Overview of the Course

The demand for charging infrastructure, including charging stations in parking structures and garages, is more important as electric vehicles on the road multiply. For long-distance commuters, an available charging station may be a critical requirement to ensure the ability to finish the round trip. This course is designed to teach how to implement on-board and off-board chargers for vehicular applications. It will help to prepare today’s power electronics design engineers in the vehicular industry, which is the demand of the present scenario. The course contains basic of Power Electronics and its role in Electric Vehicles, EV charging methods, etc.

The participation fees for taking the course are as follows:
- Participants from abroad: US$100
- Industry/Research Organizations: Rs. 2950/-
- Faculty from Indian academic Institutions: Rs.1180/-
- Research Scholars and students: Rs.590/- (Including GST)

Objectives of the Course

- Exposing participants to the state-of-the-art of power electronics converters for EVs.
- Introduce recent advances in power electronics circuit topologies and challenges regarding EV infrastructure implementation.
- Introduce the status of the selecting components and switches.
- Explain challenges and considerations for selection of gate drivers with the performance of the switch for the full-load variation.
- Discuss reliability issues and circuit design for improved reliability.

Foreign Expert

Dr. Akshay Kumar Rathore (Affiliate Professor)
Department of Electrical and Computer Engineering at Concordia University, Montreal, Canada.

Course Coordinators

Dr. Arun Kumar Verma (Assistant Professor) & Dr. Sandeep N (Assistant Professor)
Dr. Saravanan Prakash P (Assistant Professor)
Dr. Kapil Shukla (Assistant Professor)
Department of Electrical Engineering
Malaviya National Institute of Technology, Jaipur (Rajasthan)

Registration Form

Name (In Block Letters): ..................................................
Designation: ..................................................
Qualification: ..................................................
Institution: ..................................................
Address: ..................................................
Email address: ..................................................
Mobile No: ..................................................

Details of Demand Draft:

DD No/Transaction ID: ..................................................
Bank Name: ..................................................
Amount Rs: ..................................................
Date: ..................................................

Signature of the Candidate

**Participants are required to fill an online registration form by clicking on the following link: [https://forms.gle/BWSPcuXzkbCq4ePF9](https://forms.gle/BWSPcuXzkbCq4ePF9)**

Participants are requested to transfer the registration amount in the following account:
- Account Name: Registrar (Sponsored research) MNIT Jaipur
- Account no: 676801700388
- Bank name: ICICI Bank Ltd., MNIT Jaipur
- IFSC code: ICIC0006768
- Branch name: MREC branch, Malaviya National Institute of Technology Jaipur, J.L.N. Marg, 302017.
## Evolution of Power Electronics for Electric Vehicles Charging Infrastructure

**[2nd January to 6th January, 2022]**

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Inaugural session</th>
<th>Dr. Akshay Kumar Rathore</th>
<th>Dr. Arun Kumar Verma</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>January 2, 2023</strong></td>
<td>10:00 AM – 12:00 PM</td>
<td>Inaugural session</td>
<td>Recent development of SiC and GaN devices, evaluation methods and modeling of SiC devices, effect of GaN devices on the present generation topologies.</td>
<td>Emphasis on switch selection for electric vehicle battery charging.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dr. Akshay Kumar Rathore</td>
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<tr>
<td></td>
<td>01:30 PM – 02:30 PM</td>
<td>Dr. Akshay Kumar Rathore</td>
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<td>Dr. Arun Kumar Verma</td>
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<tr>
<td></td>
<td>03:00 PM – 05:00 PM</td>
<td>Dr. Arun Kumar Verma</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>January 3, 2023</strong></td>
<td></td>
<td>Dr. Akshay Kumar Rathore</td>
<td>Introduction of battery load, Behavior of conventional voltage and current source converter with phase shift modulation for battery load.</td>
<td>Different communication techniques and their advancement for electric vehicle battery charging.</td>
</tr>
<tr>
<td><strong>January 4, 2023</strong></td>
<td></td>
<td>Dr. Akshay Kumar Rathore</td>
<td>Evolution of current source converter for wireless charging topologies.</td>
<td></td>
</tr>
<tr>
<td><strong>January 5, 2023</strong></td>
<td></td>
<td>Dr. Akshay Kumar Rathore</td>
<td>An introduction for interleaved converter configurations for electric vehicle applications with its advantage and disadvantage.</td>
<td></td>
</tr>
<tr>
<td><strong>January 6, 2023</strong></td>
<td></td>
<td>Dr. Akshay Kumar Rathore</td>
<td>Evolution of topological advancement for off-board chargers and associated control techniques. Challenges of power electronics for electric vehicle applications.</td>
<td></td>
</tr>
<tr>
<td><strong>January 4, 2023</strong></td>
<td></td>
<td>Dr. Arun Kumar Verma</td>
<td>Designing of boost converter-based converter topology for grid-to-vehicle and vehicle-to-grid applications.</td>
<td></td>
</tr>
<tr>
<td><strong>January 5, 2023</strong></td>
<td></td>
<td>Dr. Arun Kumar Verma</td>
<td>Designing of control scheme for a dc-dc converter connected to V2G and G2V with its merits and demerits.</td>
<td></td>
</tr>
<tr>
<td><strong>Valedictory Session</strong></td>
<td></td>
<td>Dr. Arun Kumar Verma</td>
<td>Valedictory Session</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** An online quiz will be scheduled on 6th January 2022.

**Please email the snapshot of transaction and the signed registration form to Dr. Arun Kumar Verma at arun.ee@mnit.ac.in or seasrlab.ee@mnit.ac.in**

**Participants are also WhatsApp the snapshot of transaction and the signed registration form at 805820645 or 9521886574.**