



# Gian Course on CHARGING SYSTEMS FOR ELECTRIC VEHICLES December 7-12, 2016

## Course Overview

[[Course ID: 161027D01](#)]

In present years, the deployment of electric vehicles (EVs) is arisen globally due to the stressing of the environmental concerns and the demand of energy-efficient road transportation. A vehicle is termed as an electric vehicle if it uses electric motors to drive the wheels directly or through differential gears by receiving energy, either fully contributed by the on-board DC source or contributed in part by the lower sized IC engine as compared to the conventional ICE based vehicles, with the objective of improved performance and reduced emissions. Vehicle is termed as Pure/Battery Electric Vehicle (BEV), if whole of the required energy for the traction is contributed by the on-board DC source; and is termed as Hybrid Electric Vehicle (HEV), if a part of the energy for the traction is contributed by the ICE. In most of the cases of HEVs on-board batteries receives charge from the IC engines. Whereas BEVs are required to be charged from the grid. Vehicle charging can be done through wire (conductive charging) or without wires (wireless/contactless charging). One of the biggest hurdle for the EVs to be competitive with IC engine based vehicles is driving range/autonomy. To overcome this issues fast charging strategies are being adopted and also have pros and cons in terms of service and life of the batteries. Dynamic charging, charging while in motion strategies are another solution to overcome the issues of limited autonomy of the vehicles. This course will cover the battery charging technologies for electric vehicles, giving an overview on their evolutionary process. At first, the wired technology will be introduced and the main existing standards on it (charging modes, connection cases and plug types) will be discussed. Then the wireless power transfer technology will be illustrated, showing the convenience of the resonant coupling topologies in increasing the power transfer efficiency. At last, the in-moving technology will be introduced and the preliminary studies on it will be addressed.

### Modules

A: Electric vehicles	DEC-07	<i>Tutorials will be organized during different topics of the course to stimulate research motivation of participants.</i> There will be total 20 hours of Lectures and Tutorial <b>The course inauguration and desk registration will take place on Dec 06, 2016 (Evening).</b> <b>Evaluation Examination will be on December 12, 2016, morning session</b>
B: Storage devices (batteries and supercapacitors)	DEC-07	
C: From-grid charging of storage device	DEC-08	
D: User safety and management of storage device charging	DEC-08	
E: Conductive EV battery charger	DEC-09	
F: Conductive EV battery charger standards	DEC-09	
G: Wireless battery charging	DEC-10	
H: Static wireless EV battery charger	DEC-10	
I: On-road wireless EV battery charging: topologies	DEC-11	
J: On-road wireless EV battery charging: solutions	DEC-11	

### You Should Attend If...

- You are a student (B.Tech/M.Sc./M.Tech/Ph.D.) and aspiring researcher within broad domain of communication engineering.
- You are an Executive/engineer or researcher from manufacturing, service and government organizations including R&D laboratories.
- You are Faculty and staff from reputed academic institutions and technical institutions.

### Fees

The participation fees per person for attending the course is as follows:

**Participants from abroad : US \$300**

**Industry/ Research Organizations: Rs. 5000/-**

**Academic Institutions:**

**Students : Rs. 1000/- (For SC/ST students course fee is Rs. 500/- only)**

**Non-Students : Rs. 3000/-**

**For five days Lunch, each participant will be charged Rs. 800/- only in addition to the course fees.**

The above fees include all instructional materials, computer use for tutorials, free internet facility.

The participants will be provided with single bedded shared accommodation and dinner on additional payment basis.

# The Faculty



**Prof. Giuseppe Buja (Life Fellow, IEEE)** is Full Professor at the University of Padova, Italy, where he holds classes on Electric Systems for Automation and Electric Road Vehicles. His scientific interests are power and industrial electronics, with applications to industry and vehicles. His current research issues are grid-connected converters for renewable sources, and wired/wireless charging systems for electric vehicles. He is a Life IEEE Fellow and has received the Dr. Mittelmann Achievement Award from IEEE Industrial Electronics Society "in recognition of his outstanding technical contributions to the field of industrial electronics". Prof. Buja has co-founded the IEEE International Symposium "Diagnostics of Electrical Machines, Power Electronics and Drives" and of the International Conference "Power Electronics and Motion Control", and has chaired International Conferences and Committees, including the Annual Conference of the IEEE-IES (IECON). Presently, he is a Senior Member of the AdCom of the IEEE-IES, an Associate Editor of the "IEEE Transactions of Industrial Electronics", and a member of a number of Scientific and/or Steering Committee of International Conferences.



**Ritesh Kumar Keshri** received B.Sc (Engg.) and M.Tech from National Institute of Technology, Jamshedpur, India, in 2003 and 2007 respectively both in electrical engineering and PhD in Energy Engineering from Department of Industrial Engineering, University of Padova, Italy in March 2014. Since August 2015 he is with Department of Electrical Engineering, Visvesvaraya National Institute of Technology Nagpur as an Assistant Professor. From 2006 to August 2015 he was with Department of Electrical and Electronics Engineering, BIT Mesra, India as an Assistant Professor. Dr. Keshri received silver medal for being first in M. Tech (electrical) in 2007, Young researcher fellowship from Ministry of University of Italy in 2008, Erasmus Mundus Fellowship for 34 months, from European Union in 2010, first prize as a student team leader of the University of Padova in class-3 of Formula Electric and Hybrid in 2011, and 2016 Best paper award of IEEE Transaction on Industrial Electronics. His research interests include power electronics and electric drives for electric vehicle propulsion and renewable. Dr. Keshri is associated with IEEE -IES and -PELS, and contributed as chairs for technical track and special sessions in IECON 2013, 2014, 2015 and 16. Dr. Keshri have been Chair, Conference activities for Technical committee on Transportation Electrification of Industrial Electronics Society (TCTE) IEEE during 2014-15 and is associated as Secretary for TCTE and Chair sub-committee for EV/HEV/FCEV of TCTE.



**Hiralal Murlidhar Suryawanshi** received the B.E. degree in electrical engineering from Walchand College of Engineering, Sangli, India, in 1988, the M.E. degree in electrical engineering from the Indian Institute of Science, Bangalore, India, in 1994, and the Ph.D. degree in electrical engineering from RTM Nagpur University, Nagpur, India, in 1999. He has teaching and research experience of about 27 years. Currently, he is a Dean (Research and Consultancy) at Visvesvaraya National Institute of Technology, Nagpur, where he is a Professor in the Department of Electrical Engineering. His research interests include the field of power electronics, resonant converters, multilevel converters, and condition monitoring of electrical machines. Dr. Suryawanshi was awarded the Fellow of the Indian National Academy of Engineering (FNAE) in 2012. Currently, he is an Associate Editor of the IEEE Transactions on Industrial Electronics.

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Course coordinator  
**Dr. Ritesh Kumar Keshri**

Host Faculty  
**Prof. H.M. Suryawanshi**

## For registration fee payment:

Mode#1: Demand draft in favor of Director VNIT Nagpur, payable at Nagpur

Mode#2: Electronic Payment (NEFT)

Name of the Beneficiary: Director, VNIT  
Name of Bank: State Bank of India  
Branch Name: VRCE Branch, Nagpur  
Branch Code: 06702  
Beneficiary Account No. 10259420288  
Bank MICR Code: 440002005  
Bank IFSC: SBIN0006702

### Note:

For NEFT transfers all the transaction details are to be sent. Preferable mode of Payment is Demand Draft.

For the confirmation of registration, the proof of payment (a scanned copy of the Demand Draft/ NEFT transaction Details) along with the registration form and Copy of PDF generated at GIAN portal are to be sent to [riteshkeshri@gmail.com](mailto:riteshkeshri@gmail.com)

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For Registration:

<http://www.gian.iitkgp.ac.in/GREGN>

For more details:

<http://www.vnit.ac.in>

## Contact address

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