Sarvajanik Education Society
Sarvajanik College of Engineering & Technology
Sarvajanik University
Dr. R. K. Desai Marg, Opp. Mission Hospital,
Athwalines, Surat-395001

FACULTY OF ELECTRICAL ENGINEERING

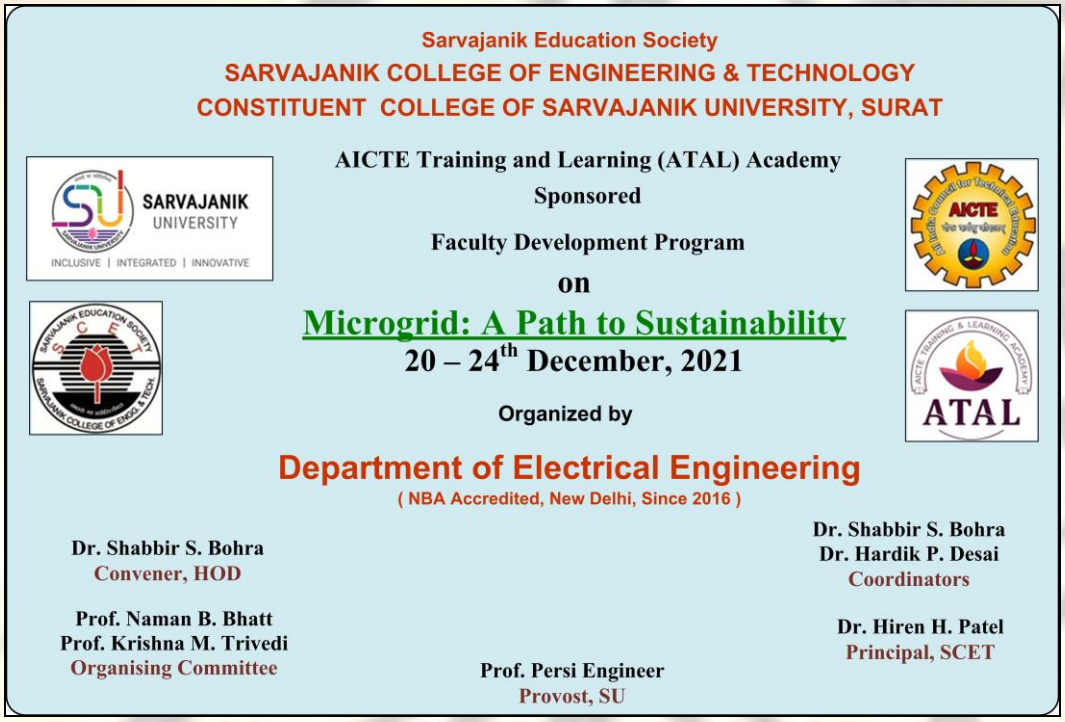
AICTE Training and Learning (ATAL) Sponsored Faculty Development Program (FDP)

On

"Microgrid: A Path to Sustainability"

20 - 24th December, 2021

Online Mode



Chief Patron
Prof. Persi Engineer
Provost, SU

Patron
Dr. Hiren H. Patel
Principal, SCET

Co-ordinators
Dr. Shabbir S. Bohra
Professor & Head, EED
Dr. Hardik P. Desai
Associate Professor, EED

Organising Committee
Prof. Naman B. Bhatt
Prof. Krishna Trivedi

Convener
Dr. Shabbir S. Bohra
Head of the Department, EED

Programme Schedule:

Microgrid: A Path to Sustainability
Schedule 20-24th December, 2021

Time	Day1	Day2	Day3	Day4	Day5
	20/12/2021	21/12/2021	22/12/2021	23/12/2021	24/12/2021
9:30 - 11:30am 11:00 - 11:30 pm	Registration and inauguration **S1** **Introduction to Microgrid and Planning (Dr. Shabbir Bohra, SCET, Surat)** Common Inauguration by AICTE ATAL	**S4** **Collaborative demand response in microgrids with virtual system operator (Dr. Chandrasekhar Yammani, NIT, Warangal)**	**S7** **Simulation Driven Approach for Power Grid Equipment (Mr. Deol P, Application Engineer, Altair)**	9:00 - 11:00am **S10** **Comprehensive Review of Various Techniques used for Hybrid AC-DC Microgrid Protection with Existing Standards (Dr. Bhaveshkumar Bhalja, IIT- Roorkee)**	**S13** **Inertia of Microgrid (Dr. Zakir H. Rather, IIT-Mumbai)** **Planning of Microgrid (Dr. Shabbir S. Bohra, Dr. Hardik P. Desai, SCET)**
11:30 - 11:45am	Break	Break	Break	11:00 - 11:15am Break	Break
11:45 - 1:45pm	**S2** **Role of Energy Storage in Microgrid (Dr. Vivek Agarwal, IIT-Bombay)**	**S5** **Power Quality Issues in Microgrid (Dr. P N Tekvani Nirma Institute of Technology, Ahmedabad)**	**S8** **AC microgrids, islanded operation of microgrid and their optimal control (Dr. Trapti Jain IIT-Indore)**	11:15 - 1:15pm **S11** **Role of Intelligent Techniques in Microgrid (Dr.Ashutosh Giri GEC, Bharuch)**	S14 **Planning of Microgrid (Dr. Nida Jafri, Green Empowerment, Malaysia)**
1:45 - 2:30pm	Lunch break	Lunch break	Lunch break	1:15 - 2:00pm Lunch break	Lunch break
2:30 - 4:30pm	**S3** **Power Electronics and Converters in Microgrid and renewable Sources (Dr. Mustafa Sahin Recep Tayyip Erdogan University, Turkey)**	**S6** **Stress Management (Prof. Vishal Doshi, GEC-Bharuch)**	**S9** **Introduction to Smart Grid Technology (Dr. Premalata Jena, IIT- Roorkee)**	**S12** (2:30 to 4:15 pm) **Modeling of Microgrid & Role of Renewable Energy Sources (Mr Ravindar Reddy, DesignTech Systems Pvt. Ltd)**	**Test** **Feedback** **Valedictory**

PROGRAM OBJECTIVE

The Sustainable Development Goals (SDG) or Global Goals are a collection of 17 interlinked global goals designed to be a "blueprint to achieve a better and more sustainable future for all". The SDGs were set up in 2015 by the United Nations (UN) General Assembly and are intended to be achieved by the year 2030.

This FDP is mainly focusing on SDG 7 (Affordable and clean energy) and 11 (Sustainable Cities and Communities). According to data published by IEA and World bank, around 800 million people are still living without access to electricity, major of portion are living in remote places where extension of utility grid is either incredibly expensive or even not feasible due topography. In order to meet the goals, planning and development of Microgrid employing Renewable Energy Sources have been encouraged by almost all countries. The key objective of this FDP is to bring awareness among budding researchers to ignite research activity in the aforesaid area. Microgrids are the main building blocks of future electrical energy system. Microgrid is defined as a group of integrated energy sources serving local loads and controlled independently. The microgrids are small, low-voltage distribution systems that interconnect renewable energy sources, distributed generators, storage devices and loads. They may be integrated into the power grids. Microgrids may be DC/AC/hybrid and can be operated in grid connected or islanded mode. The inception of microgrid is to make system more reliable, resilient and with less carbon footprint. The concept of Microgrid involves multiple aspects to be looked into, from planning to execution and control, protection and optimum energy management due involvement of fluctuating and nature of energy sources like solar photovoltaics and wind based generation.

PROGRAM CONTENT

- Introduction to Microgrid
- Planning of Microgrid
- Modelling of Microgrid
- Significance of Energy Storage System in Microgrid

- AC/DC/Hybrid Microgrids with Distributed Generation
- Grid connected and islanded operation of Microgrid
- Power Electronic Converters in Microgrid Applications
- Microgrid Operation Modes, Standards
- Electrical Inertia and Virtual Impedance of Microgrid
- Energy Management, Power Quality and Protection and Control of Microgrid

EXPECTED OUTCOME

It has been anticipated that the after successful completion of this program, participants can

- Plan and design mini/microgrid based on available energy sources
- Establish demand side management to flatten load-profile
- Attempt to bring down energy cost with reduced carbon emission
- Device protection system of grid connected and islanded operation of microgrid
- Develop algorithm for optimal power/energy management and ensuring stability of it

RESOURCE PERSONS

The sessions were handled by experts from academia, research organizations such as IITs, NITs and industries in the relevant area from within India and abroad as below:

1. Dr. Vivek Agarwal, IIT-Bombay
2. Dr. Mustafa Sahin, Recep Tayyip Erdogan University, Turkey
3. Dr. Chandrasekhar Yammani, NIT, Warangal
4. Dr. P N Tekvani, Nirma Institute of Technology, Ahmedabad
5. Prof. Vishal Doshi, GEC-Bharuch (under Stress Management and FIT India)
6. Mr. Deol P, Application Engineer, Altair
7. Dr. Trapti Jain, IIT-Indore
8. Dr. Premalata Jena, IIT- Roorkee
9. Dr. Bhaveshkumar Bhalja, IIT- Roorkee
10. Dr. Ashutosh Giri, GEC, Bharuch
11. Mr. Ravindar Reddy, DesignTech Systems Pvt. Ltd
12. Dr. Zakir H Rather, IIT-Mumbai
13. Dr. Nida Jafri, Green Empowerment, Malaysia
14. Dr. Shabbir S. Bohra, SCET, Surat

Total Number of Registration as follows:

Total number of participant registered: 107

Total number of participant appeared for the test: 78

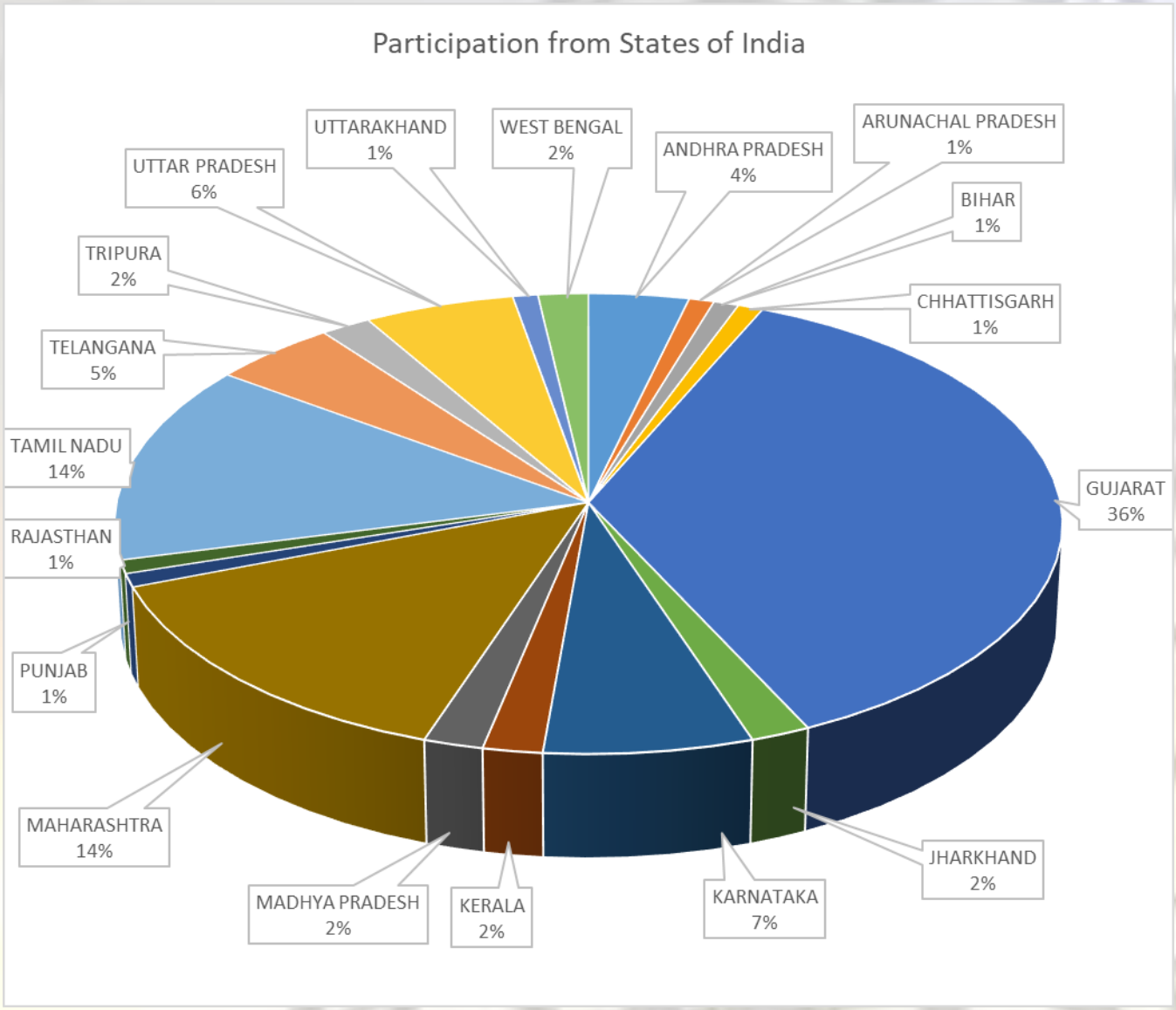
Total number of participant eligible for certificate: 78

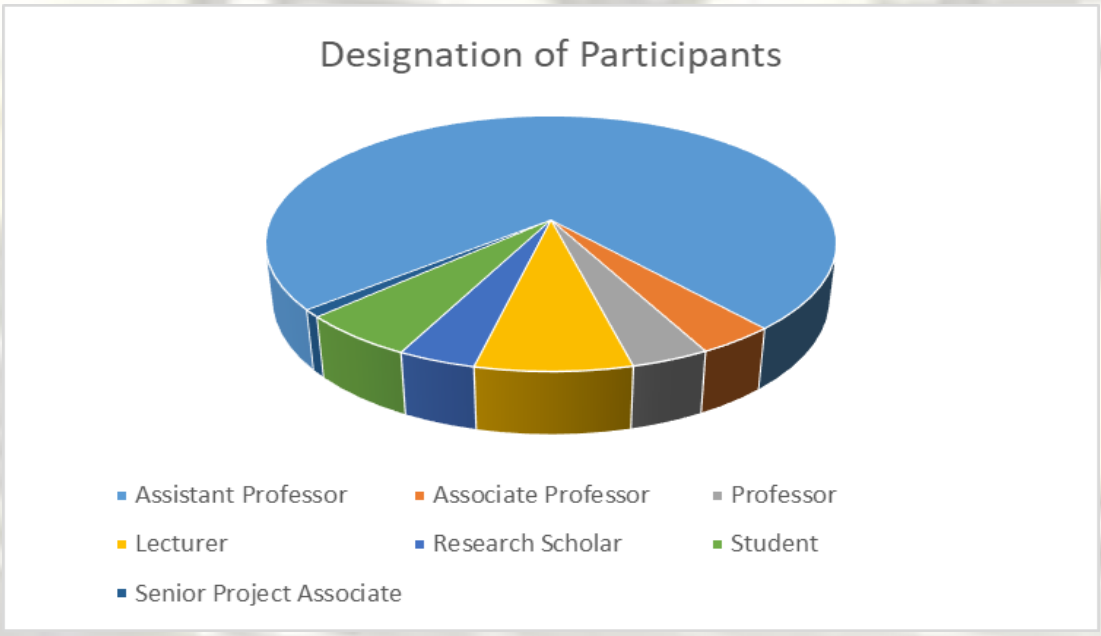
Sr. No.	Registration ID	Name	Institute Name
1	MPTS01	Mr. Rudranarayan Pradhan	Indian Institute of Technology Roorkee, Uttarkhand

2	MPTS02	Mrs. Meghna Yashwante	MMIT
3	MPTS03	Mr. Uvesh Sipai	Marwadi University
4	MPTS04	Mr. Ankur Gheewala	Shroff S. R. Rotary Institute of Chemical Technology
5	MPTS05	Mr. Mangesh R. Shelke	Priyadarshini College of Engineering
6	MPTS06	Mrs. Pritha Gupta	Bhilai Institute of Technology, Durg
7	MPTS07	Mrs. Pasupuleti Sumalatha	Sir M Visvesvaraya Institute of Technology
8	MPTS08	Dr. Dr. Champa Nandi	Tripura University
9	MPTS09	Dr. R Gowrisankara Rao	MVGR college of Engineering(Autonomous)
10	MPTS10	Mr. James Antony Pinto	Manipal Institute of Technology, Manipal
11	MPTS11	Mr. Roshan Chitranshi	United College of Engineering and Management, Allahabad
12	MPTS12	Mr. Jegadeesh Kumar R	Karpagam College of Engineering
13	MPTS13	Mrs. Asra Sultana	ISL Engineering College
14	MPTS14	Mr. syed yasser ali	Indian institute of science
15	MPTS15	Mr. Jigar j jain	Dr. Jivraj Mehta Institute of Technology
16	MPTS16	Miss Niti Desai	GEC, Godhra
17	MPTS17	Dr.N.Senthil Kumar	Vellore Institute of Technology
18	MPTS18	Mr. Devender jarupula	NIT KKR
19	MPTS19	Miss Parmar Vibha	charusat university
20	MPTS20	Mrs. Dr Rahul Somalwar	BAJAJ Institute of Technology
21	MPTS21	Mr. Minesh K Joshi	ADIT
22	MPTS22	Mr. Kannan Selvam	Laxmi Institute of Technology, Sarigam
23	MPTS23	Mr. Praful P Chudasama	Shroff S R Rotary Institute of Chemical Technology
24	MPTS24	Mr. Jigneshkumar P. Desai	Ganpat University- U.V.Patel College of Engineering
25	MPTS25	Mr. Bhavesh Ramkikbhai Hindocha	G H Patel College Of Engineering & Technology
26	MPTS26	Miss Swathi Krishna	NIT Calicut
27	MPTS27	Mrs. Morampudi Rajitha	CVR College Of Engineerig
28	MPTS28	Mr. Raval Hemantkumar Natvarlal	Gujarat Technological University
29	MPTS29	Mr. Patel Nikunjkumar Nareshbhai	U.V.Patel College Of Engineering
30	MPTS30	Mr. Satyam Kumar Upadhyay	UNS Institute of Engineering and technology, VBS Purvanchal University, jaunpur
31	MPTS31	Dr. Kaumil B Shah	Nirma Institute of Technology
32	MPTS32	Dr. Arvind Kumar	Bansal Institute of Engineering and Technology, Lucknow, U.P.
33	MPTS33	Mr. Kalpesh Soni	Dr. Jivraj Mehta Institute of Technology
34	MPTS34	Miss Nikita Madhukar Malwar	Tulsiramji Gaikwad Patil College of Engg & Tech
35	MPTS35	Mr. Hardik Pandya	Sarvajanik College of Engineering & Technology
36	MPTS36	Mr. Dinto Mathew	Mar Athanasius College of Engineering Kothamangalam
37	MPTS37	Mrs. Hetal H. Jivanramjiwala	C.K.Pithawala College of Engineering and Technology
38	MPTS38	Mr. Kapilkumar Kantilal Patel	C K Pithawala College Of Engineering And Technology

39	MPTS39	Mr. Shiv Prakash Singh	Baddiuzamakhan Institute of Polytechnic Pupri Sitamarhi
40	MPTS40	Dr. Smita Shandilya	Sagar Institute of Research and Technology
41	MPTS41	Miss Hetal Champaklal Ejner	Government Engineering College, Bharuch
42	MPTS42	Mrs. Jyotiben H.Patel	Government Polytechnic,Waghai
43	MPTS43	Miss Ranjitaben Ramanbhai Gavli	Dr.J.N.Mehta government polytechnic Amreli
44	MPTS44	Mr. Bharat S Sudame	Yeshwantrao Chavan College of Engineering, Nagpur
45	MPTS45	Miss Mittal Muljibhai Parmar	Government Engineering College, Dahod
46	MPTS46	Mr. Bheda Niravkumar Babubhai	L D College Ahemdabad
47	MPTS47	Mrs. Monesha S	College of Engineering, Guindy Campus, Anna University, Chennai
48	MPTS48	Mr. Saurabh Madhaorao Ingale	Amrutvahini College of Engineering Sangamner
49	MPTS49	Mrs. Abinaya	Sri Ramakrishna Engineering College
50	MPTS50	Mr. Devang Kirtibhai Mer	Gyanmanjari Institute of Technology
51	MPTS51	Mr. Veeranjaneyulu Gopu	R.V.R & J.C College of Engineering
52	MPTS52	Mr. Keyur Kinariwala	Ganpat University
53	MPTS53	Mr. S Vijayakumar	Gnanamani College of Technology
54	MPTS54	Mr. Pullamma Gari Pedda Reddy	St.Johns college of engineering and technology
55	MPTS55	Mr. Soumesh Chatterjee	Institute of Technology, Nirma University
56	MPTS56	Mr. Joshua Daniel S	Hindusthan College of Engineering and Technology
57	MPTS57	Dr. N.Murali Krishnan	Mailam Engineering college
58	MPTS58	Mr. Swaraj Satish Kadam	Dr. D Y Patil Institute of Technology, Pimpri, Pune 18
59	MPTS59	Mr. Ankur Vasantlal Rana	C G Patel Institute Of Technology
60	MPTS60	Mrs. Darshni M.Shukla	Dr.S & S Government Engineering College Surat
61	MPTS61	Dr. N Shanmuga priya	Siddaganga institute of Technology
62	MPTS62	Miss Nidhi Yashvantrai Savjani	GP Rajkot
63	MPTS63	Mr. Abhishek Bamania	L. D. College Of Engineering
64	MPTS64	Mr. Akhilesh Sharma	North Eastern Regional Institute of Science and technology
65	MPTS65	Miss Sharayu Wasu	WCEM Nagpur
66	MPTS66	Dr. Rakeshkumar Ambalal Patel	Ganpat University U. V. Patel College of Engineering
67	MPTS67	Mr. Vaibhav Ajit Sansare	Finolex Academy of Management and Technology, Ratnagiri
68	MPTS68	Dr. S V Anbuselvi	Anna University
69	MPTS69	Mr. Malu Hanmanth	shreeyash college of engineering
70	MPTS70	Mr. Bobbili Gangadhara Rao	JNTUK
71	MPTS71	Mr. Raghavendra L	ATME College of Engineering, Mysuru, Karnataka
72	MPTS72	Mrs. Sweta Bijali Maity	Haldia Institute of Technology

73	MPTS73	Mrs. Shashirekha k	Yit Moodbidri
74	MPTS74	Mr. Abhijit Saha	Tripura University
75	MPTS75	Mr. Alex M	A.V.C.College Of Engineering
76	MPTS76	Mr. Rakesh Choudhary	Oriental University Indore
77	MPTS77	Mr. Raj Kumar Maity	Haldia Institute Of Technology
78	MPTS78	Mrs. Ramya K R	K S Institute of Technology
79	MPTS79	Mr. Patel Mayank Chandrakantbhai	Sarvajanik College of Engineering & Technology, Surat
80	MPTS80	Miss Kajal Ramesh Solanki	Sarvajanik College Of Engineering & Technology, Surat
81	MPTS81	Mr. Pawan Kumar Yogi	Arya College Of Engineering & Information Technology
82	MPTS82	Mr. Shashikant Prasad	Dr. D. Y. Patil Institute of Technology, Pimpri, Pune
83	MPTS83	Mr. Pankaj Kumar	Dr. D.Y.patil Institute of technology, Pimpri Pune
84	MPTS84	Miss Rajashree Ramkrishna Bhokare	Dr. D.Y.Patil Institute of Technology Pimpri Pune
85	MPTS85	Mrs. Jaya Bharathi G	Anjala Ammal mahalingam Engineering College
86	MPTS86	Miss Shweta Shashikant Ghadyalji	Yeshwantrao Chavan College Of Engineering
87	MPTS87	Mrs. Mrunalini Padmanabh Wakhare	Yeshwantrao Chavan College of Engineering
88	MPTS88	Mr. Bhavesh Shankarbhai Patel	Gidc Degree Engineering College,Abrama,Navsari
89	MPTS89	Mr. Patel Kundankumar Mukeshbhai	Asian Institute Of Technology
90	MPTS90	Mr. Paramasivam P	P A C Ramasamy Raja Polytechnic College, Rajapalayam
91	MPTS91	Miss Surabhi L. Kachhawa	Yeshwantrao Chavan College of Engineering
92	MPTS92	Mr. Ketankumar Rameshbhai Patel	Vidhyadeep Institute Of Enineering And Technology Diploma
93	MPTS93	Mr. Dipendrasinh Chandrasinh Parmar	Government Engineering College, Valsad
94	MPTS94	Mrs. Divya S	Coimbatore Institute of Technology
95	MPTS95	Dr. Mayank Srivastava	Amity University
96	MPTS96	Mr. Dhananjay Kumar	Rajarshi rananjay sinh institute of management and technology Amethi Uttar Pradesh
97	MPTS97	Mr. Hariom Satapathy	Eshan Group Of Institution
98	MPTS98	Dr. Kalpesh Patil	SCET, Surat
99	MPTS99	Mrs. Amritjot Kaur	chandigarh university
100	MPTS100	Mr. Hemin Dhananjay Motiwala	Sarvajanik College of Engineering & Technology, Surat
101	MPTS101	Mrs. S. Nirmala	Mahendra Engineering College For Women
102	MPTS102	Miss Kunjal Solanki	C u Shah polytechnic surendranagar
103	MPTS103	Mrs. Vimala	CVR College Of Engineering
104	MPTS104	Mrs. R.Amutha	Ultra college of Engineering and Technology
105	MPTS105	Miss Warisha Meraj	HRIT
106	MPTS106	Mrs. Manjula Dhandapani	Sri Ramakrishna Engineering College
107	MPTS107	Miss Sushma H R	BMS Evening College Of Engineering

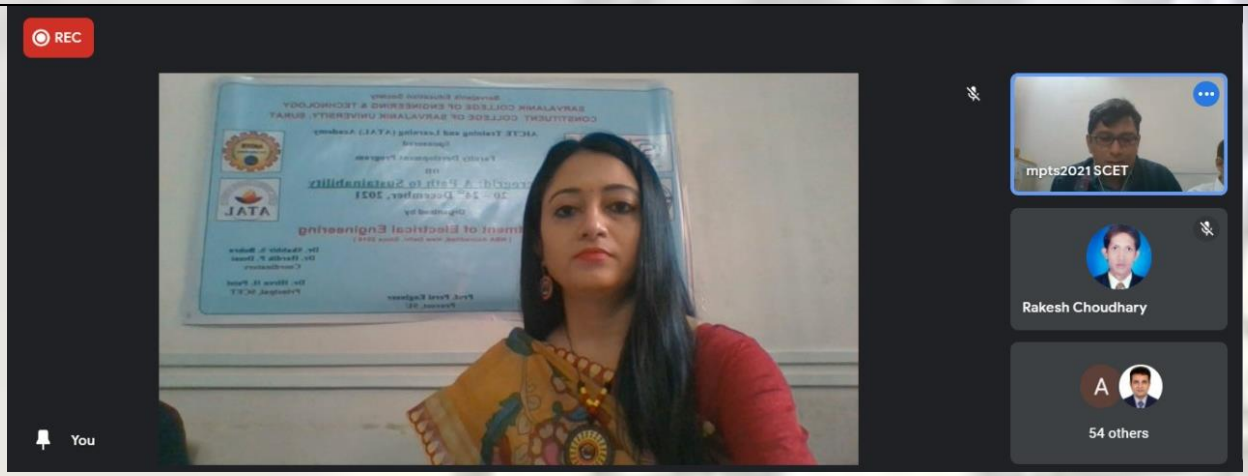

Participation from States of India
UTTARAKHAND 1%
WEST BENGAL 2%
ANDHRA PRADESH 4%
ARUNACHAL PRADESH 1%
UTTAR PRADESH 6%
BIHAR 1%
TRIPURA 2%
CHHATTISGARH 1%
TELANGANA 5%
TAMIL NADU 14%
GUJARAT 36%
RAJASTHAN 1%
PUNJAB 1%
MAHARASHTRA 14%
JHARKHAND 2%
MADHYA PRADESH 2%
KERALA 2%
KARNATAKA 7%

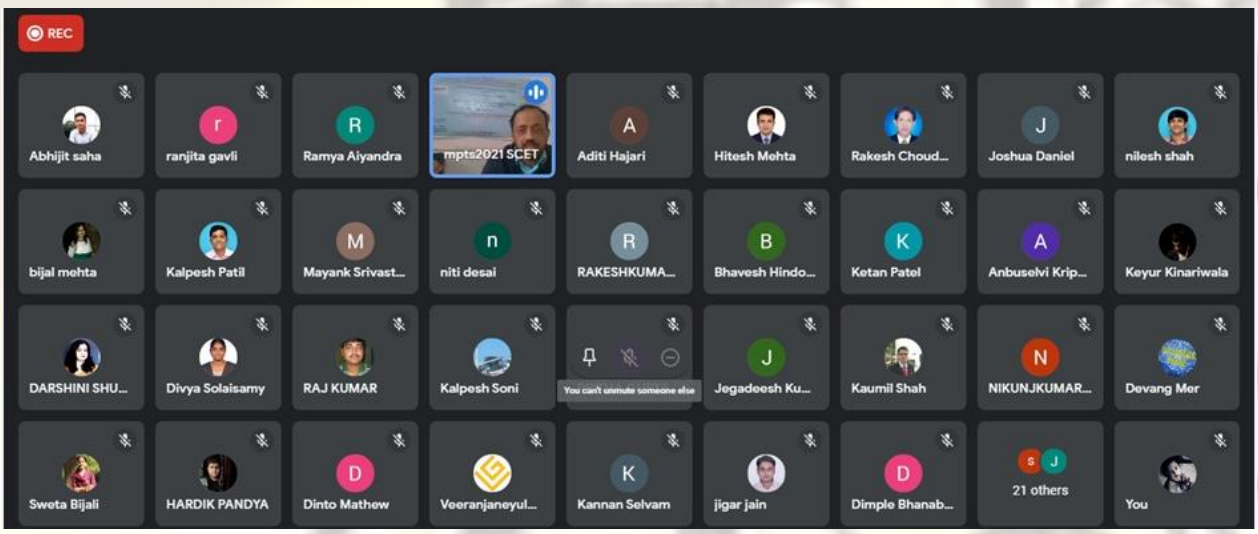

Designation of Participants
Assistant Professor
Associate Professor
Professor
Lecturer
Research Scholar
Student
Senior Project Associate

Glimpses of the Events:

Team of ATAL FDP on "Microgrid: A Path to Sustainability"

Department of Electrical Engineering





Inauguration on 20th December, 2021

An inauguration ceremony of AICTE ATAL Faculty Development program (FDP) began at 9:30am on 20th December, 2021 after offering prayer to Almighy God by Coordinators, Dr. Shabbir S. Bohra, Dr. Hardik P. Desai, Prof. Naman Bhatt and Prof. Krishna Trivedi. Dr. Shabbir S. Bohra briefed about the objective and outcome of this FDP and highlighted about various topics to be covered and resource persons. Dr. Hardik Desai Presented a Vote of Thanks.

All India Council for Technical Education, New Delhi

Inauguration of 25 ATAL online FDP

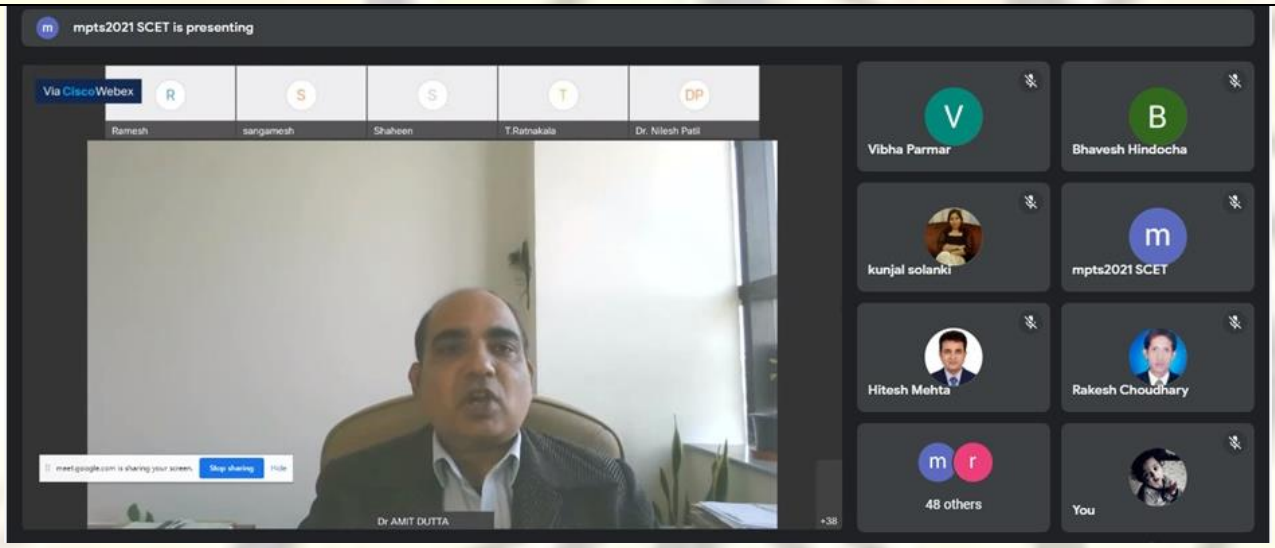
Monday, 20th December, 2021 at 11:00 am

Minute to Minute Program

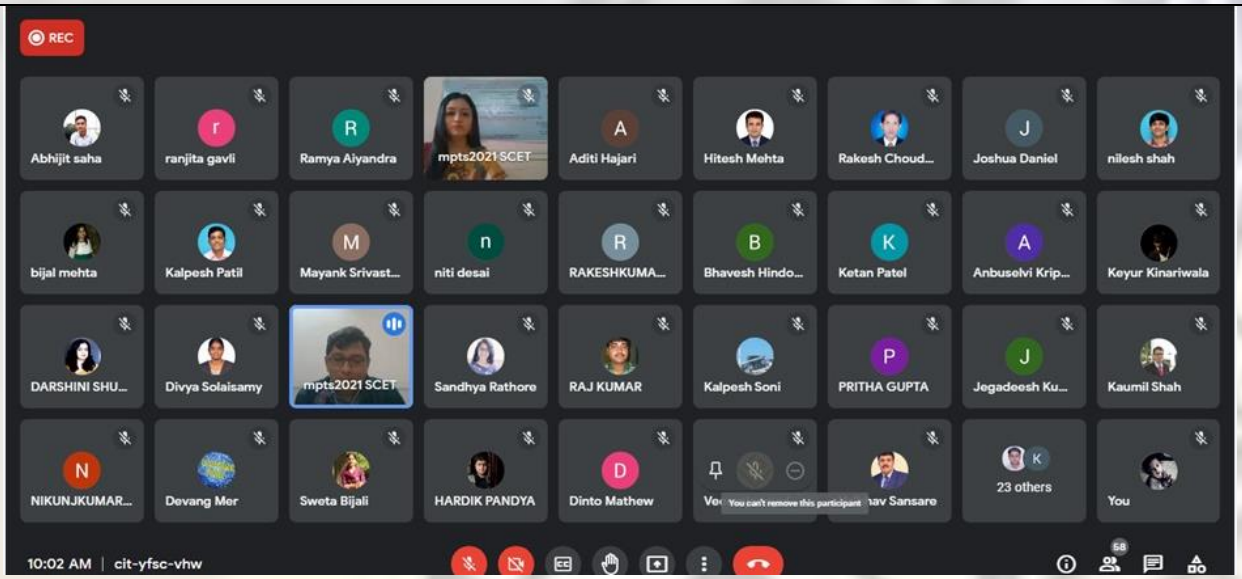
11:00 am	**Virtual Arrival of Honorable Chief Guest and Dignitaries.**
11:03 am	**Virtual lamp lighting and Saraswati Vandana.**
11:04 am	**Welcome Address by Dr.Amit Dutta Deputy Director, ATAL Academy, AICTE.**
11:12 am	**Address Dr. M.P. Poonia, Vice Chairman, AICTE**
11:20 am	**Address by Sandy Carter, Vice President Amazon Web Services.**
11:30 am	**Vote of thanks by Sh. M. Sundaresan Regional Officer & Deputy Director, SRO, AICTE**

Inaugural Program Closes

A Common On-line Inauguration was scheduled by AICTE ATAL team, New Delhi for all 25 FDPs commening from 20th December, 2021 during 11:00am to 11:45am



Inauguration: Dr. Amit Datta

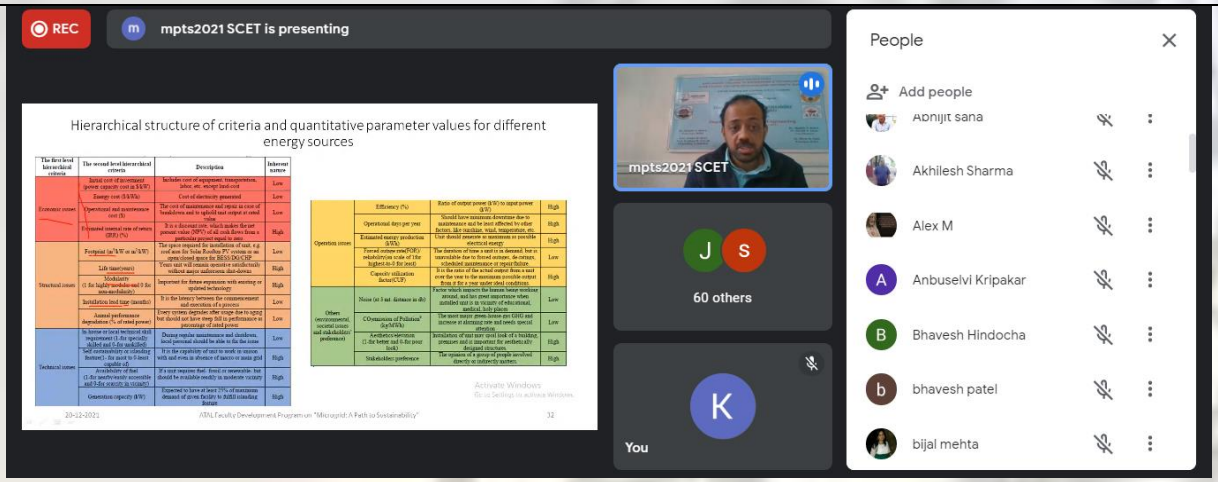


Inauguration: Dr. Shabbir Bohra

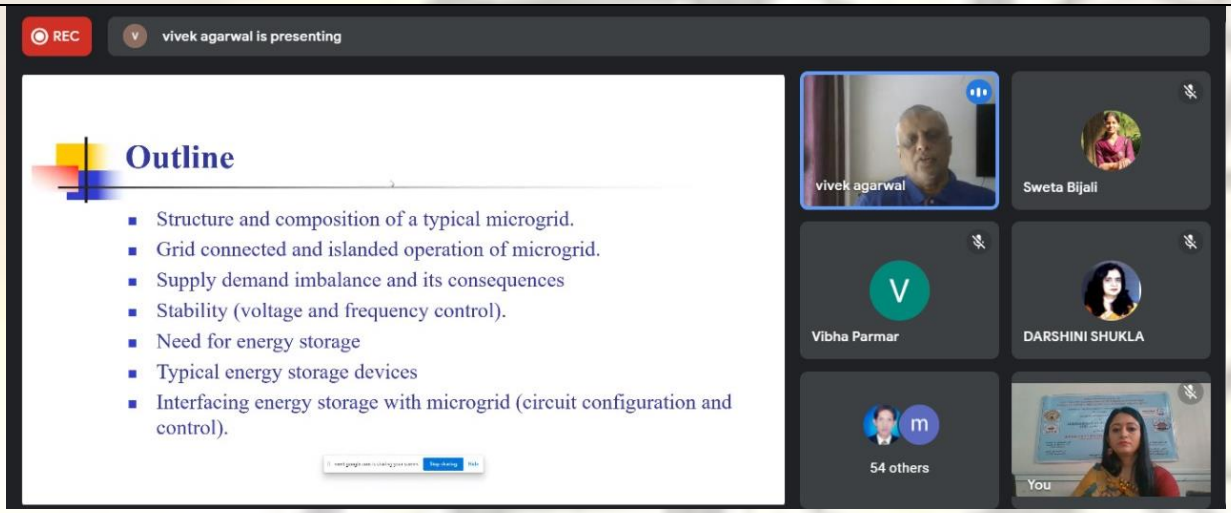
Session S1: 10:00am to 11:00am by Dr. Shabbir S. Bohra

Session S1: Dr. Shabbir S. Bohra on Introduction to Microgrid and Planning

An introduction and definition of Microgrid was discussed. Furthermore, various aspects of SDGs established by UN has been focused alongwith merits and demerits/challenges were streched upon.Various applications and types of microgrids were explained with some case studies of India and abroad. Thenafter, the key factors in planning of any microgrid incorporating conventional and renewable energy sources were discussed using multi-criteria-decision-making (MCDM) and fuzzy Analytic-Hierarchy-Process (AHP) technique.



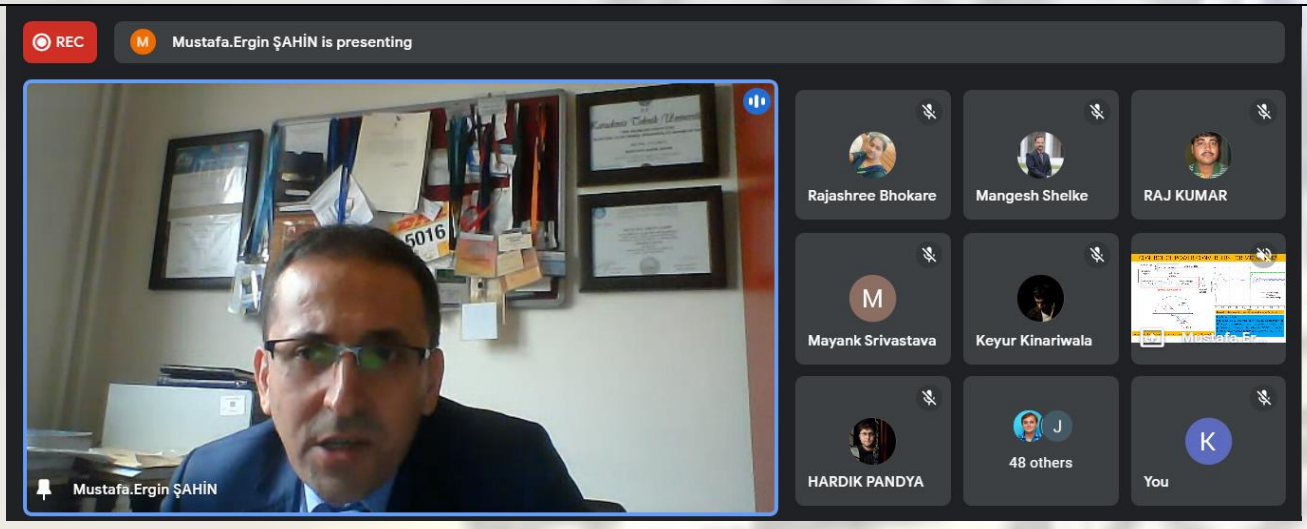
Speaker: Dr. Shabbir Bohra, SCET, Surat



Speaker: Dr. Vivek Agarwal, IIT Bombay

Session S2: Dr. Vivek Agarwal on Role of Energy Storage in Microgrid

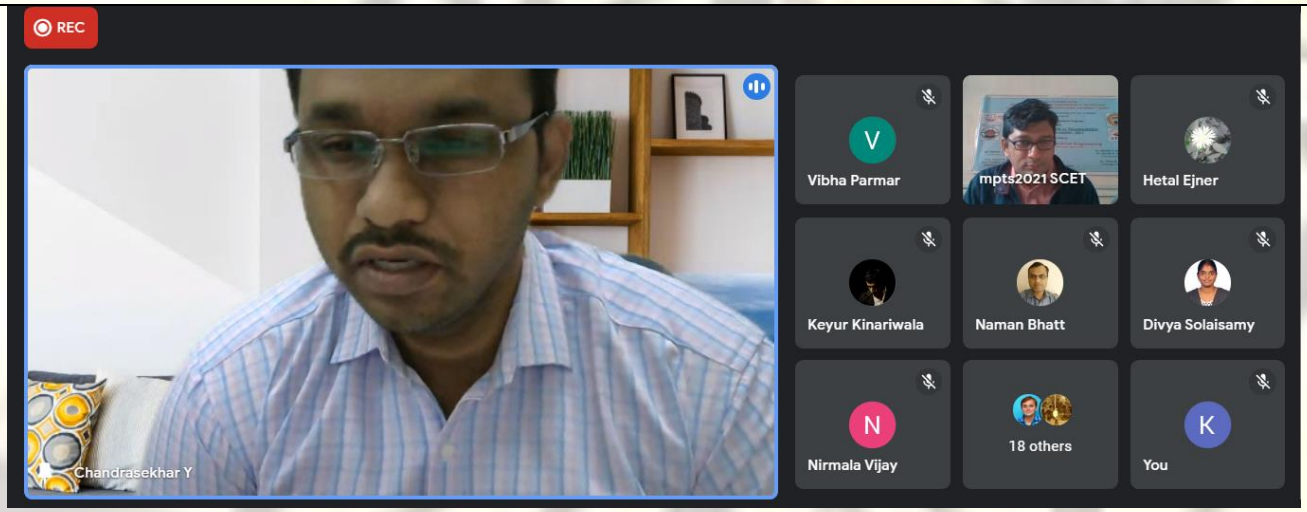
Dr. Vivek Agarwal had started with basic introduction of Microgrid and then explained the need for energy storage devices in such environment. He explained so well about intermittent nature of non-conventional energy sources, mainly solar photovoltaics (PV) and wind turbines. He also gave some idea about battery storage system and ultra capacitors, comparison in terms of their power and energy density. The construction of super capacitor was also illustrated.



Speaker : Dr. Mustafa Sahin, Recep Tayyip Erdogan University, Turkey

Session S3: Dr. Mustafa Sahin on Power Electronics and Converters in Microgrid and renewable Sources

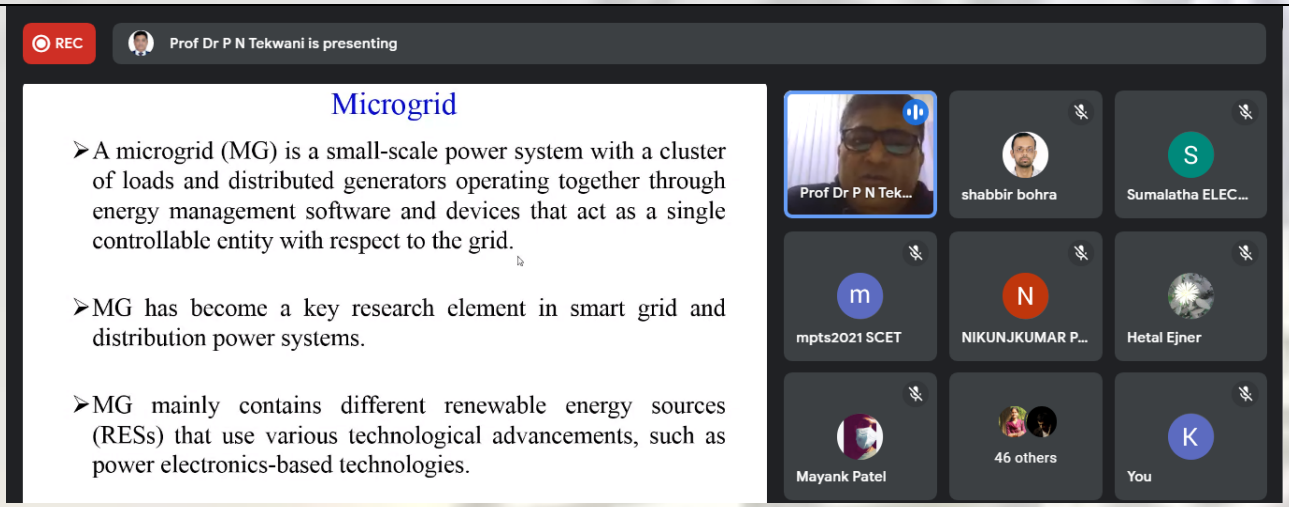
Dr. Mustafa emphasised on salient aspects and requirement of power electronics converters in microgrid and renewable sources. He discussed few converters and their working typically suitable for such applications. Also, he had elaborated on applications using hydrogen fuel cells targeting microgrid and electric vehicle applications. He has also explained various control techniques used in converters applications like PI (Proportional-Integral), FLC (Fuzzy-Logic-Control) and SMC (Sliding-Mode-Control).



Speaker : Dr. Chandrasekhar Yammani, NIT, Warangal

Session S4: Dr. Chandrasekhar Yammani on Collaborative demand response in microgrids with virtual system operator

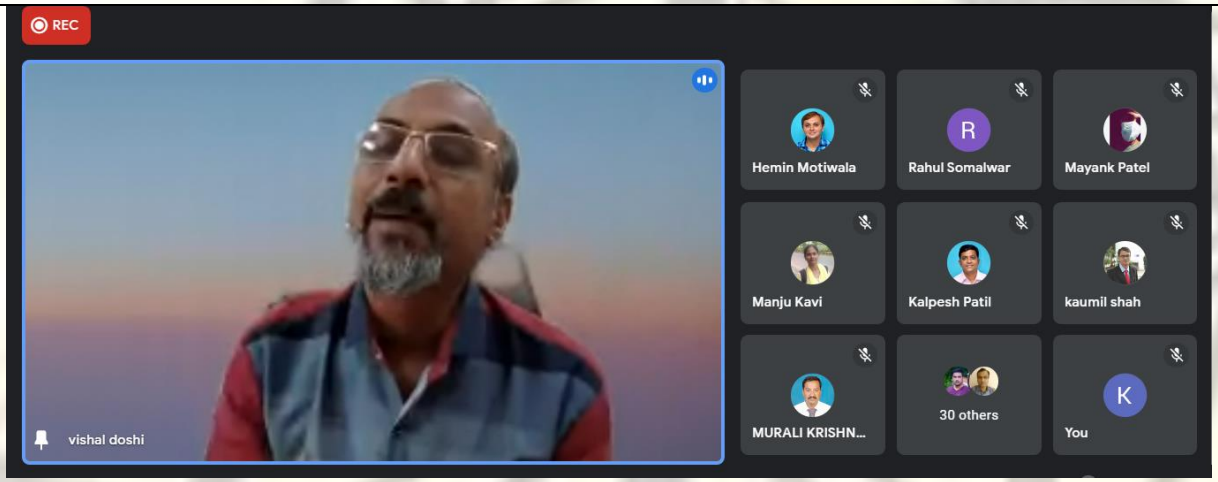
Dr. Chandrasekhar had discussed collaborative demand response in microgrids with virtual system operator (VSO). He illustrated the schematic and role of VSO.he explained the role in context of industrial consumer, for EV charging system and aggregated residential loads. He well illustrated the monetary benefits with and without demand response (DR).



Speaker : Dr. P N Tekvani, Nirma Institute of Technology, Ahmedabad

Session S5: Dr. P N Tekvani on Power Quality Issues in Microgrid

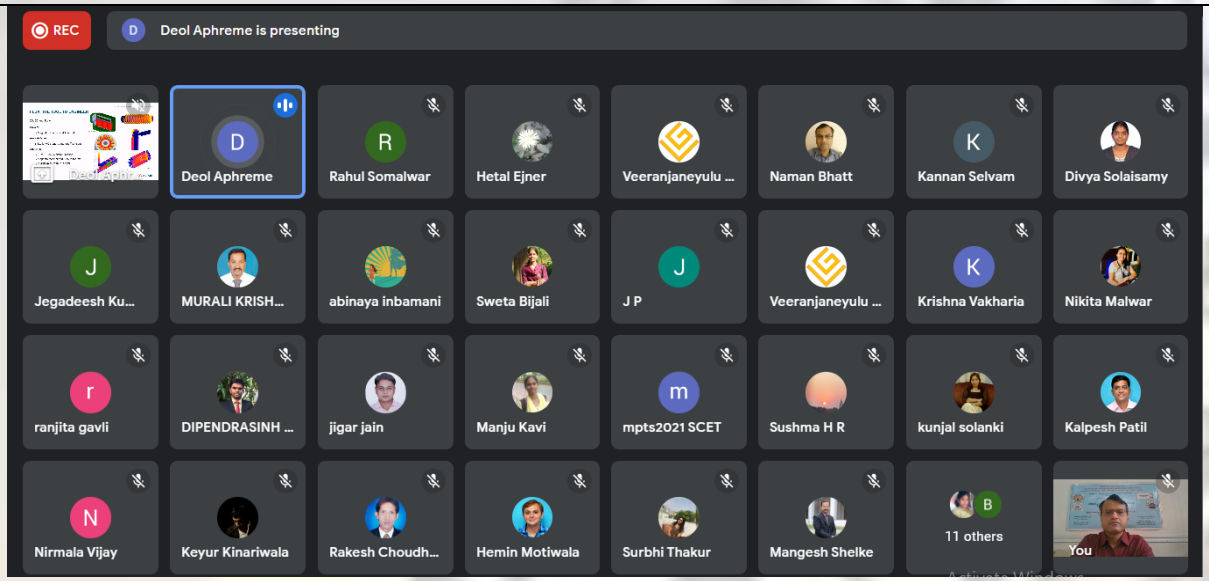
Dr. Tekwani briefed about the total generating capacity and shares of renewables today. He has explained national wind-solar hybrid policy. He explained basic configuration of a grid connected MW sized wind turbines. He explained the why microgrid should be promoted for sustainability and discussed various types of grid connected inverters, such as grid forming, grid following grid supporting and interlinking converters. The he discussed various power quality issues during grid connected and islanded operation of microgrid. He also briefed little about active voltage conditioner, dynamic voltage restorer and compensators, etc.



Speaker : Stress Management by Prof. Vishal Doshi, GEC-Bharuch

Session S6: Prof. Vishal Doshi on Stress Management

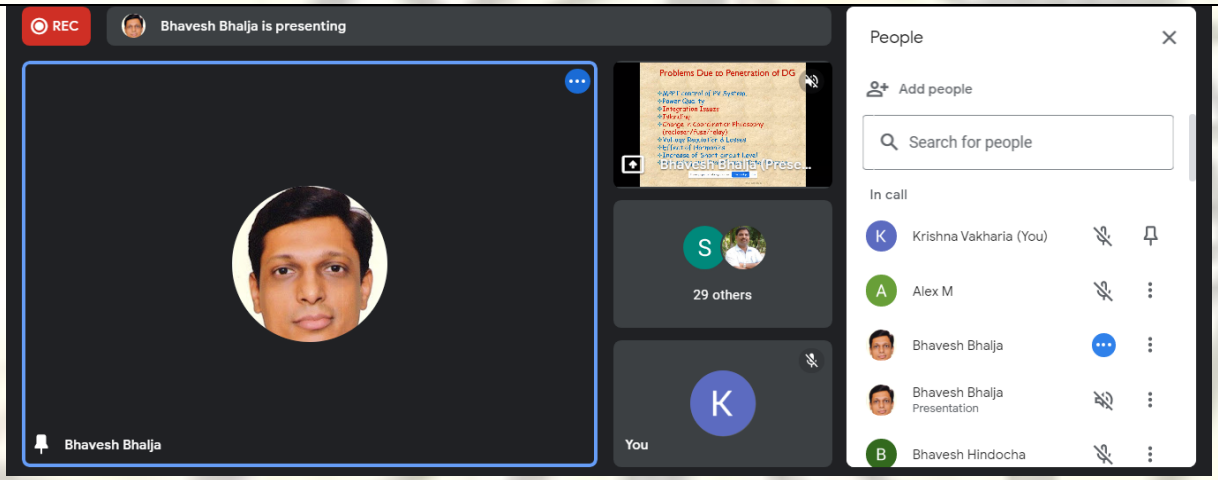
Prof. Vishal was invited to made participants aware about mental and physical health. He emphasised a lot on stress management and more on stress elimination. He also explained various aspects of human being which causes depression, anxiety and other health related problems. He also exemplified the influence of other people, surrounding on our behaviour, attitude and desires to achieve something.



Speaker : Mr. Deol P, ApplicationEngineer, Altair

Session S7: Mr. Deol P, Application Engineer, Altair on Simulation Driven Approach for Power Grid Equipment

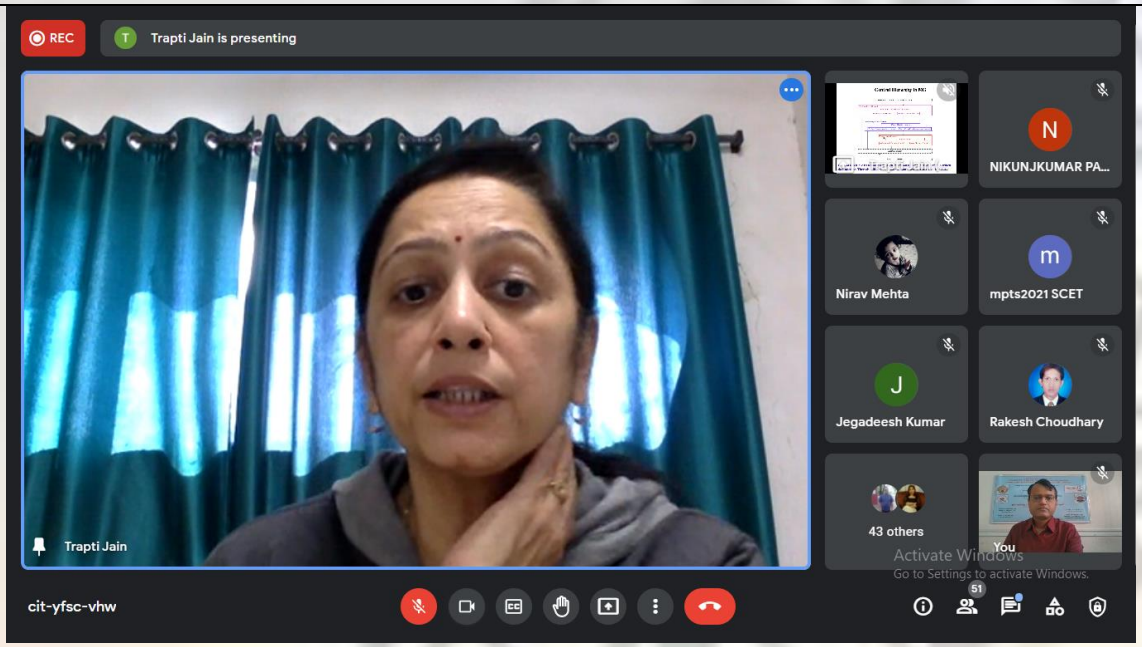
Mr. Deol gave idea about the salient and powerful features of FLUX software for the development and analysis of any electrical components, such as cables, breakers, transformers, generators, etc. He also demonstrated the accuracy offered by FLUX after simulating and developed prototype. He explained the reasons for rising demands for power grid equipments.



Speaker : Dr. Bhaveshkumar Bhalja,IIT- Roorkee

Session S10: Dr. Bhaveshkumar Bhalja on Comprehensive Review of Various Techniques used for Hybrid AC-DC Microgrid Protection with Existing Standards

Dr. Bhalja had discussed various protection techniques used in hybrid AC-DC microgrid systems. He discussed about various IEEE and IEC standards to be referred for designing protection system for distributed resources connected with power system. He also introduced participants to the role and significance of Phasor Measurement Units (PMU) in existing power system and Smart Grids.



Speaker : Dr. Trapti JainIIT-Indore

Session S8: Dr. Trapti Jain on AC microgrids, islanded operation of microgrid and their optimal control

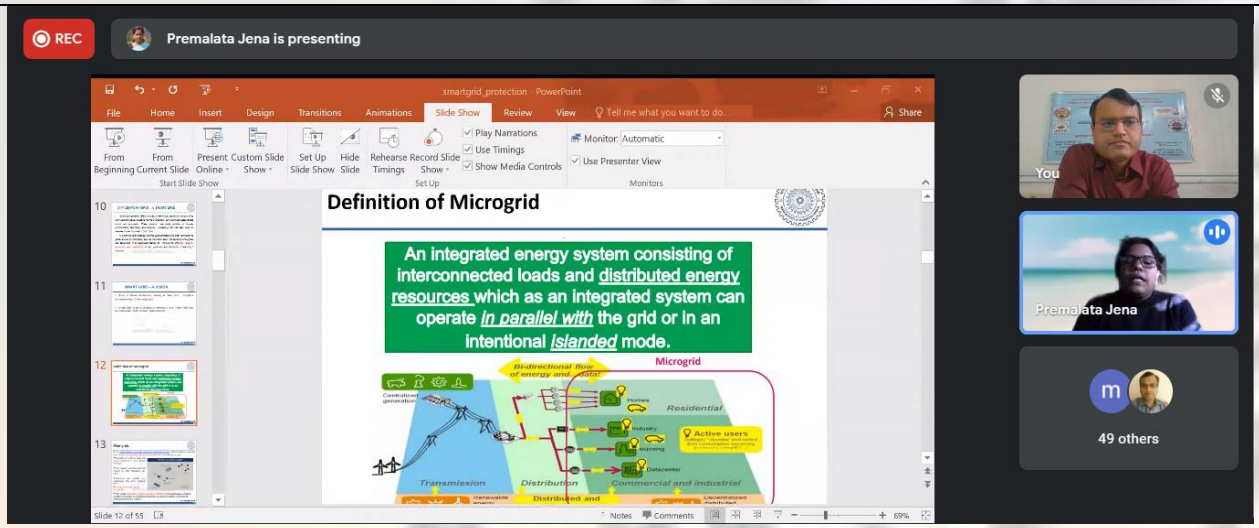
Dr Trapti Jain mainly focused on controls involved in especially AC microgrids. She explained objectives and various control techniques for effective energy management of energy sources of microgrid. She elaborated primary, secondary and tertiary control. The issue of stability and its causes and remedies were also discussed. Centralised controller algorithm, design and simulations results were also explained in a very elaborative manner.

Speaker: Mr Ravindar Reddy, DesignTech Systems Pvt.Ltd

Session S12: Mr Ravindar Reddy, DesignTech Systems Pvt. Ltd on **Modeling of Microgrid & Role of Renewable Energy Sources**

Modeling and simulation of Renewable Energy Systems for designing of a hybrid power generation system based on nonconventional (renewable) solar photovoltaic and wind turbine energy reliable sources was demonstrated by Mr. Reddy using MATLAB 2021b version. He explained the advanced features introduced by MATLAB for analysis and modelling of Microgrid system. The system modelling on Simulink Blocks for designing of renewable energy systems were discussed for Power

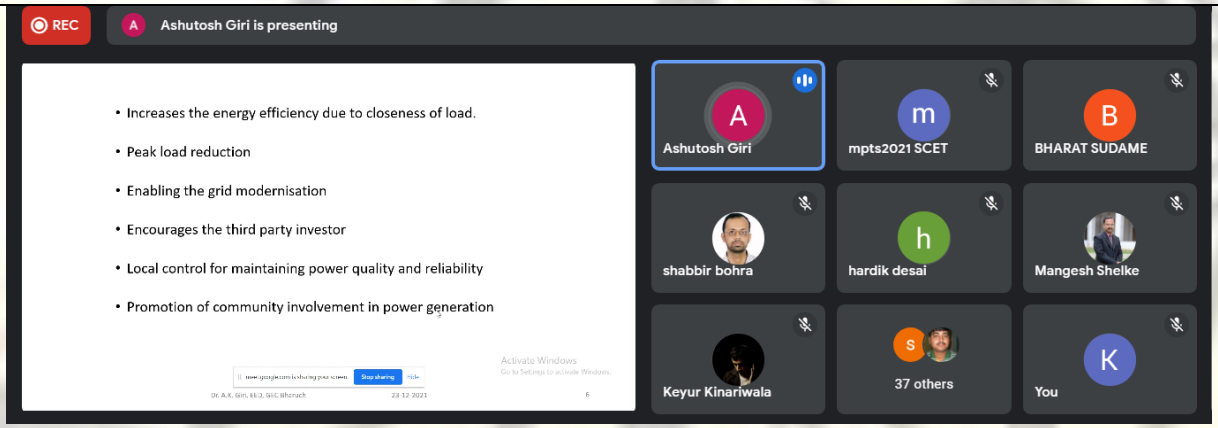
Generation using on Renewable Energy Systems (PV and Wind), PV Array and implementation of PV array modules using MATLAB and Simulink and Wind Turbine model of variable pitch operation was also explained.



Speaker: Dr. Premalata Jena, IIT-Roorkee

Session S9: Dr. Premalata Jena on Introduction to Smart Grid Technology

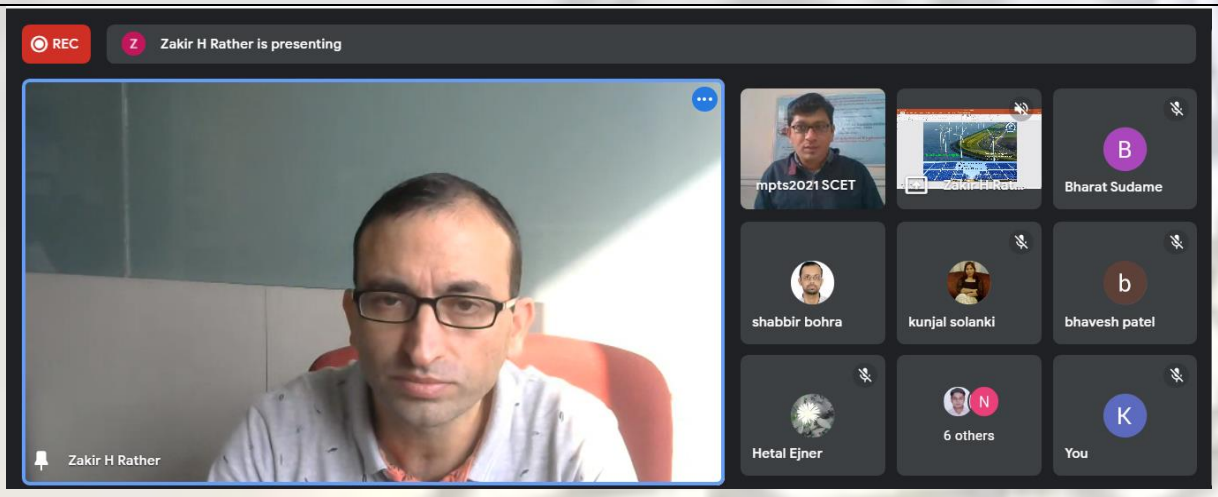
Dr. Jena has been working in Smart Grid systems and hence she began her session with sharing data of total installed generation capacity of India and individual shares of renewable energy sources. She discussed about nanogrid and part of microgrid to transform existing system into Smart Grid System. She had also made participants aware about various key parameters of Smart Grid such as efficiency, reliability



Speaker: Dr. Ashutosh Giri GEC, Bharuch

Session S11: Dr. Ashutosh Giri on Role of Intelligent Techniques in Microgrid

Dr. Giri enlisted various potential research areas in microgrid, especially intelligent control techniques. He has started with primary, secondary and tertiary controls involved and then took the participants to intelligent adaptive adaline control algorithm, back propogation feed forward network controllerand MLMS adaptive control algorithm for power quality of microgrid. He also demonstrated laboratory prototype of microgrid system and various sensors, such as voltage and current for interfacing with controller. His talk was revolved around wind turbine for grid interfaced system.



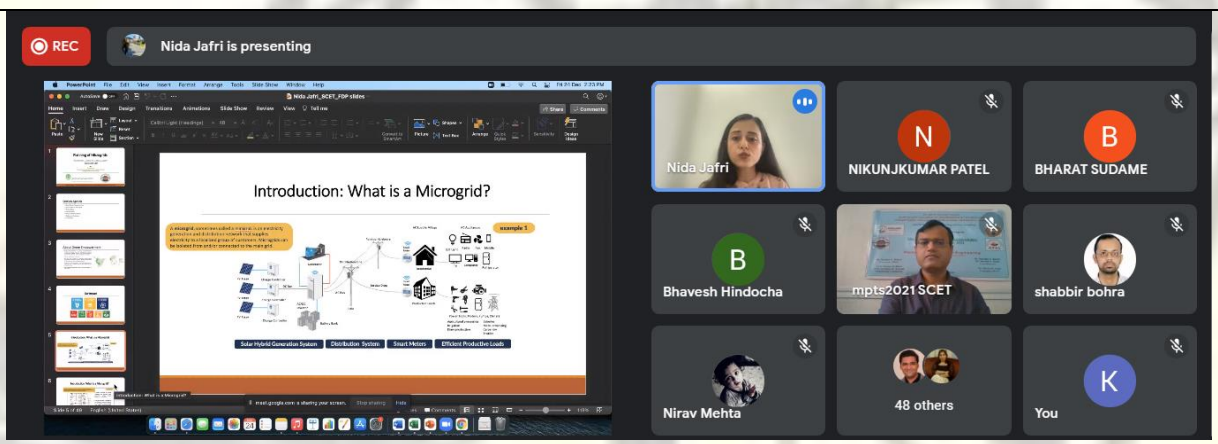
Speaker : Dr. Zakir H Rather,IIT-Mumbai

Session S13_a: Dr. Zakir H Rather on Inertia of Microgrid

Dr. Zakir has been working in the area of impact and improvement of Electrical Inertia in Microgrid system. He explained about the role of inertia in traditional huge grid connected power system under healthy and abnormal conditions, such as faults. This inertia value dramatically reduces in microgrid environment due to involvement of power electronic based systems, inverters. He discussed certain methods to improve this parameter either by shifting operating point to other or incorporating energy storage devices into system. He also touched upon a little about estimating the value of inertia.

Session S13_b: Dr. Shabbir S. Bohra/Dr. Hardik P. Desai

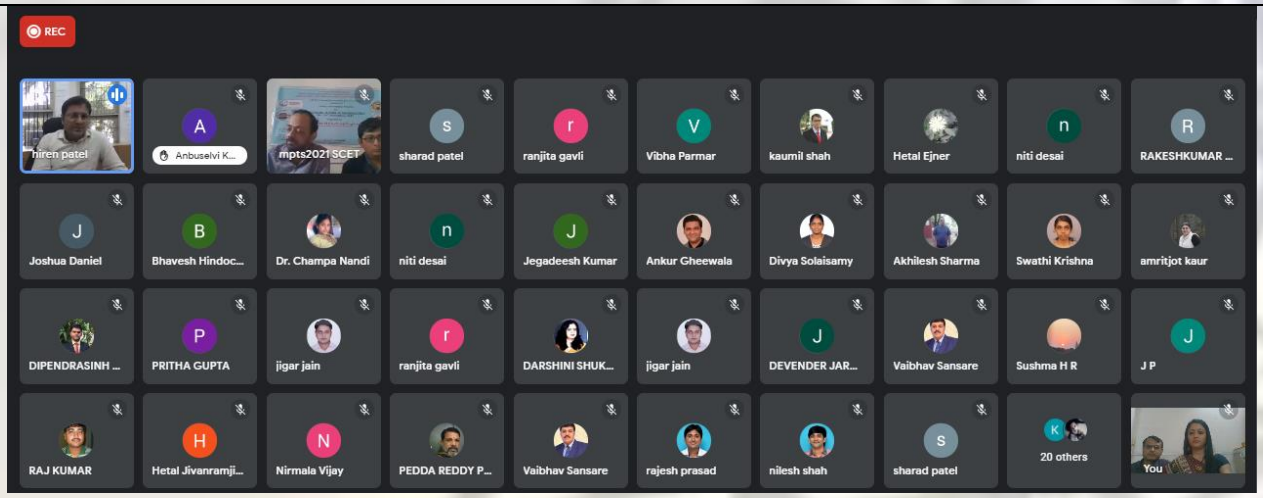
This session mainly was on various case studies of planning of microgrid using MCDM techniques and HOMER Pro software. The salient features such as simulation, optimisation and sensitivity analysis of one of the most widely used tool HOMER was disscussed. Moreover, vaious sources, important input prameters to get reilable and close to real solutions were explored and discussed.



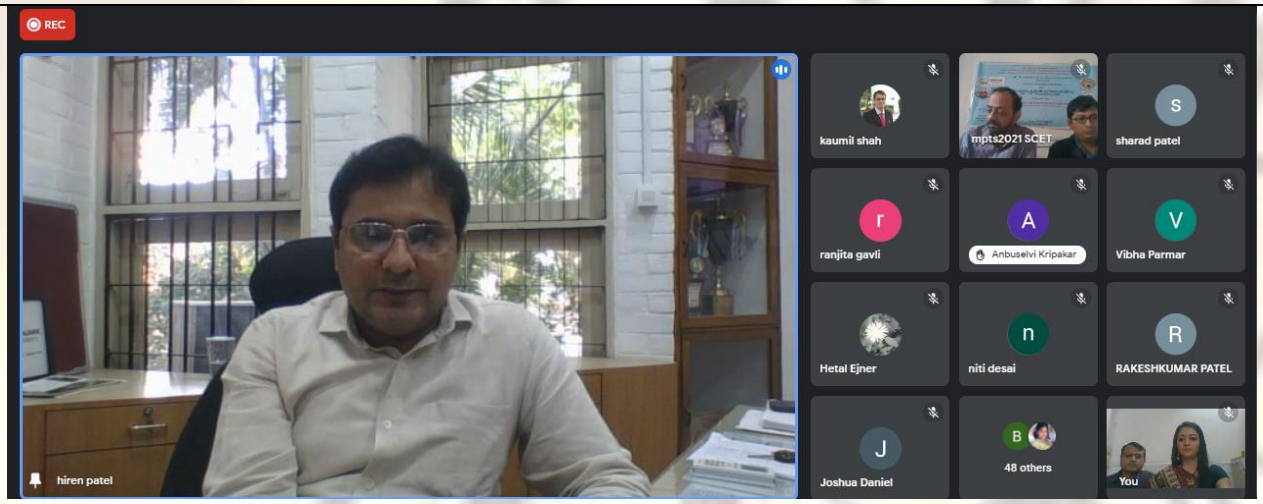
Speaker : Dr. Nida Jafri, Green Empowerment,Malaysia

Session S14: Dr. Nida Jafri on Planning of Microgrid

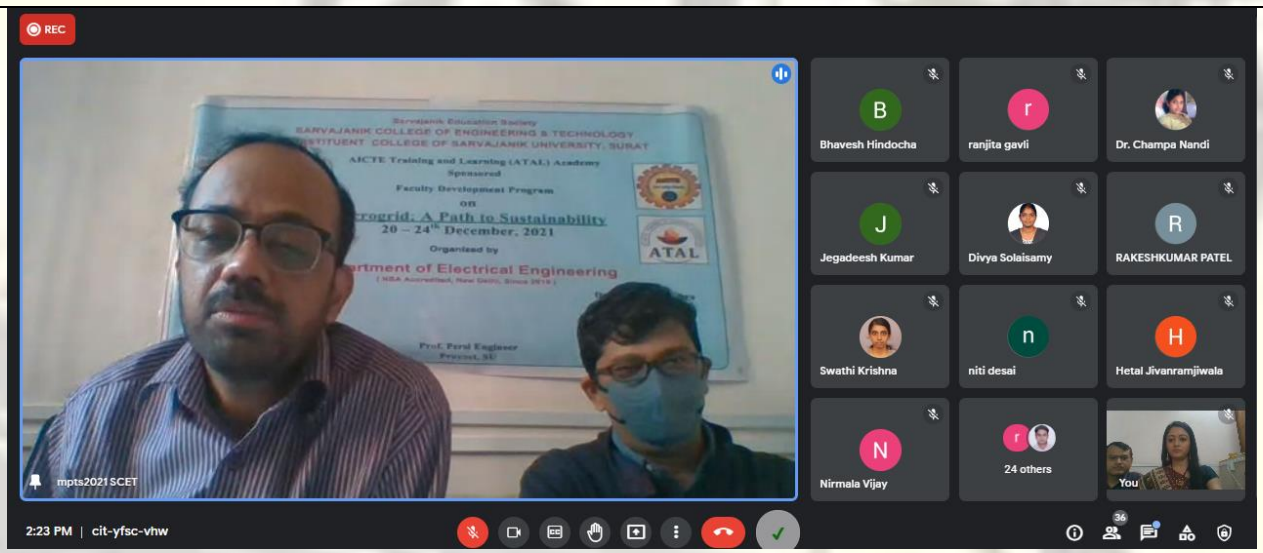
Dr. Nida has been working with Green Empowerment, Malaysia. She talked about fundamentals of microgrid, methodologies adopted for establishing microgrid for rural areas. She explained importance of load management and demand analysis. Furthermore, the planning tool such as HOMER was also discussed mainly for cost analysis in brief. She briefed about technical, financial, policy and regulatory challenges and barriers for development of Microgrids.



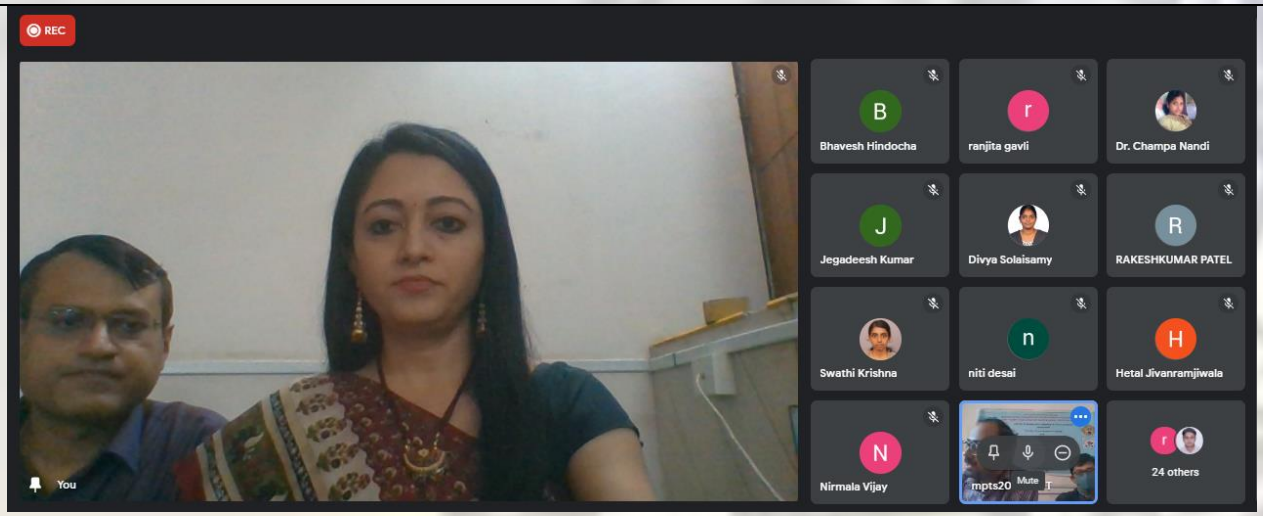
Valedictory



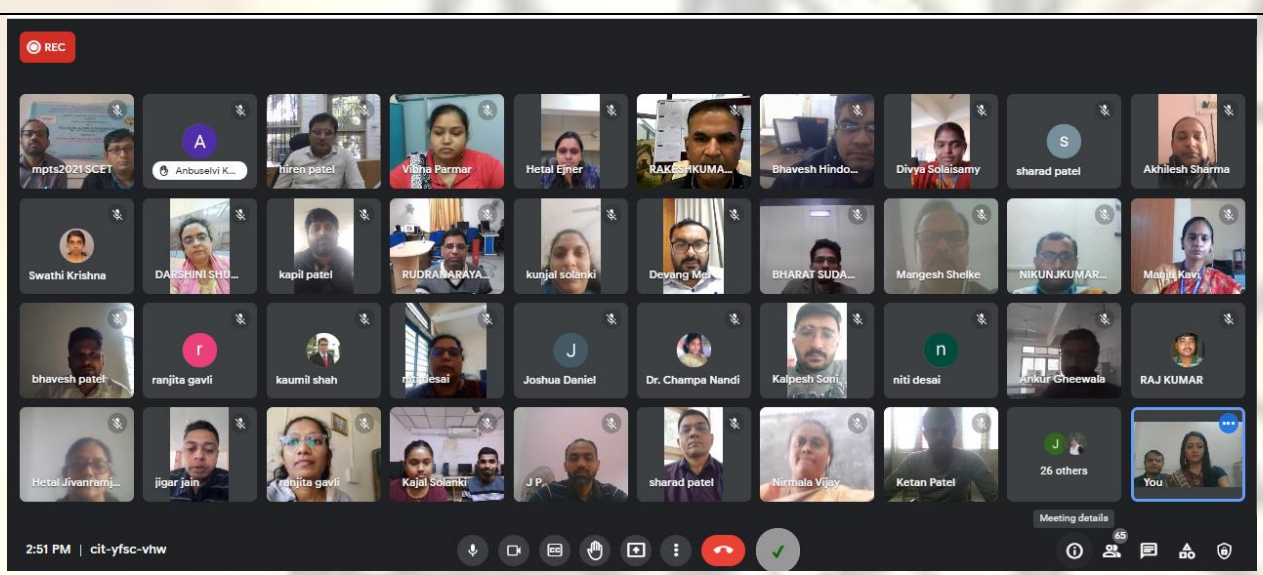
Valedictory : Dr. Hiren Patel, Principal, SCET

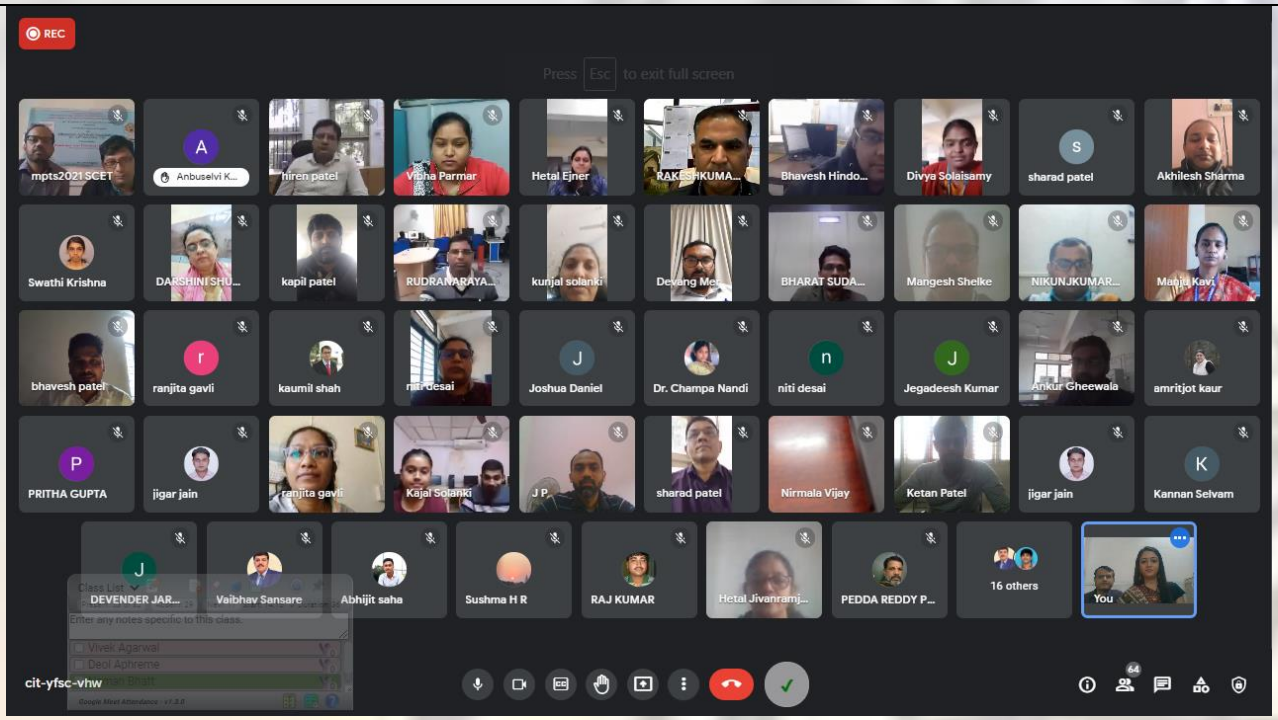


Valedictory : Co-ordinators
Dr. Shabbir S. Bohra, Professor & Head, EED
Dr. Hardik P. Desai, Associate Professor, EED



Valedictory : Organising Committee: Prof. Naman B. Bhatt, Prof. Krishna Trivedi

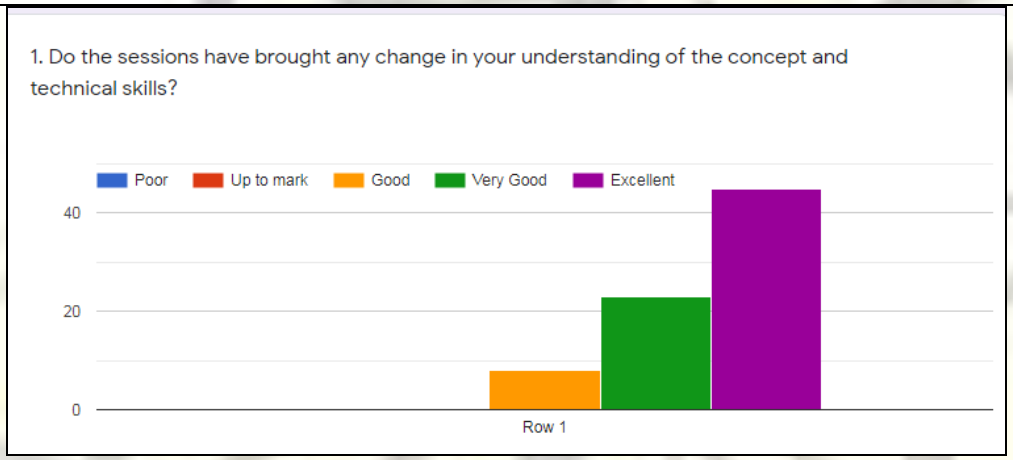




Our Dear Participants

Feedback of the FDP

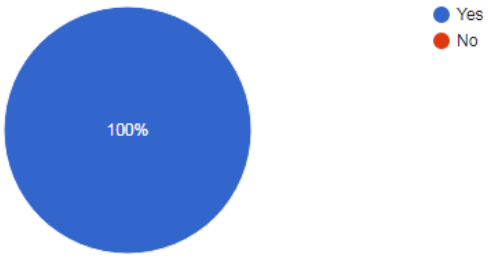
The feedback of the FDP is pretty good. Participants appreciated the content, delivery, quality of experts and learning outcome from the FDP. The detailed feedback analysis is mentioned as under:



2. Rate the content of the sessions on the basis of usefulness and interest.

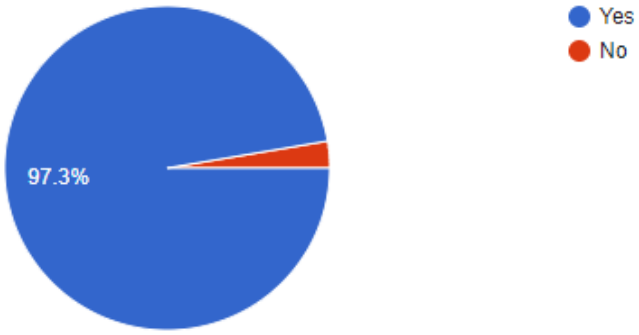
3. Is the session well structured and well organized?

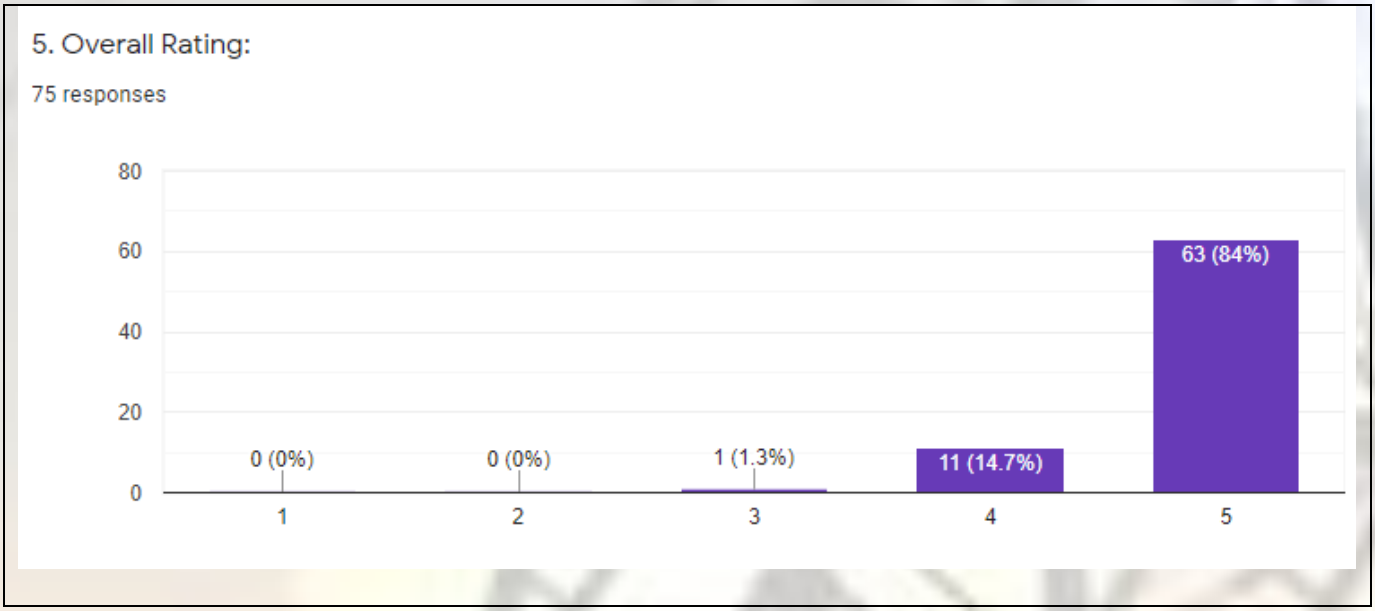
75 responses



4. Was adequate time provided for question and discussion?

75 responses





Acknowledgement

Department of Electrical Engineering, SCET is very much thankful to **AICTE/ATAL** for accepting our application and extending financial aid for organising this FDP for the benefit of teaching community, research scholars and even interested students. The FDP has helped faculties and research scholars for enhancing their expertise in the area of "**Microgrid: A Path to Sustainability**" and also helps to the students who want to perceive their career in the domain of microgrid and its various aspects. We would also like to thank Sarvajanik University, SCET management and **Dr. Hiren Patel**, Principal, SCET for encouraging such knowledge sharing activity for skill development of fraternity.

Report Compiled by FDP Team

Co-ordinators	Organising Committee
Dr. Shabbir S. Bohra	***Prof. Naman B. Bhatt***
Professor & Head, EED	***Prof. Krishna Trivedi***
Dr. Hardik P. Desai	
Associate Professor, EED	