

A Brief report on One week Short term course on
“Recent Advances in Renewable Energy and Power Systems”
(February 11- 16, 2019)

A short term training program was organised during 11-16, February 2019 in the Department of Electrical Engineering, National Institute of Technology (NIT) Raipur, Chhattisgarh (India), under the aegis of NIT Raipur and IEEE Bombay Section. The program was coordinated by Prof. S. V. Kulkarni from IEEE Bombay Section and by Dr. Monalisa Biswal and Dr. Ebha Koley from NIT Raipur. The program was inaugurated by the Chief Guest Dr. S. Gupta, Dean R & C, NIT Raipur, Chhattisgarh (India). From the total 39 participants, 37 were M.tech/ Ph.D research scholars and 2 were faculty members from various reputed academic institutes of India. It gave exposure to recent advancements in power systems and related areas. The program included lectures on the following topics: Artificial Intelligence, Machine Learning and Deep Learning including hands on sessions and tutorials on a python simulator, transformer diagnostics, Finite Element Method (FEM), energy and environmental issues and sustainable solutions, renewable energy integration, and storage systems in active distribution networks.

Day 1: 11th Feb. 2019

In the inaugural function, Dr. S. Gupta welcomed the guests and registered participants. Dr. N. D. Londhe, HOD Electrical appealed participants to take maximum advantage of expertise of speakers to upgrade knowledge. Dr. M. Biswal gave opening remarks and briefed about the course contents and objectives of the training program. Prof. Santhosh Chapaneri, SFIT, Mumbai, gave a presentation on “Deep learning for computer vision”. He explained the importance of deep learning in various field applications. The day closed with a lab session on Python Software at Computer Laboratory. There the participants learned the Python tool and understood/ executed different programs related to deep learning.



Day 2: 12th Feb. 2019

The day began with a presentation on Machine Learning by Prof. Sanjay Shitole, UMIT, Mumbai. He explained the importance of Machine Learning and how to develop accurate solutions for different applications. He also explained how to develop algorithms to obtain accurate results.



Day 3: 13th Feb. 2019

First Session: Dr. Prashant Agnihotri, Assistant Professor, IIT Bhilai, gave a talk on the Indian Grid collapse on 30th and 31st July 2012. The analysis reports about the blackout event were discussed. Further, he explained about possible solutions that can prevent such blackout events. He highlighted the advent of wide area measurements in monitoring, control and protection. A detailed discussion on system stability with wind source integration was also done.



Second Session: Dr. Ravi Kumar Bhimasinghu, Associate Professor, IIT Hyderabad, explained in detail about hardware aspects of PV and wind integrated microgrid systems. He also elaborated protection challenges associated with microgrids.



Day 4: 14th Feb. 2019

On the 4th day, Prof. S. V. Kulkarni, IIT Bombay, explained basics of electromagnetics and Finite Element Method (FEM). Applications of FEM for design, analysis and diagnostics of power system equipment were also elaborated through a few case studies. He further discussed

various monitoring and diagnostic techniques for transformers. Different approaches for modelling of transformers for diagnostics purpose were also enumerated.



Day 5: 15th Feb. 2019

First Session- Dr. Arghya Mitra, Assistant Professor, VNIT Nagpur, talked about grid integration with renewable sources, stability issues under varying wind speed conditions, and scope of research in this area.



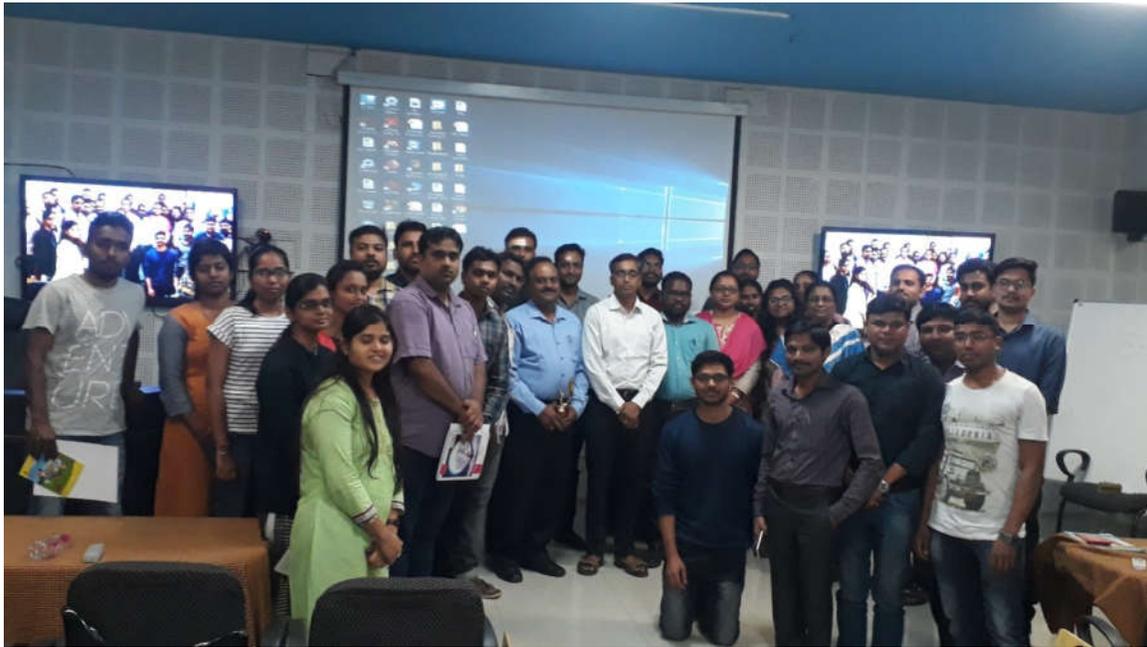
Second Session: Dr. Subhojit Ghosh, Associate Professor, NIT Raipur, elaborated various options available for energy storage systems in existing microgrid and challenges thereof. Applications of superconductors were also enumerated.

Day 6: 16th Feb. 2019

First Session: Prof. Zakir Rather, IIT Bombay talked about Grid integration of Renewable Energy (Wind and Solar PV) and grid operation under high penetration of Renewable Energy. He enlightened the audience by discussing current grid operational issues in various parts of the world and reasons behind them. The talk provided pointers toward new research areas for students and faculty members.



Second Session: Er. Girish Gupta, Superintendent Engineer (Project Execution & Management), CSPGCL, explained recent advancements in power industry. He discussed about power markets from renewable energy point of view, issues/ challenges facing power utilities, and highlighted need of industry-academic interactions.



Valedictory function:16th Feb. 2019

In the afternoon session, Valedictory Function was organized. Dr. Monalisa Biswal welcomed the Chief Guest of the function Er. Girish Gupta, Superintendent Engineer (Project Execution & Management), CSPGCL. Er. Girish Gupta and Dr. N. D. Londhe, Head of Electrical Engineering Department, NIT Raipur, appreciated the efforts for organizing the first IEEE Sponsored STTP. The participants gave oral feedback regarding the STTP. Training Completion Certificates were presented to the participants. Dr. M. Biswal and Dr. Ebha Koley presented vote of thanks. The coordinators appreciated the support given by IEEE Bombay Section and NIT Raipur for the success of this STTP.