V2EVEL06 SMART GRID INTERFACE OF ELECTRIC VEHICLES

MODULE I: Introduction to the Smart Grid using EVs (6 Hours)
The Smart Grid and Microgrid, Impact of EVs on Distributed Energy Resources in the Smart Grid, V2G Technology and PEVs Charging Infrastructures.

MODULE-II: Impact of EV and V2G on the Smart Grid and Renewable Energy Systems (7 Hours)
Types of Electric Vehicles, Motor Vehicle Ownership and EV Migration, Impact of Estimated EVs on Electrical Network, Impact on Drivers and the Smart Grid

MODULE-III: Power Conversion Technology in the Smart Grid and EV (8 Hours)
Dynamical Modelling of EV Connected to Single-Phase Smart Grid Node, Dynamical Modelling of EV Connected to Three-Phase Smart Grid Node, Power Conversion Problem Formulation in Smart Grids with Evs.

MODULE-IV: Power Control and Monitoring of the Smart Grid with Evs (10 Hours)
Impacts of EV Penetration on Grid Power Profile and Requirements of Its Control and Monitoring Vehicle-to-Grid: Linking Electric Vehicles to the Smart Grid. Voltage and Frequency Regulation, Supporting and Balancing of Intermittent RES.

MODULE-V : EV Charging Technologies and V2G on Distributed Systems and Utility Interfaces (11 Hours)
Vehicle-to-Grid Concept and EV Communication Requirements, Distributed Generation and the Smart Grid, Charging Diversity and Utility Interfaces, Local, Central and Distributed Generation, Current PEV Charging Standards, Socket Types, Contact-Based PEV Charging, Rectifier Topologies for G2V, Inverter Topologies for V2G, DC/DC Converters.

TEXT BOOKS

1. Hossain, Jahangir Lu, Junwei, “Vehicle-to-Grid Linking Electric Vehicles to the Smart Grid,” Published by The Institution of Engineering and Technology, London, United Kingdom, 2015.
2. Qiuwei Wu, “Grid integration of Electric vehicles in Open electricity markets, ” John Wiley & Sons Ltd, The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, United Kingdom, 2013.
3. Canbing Li, Yijia Cao, Yonghong Kuang Bin Zhou, “Influences of Electric Vehicles on Power System and Key Technologies of Vehicle-to-Grid,” Jointly published with Science Press, Beijing and Springer-Verlag Berlin Heidelberg 2016.