A Report of

IES-IAS-PELS Joint Chapter
IEEE Gujarat Section
&
Marwadi University
Jointly Sponsored

2 Days Workshop

On

Transforming EV Charging with Cutting-Edge Technologies

13th and 14th November, 2024

Organised by
Department of Electrical Engineering,
FOET, Marwadi University, Rajkot

Prepared by
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Title of Workshop: Transforming EV Charging with Cutting-Edge Technologies

Objective:

Electric vehicle (EV) technology is evolving rapidly, with new trends and developments emerging regularly. A strong charging infrastructure is necessary for the growth of the EV market. For Students to dive in this growing field of EV and its charging facility, they need to gain the latest skills demanded by this field. Hence, this workshop program was designed for the students who want skills enhancement to move into one of the fastest growing markets of Electric vehicles to impart the knowledge of existing & prospective EV Charging cutting edge technologies. This course has covered the fundamentals of Electric Vehicles and the Basics of Battery driven Electric Vehicle and its Power Electronics, Batteries, Charging topologies etc. The workshop program has included classroom training with lecture sessions as well as demonstrations.

Experts:

Expert from various EV Industries as well as reputed Universities had given valuable information and updates, and shared cutting-edge research and surveys on the area of electric vehicle and its charging technologies. The list of experts from various organisations are as under:

Sr. No.	Name	Affiliation
1	Dr. R. Narayanmoorthi	Associate Professor, SRM Institute of Science and Technology, Chennai
2	Mr. Parth Trivedi	CTO, Griden Technology Pvt. Ltd.
3	Ms. Krupa Bhatt	Technical Engineer, BYD
4	Dr. Tapankumar Trivedi	Associate Professor, Marwadi University
5	Mr. Anand Bhatt	MG Motors
6	Mr. Jay Nathwani	Tata Motors Pvt. Ltd.
7	Dr. Rushikesh Ved	SR Charging Stations

Topic Covered:

1. Electrifying the Future Understanding the EV Landscape
2. Bidirectional Converter topology for EV Charger
3. Demonstration of on board Charging of Tata Nexon and MG Comet EV Car.
4. Research aspects of wireless Charging system for EV
5. 360-degree insight of EV charging
6. AC/DC Charging Stations

Participants:

The students from final year as well as pre-final year B.Tech Electrical Engineering programme has participated in this workshop. A total of 35 students (05 IEEE members and 30 Non- IEEE members) had participated in this workshop with full dedication towards learning.

Organising and Coordinating Team:

The members of organising committee were Dr. Nishant Kothari, Head EED, Marwadi University, Dr. Amit Ved,Vice Chair, IES/IAS/PELS Societies Joint Chapter, IEEE Gujarat Section, Dr. Mahmadasraf A. Mulla, Dr. Priyesh Chauhan, Dr. Pallavi Bharadwaj, Dr. Aeidapu M, Dr. Manisha Shah, and Dr. Manisha Shukla.

The Workshop program was coordinated by Dr. Atul Kunpara along with Prof. Uvesh Sipai from EED, Marwadi University.

Summary of the Sessions:

Day-1

The first day of workshop was started with an inaugural function which was hosted by final year student Ms. Rimple Gojiya. Function was started with the prayer followed by welcome speech of Dr. Nishant Kothari, Head, EED, Marwadi University. He had encouraged students to actively participate in workshop and gain maximum benefit of it. Inaugural function ended with brief overview of workshop by Dr. Atul Kunpara in which he enlightened participants about different sessions of workshop. Dr. Amit Ved had discussed about activities of Joint chapter of IAS/IES/PELS, IEEE Gujarat Section

Session-1:

In the First Session, Ms. Krupa Bhatt had provided vast information about role and responsibilities of different departments and sections of EV manufacturing company. She also has briefed the participants about basic skills that requires to work in EV industries.

Session-2:

In second session, Dr. Tapan Trivedi hasd discussed importance of bidirectional charging topologies along with the detailed working of Dual Active Bridge Converter topology. He also explained the benefits of V2G power transfer and its aspects.

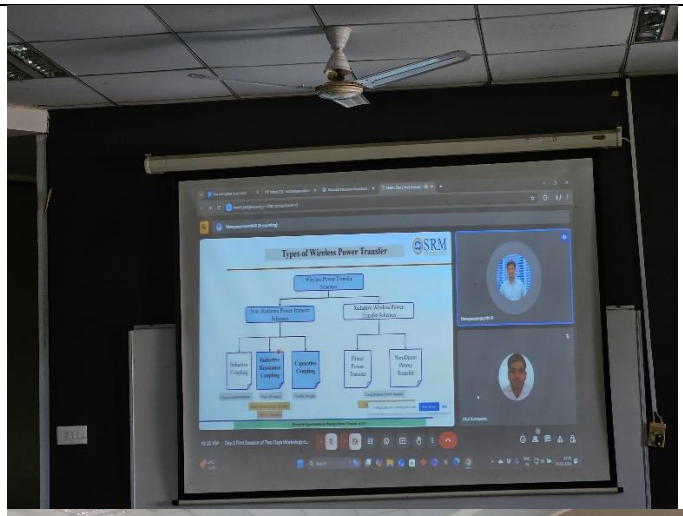
Session-3:

In third session, Mr. Anand Bhatt from MG motors and Mr. Jay Nathwani from Tata motors have demonstrated the on-board charger provided by cars and its connectors. They also discussed about the km range of car in one charging with time taken for full charge the battery pack.

Day-2

Session-4:

In the fourth Session, Dr. R. Narayanmoorthi had provided vast information about wireless charging technologies. He explained various types of core design used in wireless charging pad. Also, he has discussed different types of converters used for input side of wireless charging system.



Session-5:

In fifth session, Mr. Parth Trivedi had described various types of chargers used for EV. He clarified the difference between AC charging and DC charging of EV with on board and off board charging system.

Session-6:

In sixth session, Dr. Rushikesh Ved and his Team member Mr. Dave had conducted a very interactive session covering essential requirement of DC fast charging station and its installation process.

Outcomes from the Workshop:

After successful completion of the workshop participants learned:

1. To discriminate between AC charging and DC fast charging of EV car.
2. About important skills required in the field of EV charging technologies.
3. Various types and range of power connector for EV charger.
4. On board and Off board chargers.
5. Need and benefits of bidirectional charging technologies.
6. Installation process of DC charging stations.

Feedback:
"This have been an absolutely amazing & enlightening workshop. A very informative and valuable 2 days. I really enjoyed the sessions specifically demonstration session" these were the sentences we heard from participants. Almost all participants were happy to learn something new about EV charging technologies.

Concluding Remarks:
We would like to express our sincere gratitude to Dr. R. B. Jadeja Sir, Vice-Chanceller, Marwadi Unviersity who had permitted us to organise this workshop. Students have given very positive feedback for the workshop. They had gained insight of business aspect of EV chargers, overview of EV industry and EV chargers' industry, Design, maintenance and operation of aspect of various thpes of EV chargers. Students also expressed their interest to participate in more such activity which is targeted to certain area and is helping to gain skilling. Industry representatives had offered to visit their facility and also internship opportunity to students.