

## Report On

### Faculty Development Program on

## “RECENT TRENDS IN RENEWABLE ENERGY”

02-08-2021 to 06-08-2021

Virtually at K R Mangalam University, Sohna Road, Gurgaon

To upgrade and revamp the knowledge of faculties, research scholar and industrial persons. A one-week Faculty Development Program (FDP) was organized at K R Mangalam University, Sohna Road, Gurgaon, over the theme of **Recent Trends in Renewable Energy**, from **02 Aug, 2021 to 06 Aug. 2021**, on a **virtual platform** of Microsoft Teams Meet.

The FDP program received good response with more than 100 participants from various institutes/colleges. The FDP addresses present day trends prevailing in Renewable Energy Machineries and promotes student centric effective teaching-learning pedagogy among the participants. This course was aimed for teachers who are teaching various disciplines of science and engineering subjects in colleges or Universities.

Resource Persons from reputed academic institutions like Aarhus University (Denmark), Curtin University (Malaysia), Association of Cultivation of Science (Kolkata), National Institute of Solar Energy (Gurugram), Anna University (Chennai), Delhi Technological University (New Delhi), Government Engineering College Patan (Gujarat), National Institute of Technology (Hamirpur), KLEF University (A.P.), Chandigarh University (Chandigarh), Northcap University (Gurugram) have contributed their research findings and expertise. A mix blend of academics and industry having capability in the different relevant areas related to the programme contributed in Faculty Development Programme

The Programme also intends to develop the knowledge of participants in various engineering field such as: E-vehicles, simulation with advanced software in the relevant field for inculcating learning values in students and guiding and monitoring their progress. The FDP was attended by more than 60 participants averagely over daily sessions. Participants are faculty members of ECE, EE, CSE, IT, CE, Physics, Mathematics department and PG students.

The brochure is divided into several sections:

- Left Panel:** Contains the K.R. Mangalam University logo, a brief description of the FDP, and contact information.
- Center Panel:** Features the title "RECENT TRENDS IN RENEWABLE ENERGY" and a list of resource persons from various institutions.
- Right Panel:** Displays a detailed 5-day schedule of the FDP, organized by the School of Engineering and Technology.

## FDP BROCHURE

Initial Invitation was circulated all over the platforms available:

Dear All

“School of Engineering and Technology is pleased to organize online **Faculty Development Program (FDP)** at our University (virtual mode) on **Recent Trends in Renewable Energy (RTIRE)** from **2/8/2021 to 6/8/2021**. It aims at providing platform where students, researchers, academicians and Industry persons from Pan India and abroad will attend and gain knowledge in emerging technologies in the areas of AI along with Renewable Energy. We have invited distinguished speakers from academics, research, and industry to deliver talk. We look forward for your active participation. You are requested to circulate the brochure of both the FDPs in your group to make this event a great success.”

The tentative schedule for the FDPs attached herewith the report. Apart From this Following faculties will be involved in other duties:

1. **Feedback form and Quiz-** Ms. Minakshi Katoch
2. **Whatsapp group** of participants/Link creation/day wise link was posted- Mr. Surendra Kumar Yadav
3. **Certificate** - Mr. ShriRam/ Ms. Sarah Khan
4. **Finance** -Dr. Vineet Dahiya/Mr. Manish Kumar
5. **Overall Technical Glitch Issues** was managed Mr. Bhavesh Vyas/Mr. Rishabh Arora
6. **Valedictory Session** was managed Ms. Puja Acharya/Ms. Gauri Aglave
7. **Other Work:** Dr. Kaushal Kumar/Mr. Arvind Kumar

Day wise Links for MS Team are provided hereby:

S. No.	MS-Team Meeting Link
Day - 1	<a href="https://teams.microsoft.com/l/meetup-join/19%3ameeting_OT10MzhlMzctZWQwMC00NzhILWE4MzYtNzA0NmY4NzI5NjMy%40thread.v2/0?context=%7b%22Tid%22%3a%2238fd5a4b-955f-455a-9ad2-d2daa5a4e4d0%22%2c%22Oid%22%3a%22c99a4b63-fca7-49d8-9769-7822f505d6ec%22%7d">https://teams.microsoft.com/l/meetup-join/19%3ameeting_OT10MzhlMzctZWQwMC00NzhILWE4MzYtNzA0NmY4NzI5NjMy%40thread.v2/0?context=%7b%22Tid%22%3a%2238fd5a4b-955f-455a-9ad2-d2daa5a4e4d0%22%2c%22Oid%22%3a%22c99a4b63-fca7-49d8-9769-7822f505d6ec%22%7d</a>
Day - 2	<a href="https://teams.microsoft.com/l/meetup-join/19%3ameeting_OT10MzhlMzctZWQwMC00NzhILWE4MzYtNzA0NmY4NzI5NjMy%40thread.v2/0?context=%7b%22Tid%22%3a%2238fd5a4b-955f-455a-9ad2-d2daa5a4e4d0%22%2c%22Oid%22%3a%22c99a4b63-fca7-49d8-9769-7822f505d6ec%22%7d">https://teams.microsoft.com/l/meetup-join/19%3ameeting_OT10MzhlMzctZWQwMC00NzhILWE4MzYtNzA0NmY4NzI5NjMy%40thread.v2/0?context=%7b%22Tid%22%3a%2238fd5a4b-955f-455a-9ad2-d2daa5a4e4d0%22%2c%22Oid%22%3a%22c99a4b63-fca7-49d8-9769-7822f505d6ec%22%7d</a>
Day - 3	<a href="https://teams.microsoft.com/l/meetup-join/19%3ameeting_OT10MzhlMzctZWQwMC00NzhILWE4MzYtNzA0NmY4NzI5NjMy%40thread.v2/0?context=%7b%22Tid%22%3a%2238fd5a4b-955f-455a-9ad2-d2daa5a4e4d0%22%2c%22Oid%22%3a%22c99a4b63-fca7-49d8-9769-7822f505d6ec%22%7d">https://teams.microsoft.com/l/meetup-join/19%3ameeting_OT10MzhlMzctZWQwMC00NzhILWE4MzYtNzA0NmY4NzI5NjMy%40thread.v2/0?context=%7b%22Tid%22%3a%2238fd5a4b-955f-455a-9ad2-d2daa5a4e4d0%22%2c%22Oid%22%3a%22c99a4b63-fca7-49d8-9769-7822f505d6ec%22%7d</a>
Day - 4	<a href="https://teams.microsoft.com/l/meetup-join/19%3ameeting_OT10MzhlMzctZWQwMC00NzhILWE4MzYtNzA0NmY4NzI5NjMy%40thread.v2/0?context=%7b%22Tid%22%3a%2238fd5a4b-955f-455a-9ad2-d2daa5a4e4d0%22%2c%22Oid%22%3a%22c99a4b63-fca7-49d8-9769-7822f505d6ec%22%7d">https://teams.microsoft.com/l/meetup-join/19%3ameeting_OT10MzhlMzctZWQwMC00NzhILWE4MzYtNzA0NmY4NzI5NjMy%40thread.v2/0?context=%7b%22Tid%22%3a%2238fd5a4b-955f-455a-9ad2-d2daa5a4e4d0%22%2c%22Oid%22%3a%22c99a4b63-fca7-49d8-9769-7822f505d6ec%22%7d</a>
Day - 5	<a href="https://teams.microsoft.com/l/meetup-join/19%3ameeting_OT10MzhlMzctZWQwMC00NzhILWE4MzYtNzA0NmY4NzI5NjMy%40thread.v2/0?context=%7b%22Tid%22%3a%2238fd5a4b-955f-455a-9ad2-d2daa5a4e4d0%22%2c%22Oid%22%3a%22c99a4b63-fca7-49d8-9769-7822f505d6ec%22%7d">https://teams.microsoft.com/l/meetup-join/19%3ameeting_OT10MzhlMzctZWQwMC00NzhILWE4MzYtNzA0NmY4NzI5NjMy%40thread.v2/0?context=%7b%22Tid%22%3a%2238fd5a4b-955f-455a-9ad2-d2daa5a4e4d0%22%2c%22Oid%22%3a%22c99a4b63-fca7-49d8-9769-7822f505d6ec%22%7d</a>

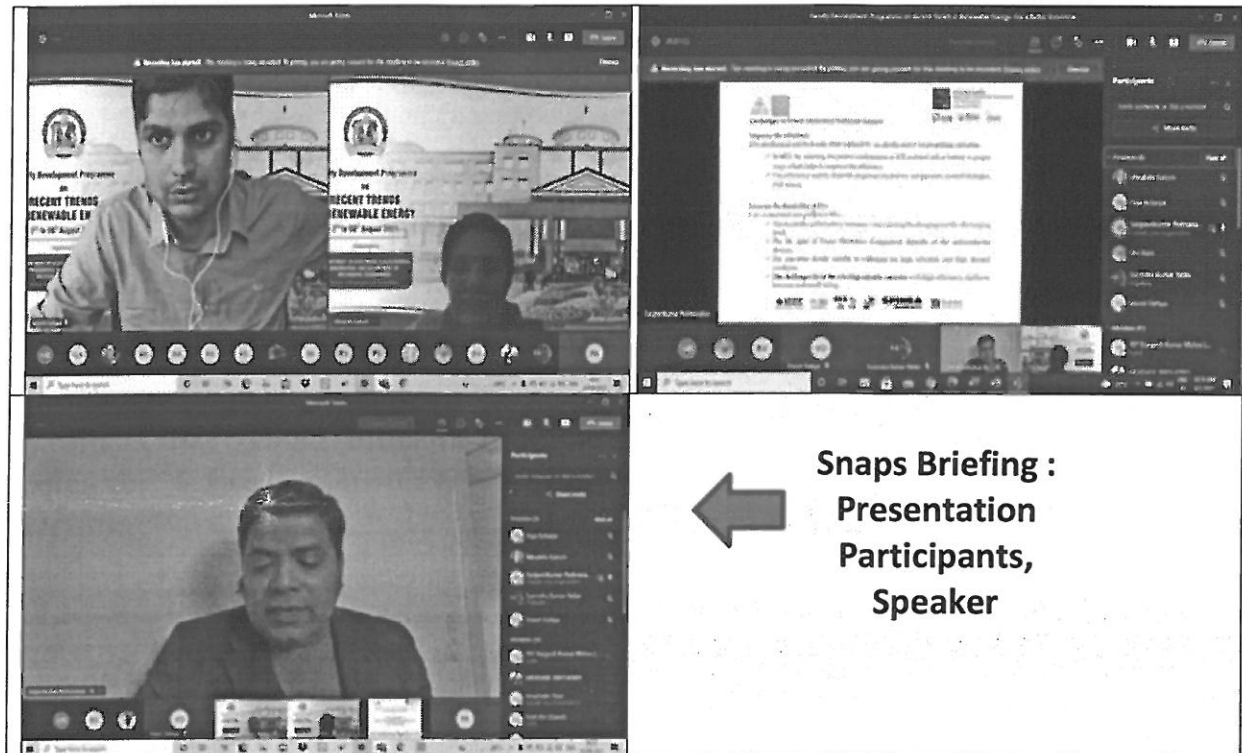
The details of FDP for Day-1 as given below:

### Day-1:

**Session-1 (09:30 AM-11:00 AM)**

**Topic: Power Electronics in Electric Vehicles**

**Speaker: Prof. Sanjeevi Kumar Padmanaban Aarhus University, Denmark**



Prof. Sanjeev deliberates his presentation over Power Electronics in Electric Vehicles. Existing market upgrades and advances upcoming are discussed. Basic working methodologies, software involved along with industrial collaboration has been briefed. Possible research scopes were briefed and also an open invitation to interested person to work over under the presented field was provided by the speaker. Session completed with student questions and talks.

### Session-2 (11:30AM-01:00 PM)

**Topic: Small Scale Wind Turbines for Sustainable Energy Generations**

**Speaker: Dr. Sukanta Roy, Curtin University, Malasiya**

Under this session basics of wind turbines are briefed initially, followed by industries participating in generation and manufacturing wind turbines are detailed. Upcoming wind projects and existing potential was also briefed. It also provides information about research work carried in the field of wind propagation over major international cities such as Denmark. Technological up gradations required are also asked by the participants at the last.



Research opportunities in the speaker's field of research also opened up towards the session attendee.

### Session-3 (02:00 PM-03:30 PM)

**Topic: EV chargers and retrofitting of EV Vehicles**

**Speaker: T. MuthuKumaran, NSIC, Hyderabad**

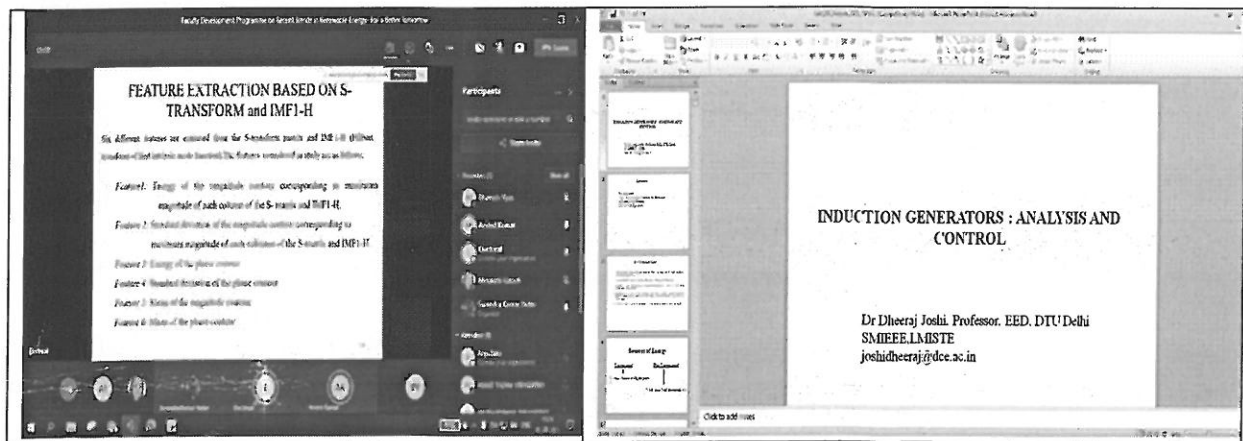
**Snaps Briefing :  
Presentation  
Participants,  
Speaker**

T. MuthuKumaran, started with basic work which deals with making and problems emerged in EV Vehicles. So basic of existing electric vehicles are explained at start after that various technologies and research related to those technologies with specific to countries, was explained. Laboratory set up along with projects carried over the labs of retrofitting the bicycles with EV kit and EV type of charging stations were explained and provided in videos. Hence providing a better view of existing day technologies may proves to be very must boosting for the young scholars attending the session.

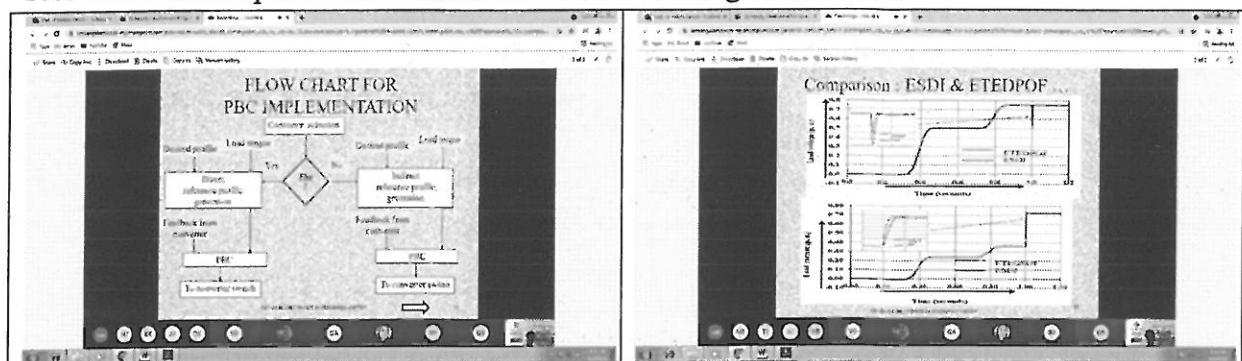


**Session-1 (09:30 AM-11:00 AM)****Topic: Induction Generator: Analysis and Control****Speaker: Dr. Dheeraj Joshi, Delhi Technological University New Delhi**

In this session conventional studies related to basics of Induction Generator and motor were concerned. The formulas guiding the equation and controls of motors are deliberated in presentation, the application of various search algorithms and nonlinear models using mat lab toolboxes were detailed and discussed. Many queries related to basics of Machine were discussed by the participants.

**Session-2 (11:30AM-01:00 PM)****Topic: Design and Control of PE Converter****Speaker: Dr. Ganesh Kumar Srinivasan, Anna University, Chennai**

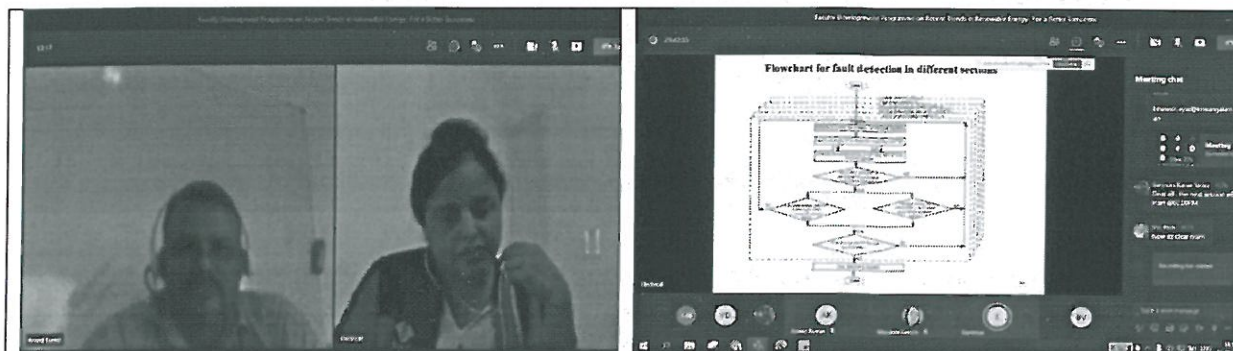
The respective session starts with the introduction of power electronics converter and their role in re designing old topology based circuits. The speaker provided multiple research objectives present as per the need of time which could be work upon for research work at present. All these basics along with simulator models design and hardware prepared were shared by the resource person. Thus providing a real time glimpse to all the attendee of the session related to power electronics converters working as real time.



**Session-3 (02:00 PM-03:30 PM)**

**Topic: Real Time Fault Detection in Offshore Wind Farm**

**Speaker: Dr. Rehana Parveen, Chandigarh University, Chandigarh**



In this session the speaker provided up gradation of work carried in the field of power electronics commanded wind farms operations. Basic strategies were discussed those are guiding the process of adding renewables to the grid. Various fault type studies, software based models; converting electrical signals to electronics etc. all are briefed with real time simulations studies provided in presentation.

**FDP DAY – 3**

**RTIRE**

**04-08-2021**

**Day-3:**

**Session-1 (09:30 AM-11:00 AM)**

**Topic: Solar Power Plant Maintenance: A Challenge in India**

**Speaker: Dr. Arpita Gupta, DCE, Greater Noida**

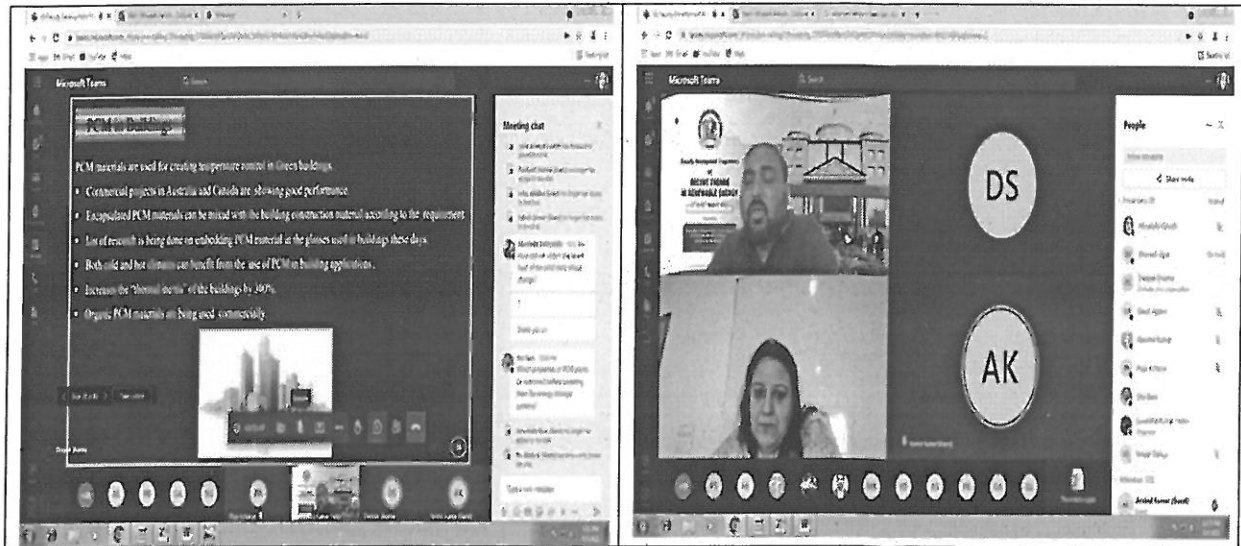


This session deals with the maintenance issues emerge during the working of solar sights. Various inspection and auditing measures required at solar generation sites were briefed. Requirements of materials at the site with respect to daily routine procedures were provided. Also industries dealing with inspection needs were elaborated with examples. Hence to occupy good set of materials and devices this session definitely capable to upgrade the industry persons connected during the session. Also the speaker was heading from industry so brief outlines from industrial point of view were shared during the time.

## Session-2 (11:30-01:00 PM)

### Topic: Importance of Phase Change Materials in Solar Thermal Applications

Speaker: Dr. Deepak Sharma, NIT Hamirpur, HP



This session conveys the recent trend of phase change materials required during real time projects work. As conventional utilization of materials need new material those could change their phase after certain modifications were briefed. The speaker talked about the thermal application of the solar plants and the impact of various phase changing materials in this field.

## Session-3 (02:00 PM-03:30 PM)

### Topic: Optimal Allocation of DG in Power Distribution Network

Speaker: Dr. Nitin Malik, Northcap University, Gurugram



In this session Optimal Allocation of DG in Power Distribution Network was conveyed. Implementation of different algorithms as per the sensitivity of a network was inspected and practiced using MATLAB software. Multiple objective based research studies were discussed with attendees of the session. To provide a holistic view of actual power system flows.



Various scopes of research in respective field as per electrical vehicle and motor considered were elaborated.

FDP DAY – 4

RTIRE

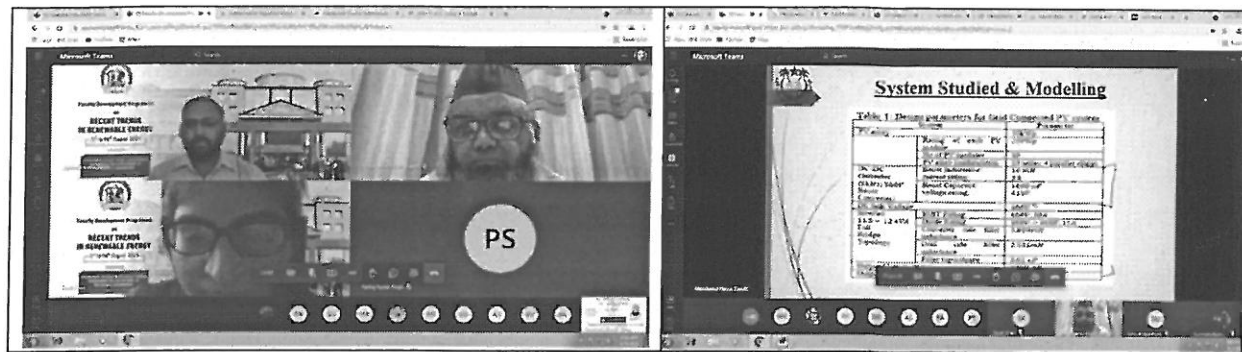
05-08-2021

#### Day-4:

**Session-1 (09:30 AM-11:00 AM)**

**Topic: Soft Computing Based Islanding detection of Grid connected Solar Inverters**

**Speaker: Dr. Ahteshamul Haque, Jamia Milia Islamia, New Delhi**



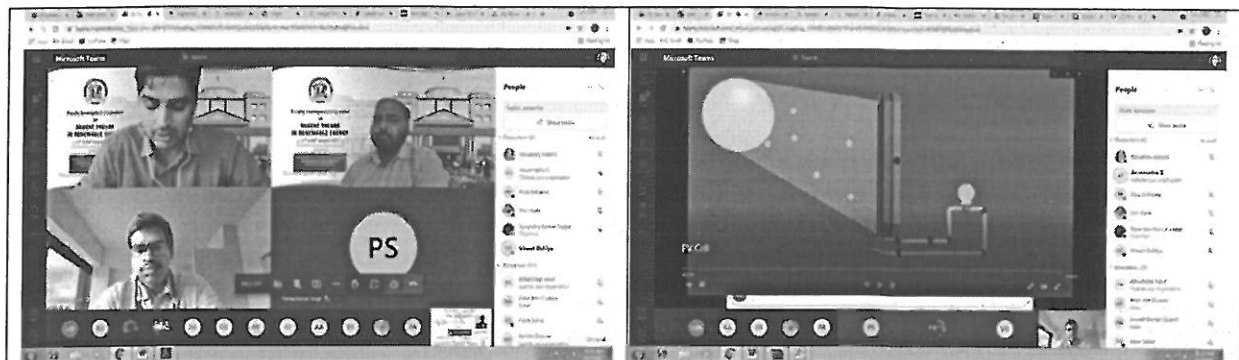
In the respective session actual demand based studies of Islanding detection of Grid connected Solar Inverters was introduced. Multiple projects set up and installation, laboratory equipment's was briefed all along the presentation. Various power converters and software deployed were discussed. Also comparison of input and output parameters considered in designing of new circuits as per research field was detailed with results.

Also participants got motivated in the direction of preparation of algorithm to inspect the islanding detection at grid level by monitoring specific parameters of power system.

**Session-2 (11:30-01:00 PM)**

**Topic: Harvesting Ambient Energy– Powering IoT**

**Speaker: Dr. S. Arunmetha, KLEF University Guntur, AP**



He had discussed the Energy harvesting (EH) systems used for Internet of Things (IoT) devices and sensors will require better EH processes for fulfilling the energy demands in the future. Many stockholders are considering prospective EH processes. The prospective EH sources and strategies which can affect the energy generation process for IoT sensor nodes,



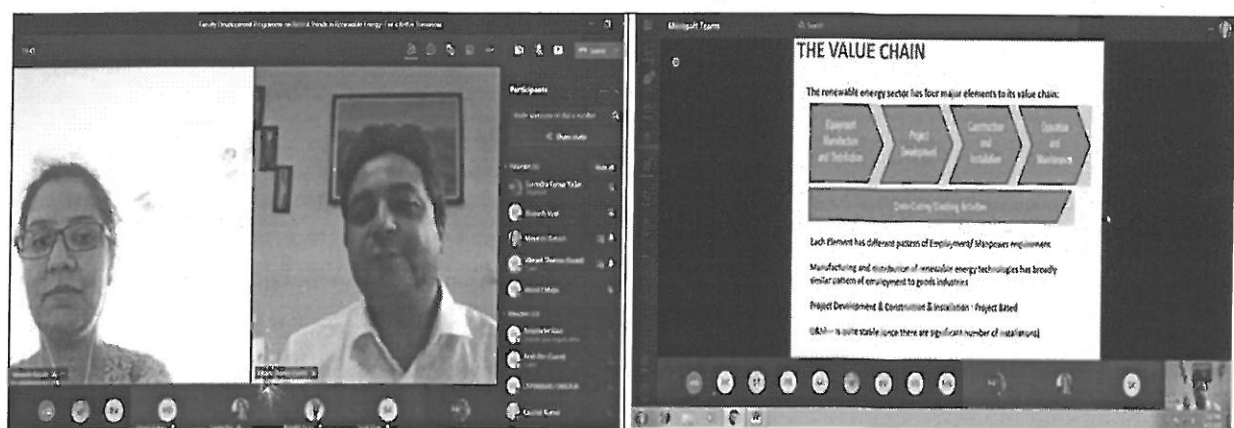
have been discussed. The energy harnessing levels, collective structure, estimation of the collected energy levels, and ability of a harvester of every class and subclass have also been investigated.

Each energy source should display distinctive harnessing abilities and researchers should determine the extraordinary potential of different energy sources. He explained that there are many ways of detailed analysis of different EH models for determining the potential energy cycles for tackling issues related to an interrupted power supply for powering IoT nodes.

### **Session-3 (02:00 PM-03:30 PM)**

**Topic: Suryamitra**

**Speaker: Dr. Vikrant Sharma, National Institute of Solar Energy Gurugram**



In this session the speaker initialized with the skill training facilities provided at their respective organization. Also upgrading of laymen's level intern persons to supervisory level were briefed out. Afterwards discussion over various government model projects and schemes favouring engineering society and workouts required were briefed. Modifications required in academic curriculum as per the practical demand is considered was outlined. Speaker also enlightens about the vast scope of jobs in operation and maintenance sector that will be going to come in upcoming market of power sector especially with reference to renewable energy is concerned.

**FDP DAY – 5**

**RTIRE**

**06-08-2021**

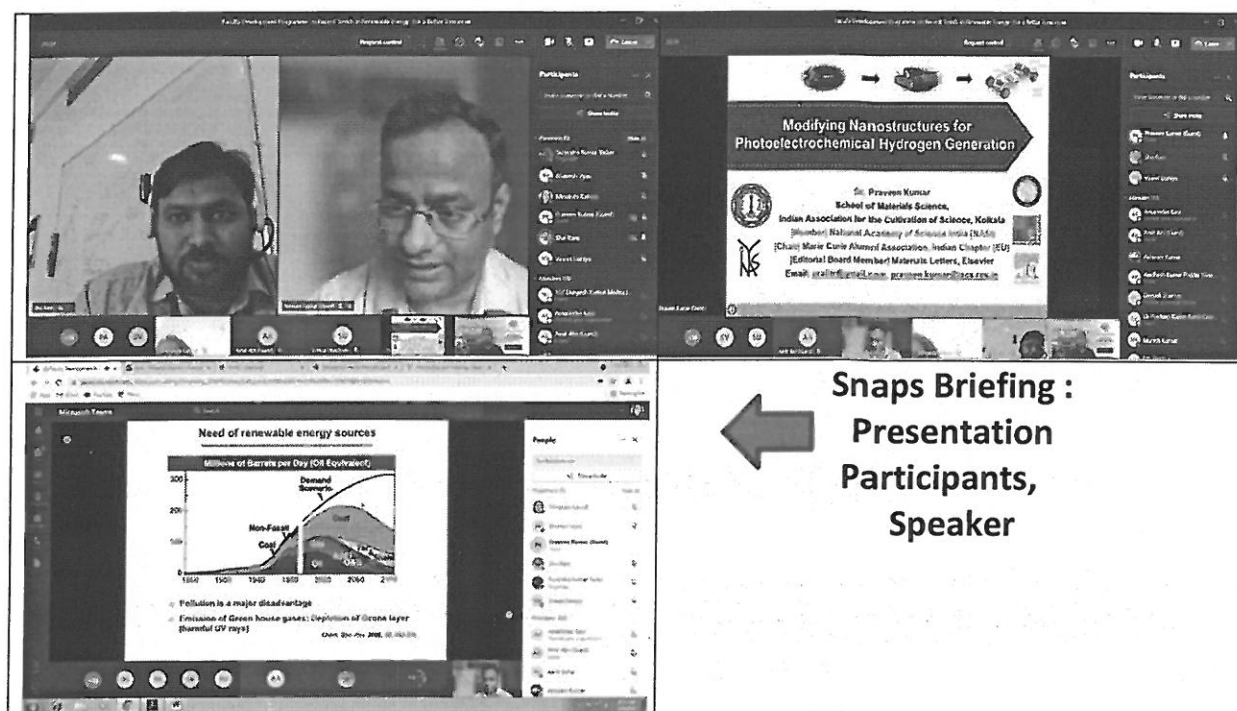
### **Session-1 (09:30 AM-11:00 AM)**

**Topic: Modified 2D Materials for Photoelectrochemical Hydrogen Generation**

**Speaker: Dr. Praveen Kumar, Indian Association for the Cultivation of Science, Kolkata**

In the respective session the speaker introduced the techniques to create hydrogen in the laboratory setup. Also importance of hydrogen with upcoming time and vehicles based on

hydrogen fuels were briefed by the experimental work and pictures provided in the presentation. He has focussed on the nanotechnology and how the change in material change can change the characteristics of the material.

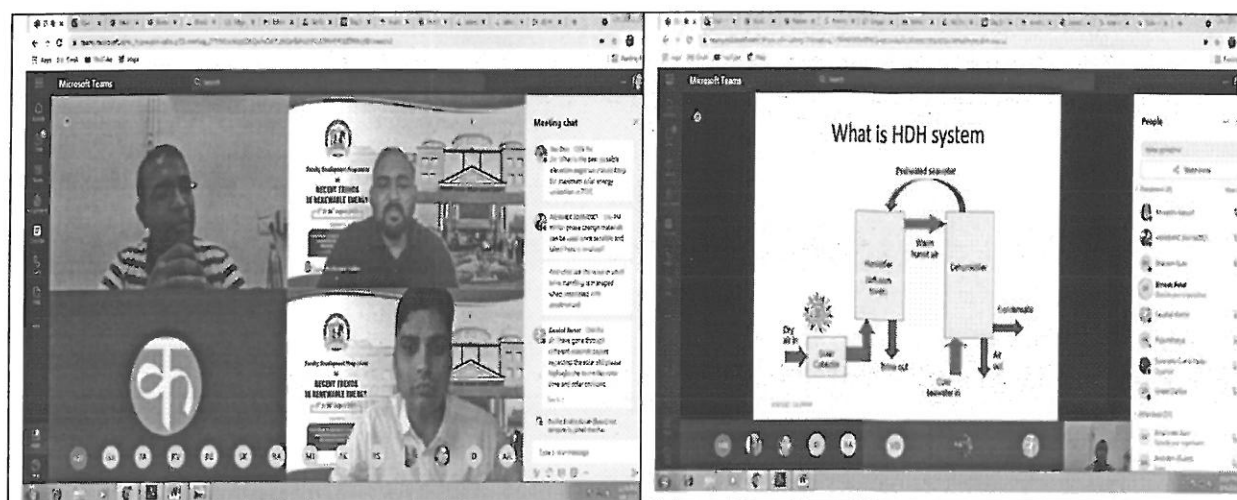


The session was full of experimental based studies and lots of future visions in field of hydrogen based studies at lower dc micro grid level were provided.

## Session-2 (11:30AM-01:00 PM)

**Topic: Research and Innovations on Solar Still**

**Speaker: Dr. Hitesh Panchal, Government Engineering College Patan, Gujarat**



He has discussed the orientation of the glass cover depends on the latitude of the place. For northern latitude south facing and southern latitude north facing stills are used. The

inclination of the cover is optimized for rate of condensation of water on the bottom surface of the cover and to collect it without the mass accumulated drops fall back into the basin. The glass cover temperature is reduced by a film of cooling water continuously flowing over the glass or intermittent flow of cooling water on the cover. The dependence of distillate output on water depth is a strong function of initial temperature of the water in the basin. The productivity of the still decreases with an increase in depth of water during daytime and the reverse is the case of overnight production. The distillate output increases with increase of the initial water temperature in the basin. Performance of still is associated with thermal conductivity of cover material. He explained that the lower thickness of condensing glass cover is preferred and inclination of glass cover is very important for increase in productivity. He also focussed on the double-basin solar still coupled with vacuum tubes which gives higher yield.

### Session-3 (01:100 PM-02:00 PM): Test- Feedback and Valediction



The 5 day long FDP concluded by discussing the reactions and withdraws from all the participants. Lastly vote of thanks put forwarded by Dean SOET Dr. Vineet Dahiya by put forwarding the key notes obtained from the complete duration of FDP.

The successful accomplishment of an event makes everyone's effort suitable. The feedback collected from the participants was very positive and motivational for the organizers. The test was conducted in this session and after that certificates were distributed. All the participants appreciated the resource person's knowledge and presentation they have deliberated. Moreover, all the resource persons were of repute in their respective fields and the knowledge imparted by them will be very useful for all of us in forthcoming academic endeavours. This Faculty Development Programme (FDP) fulfils its prime objectives to bring the faculties of different engineering, science and allied subjects onto one platform to update with the advances in the renewable energy technology and applications.