi R. Rajgure	7	68	Anant Dinesh Kurywanshi	7
26	MD. Umer Mohammad Iqbal	6	69	Vrusha Nandu Ahirrao	7



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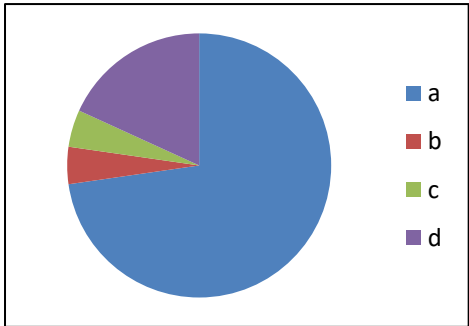
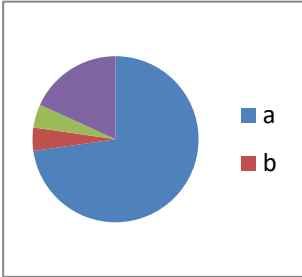
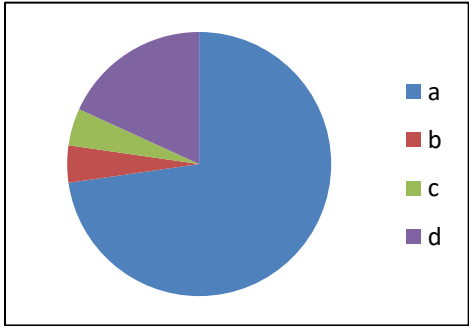
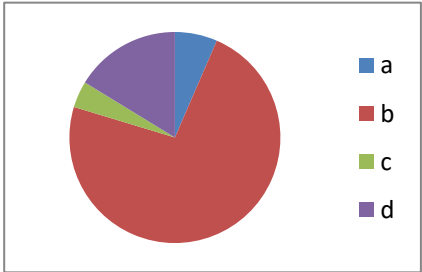
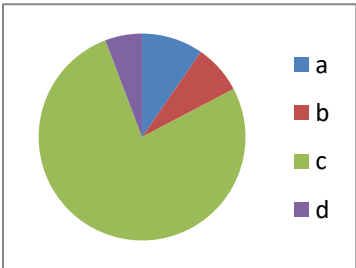
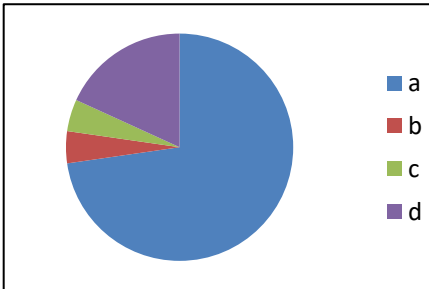
27	Harsh N. Dhawale	8	70	Harshal Ramesh Ingalkar	8
28	Yash S. Malthane	7	71	Manish Santosh Pawade	7
29	Sanghadip R. Wasnik	7	72	Abhishek Khedkar	9
30	Charudatta K. Wakudkar		73	Revati Niranjandrao Ganorkar	8
31	Kamesh M. Thakre	6	74	Dikshant Anil kawade	7
32	Nikhil S. Dharme	8	75	Rhushikesh Madhukar Sabal	8
33	Nishikant J. Kale	9	76	Sonam R Chikhalkar	7
34	Ameya N. Adsule	8	77	Dushant girde	8
35	Vicky P. Gaikwad	7	78	Anurag K. Bhoyar	7
36	Prashant S. Umkar	8	79	Shabdali Mule	7
37	Shubham S. Wankhade	7	80	Neha Suresh Bendarkat	9
38	Abhay S. Gedam	8	81	Makarand Vinod Bhamburkar	8
39	Anand S. Jadhav	7	82	Shubham P. Tandiye	9
40	Omkareshwari B. Khupse	7	83	Rushikesh Ramkrushna Bhakte	8
41	Pooja K. Kamble	7	84	Rasika Sunil Jagtap	8
42	Rupesh V. Aagde	9	85	Pranjal Dilip Dubey	7
43	Himanshu S. Umale	8			



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Quiz Responses

1. A solar cell converts light energy into _____ 	2. There are three types of the solar cells. 
3. Series and parallel combination of the solar cell is known as _____ 	4. Full form of FF in the solar field is _____ 
5. Calculate Fill factor using the data: $P_{max}=15\text{ W}$, $V_{oc}=18\text{ V}$, $I_{sc}=4\text{ A}$. 	6. Material used for making solar cell is _____ 
7. The term photo voltaic comes from _____	8. A typical output of a solar cell is _____



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9. The efficiency of a solar cell may be in the range		10. A module in a solar panel refers to		



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Sample Certificate



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AutoSys
Indore

CERTIFICATE

*This is to certify that, Mr. / Ms. Prasad A. Raut, III Year Student of
Electrical Engineering Department has completed Training Program on "
Renewable Energy: Rooftop Solar PV System" organized by Department of
Electrical Engineering P. R. Pote (Patil) College of Engineering &
Management, Amravati,, during 06/01/2020 to 15/01/2020*

Dr. S.B. Warkad
IQAC Coordinator

Prof. D.A. Shahakar
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