



# WORKSHOP ON Smart Microgrids

APRIL 8 – 10, 2016

Organized by Department of Electrical Engineering, IIT Kanpur



Distributed power generation systems, comprising of small generation and storage units, are gaining popularity due to increasing energy demand. Low distribution losses, high reliability, reduced chances of blackout, easy scalability, and remote electrification are the key advantages of the distributed systems. To interconnect sources and storage elements of dissimilar electrical characteristics, power electronics converters (PEC) (such as ac–dc, ac–ac, etc.) are included between each source/storage and the microgrid. Microgrid includes the control and coordination of distributed generation and storage units to achieve various control objectives. Key objectives are power scheduling, power sharing among sources, voltage regulation, frequency regulation, and stable operation of the microgrid. To achieve the aforementioned objectives, hierarchical structure of controllers is used. In the recent years, depleting fossil fuels, ever-increasing energy demand, and concern over climate change necessitate a substantial percentage of the power to be generated by renewable sources. Coordinated control of renewable source, conventional sources, storage, and loads brings various research challenges in the area of Microgrids. Other important issues are protection within microgrid and interaction of various microgrids to form a Smart Grid / Microgrid. Inclusion of communication, coordination of distributed energy sources, and monitoring of system parameters to address the operational and stability issues makes it a Smart Microgrid.

The aim of this workshop is to provide exposure to faculty members, practising engineers, and students to the concepts of Smart Microgrids. This course begins with an overview of Microgrids. Recent advancements in the area of microgrids will be provided. Some of the focus areas of the workshop will be the power electronic converters for nanogrid applications, various control challenges, possibility of using advanced control techniques, such as coordinated control, transient stability of the microgrid, protection issues, and solutions for interconnection of microgrids. In addition, this workshop will include various laboratory demonstrations. Use of Real Time Digital Simulation (RTDS) for control and protection of Smart Microgrids will be demonstrated. Further, power electronic converters to interface various sources with microgrid will be demonstrated in laboratory.

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## Web Page & Registration:

<http://home.iitk.ac.in/~asandeep/ws/>

## Last Date for Registration

March 7<sup>th</sup>, 2016

## Registration Fee \*\*

Academia	Rs. 11,450/-
Industry	Rs. 17,175/-
Student	Rs. 9,160/-

## Coordinators

**Dr. S. Anand , Dr. S. Chakrabarti,**  
and **Dr. S. R. Sahoo**, IIT Kanpur

## Contact

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**\*\*Registration Fee includes course fee, accommodation, food, printed lecture notes and stationary.**

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**Target Audience:** Faculty members, practicing engineers & students.