Online

Faculty Development Programme on Power System Optimization & Control

Dec 14 – Dec 18, 2020

Organized by

Department of Electrical Engineering

Rajkiya Engineering College
Ambedkar Nagar

Sponsored By

Dr. A. P. J. Abdul Kalam Technical University, Lucknow

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Registration

Applicants have to register by filling the form by using link:
https://forms.gle/9CiYFwRA8jZE2Ygz9

on or before 30/11/2020

For Further Details, Contact:
+91-9012872877, +91-8470892739

Objective of the FDP

The power network undergoes a transition from a system with conventional generation power plants and inflexible loads to a system with a large number of distributed generations, renewable generations, energy storages, and flexible loads. This trend has imposed very significant challenges on the corresponding control design to achieve efficient operation and effective protection of the power grid.

The increase in load sizes and operational complexity such as generation allocation, non-utility generation planning, and pricing brought about by the widespread interconnection of transmission systems and inter-utility power transaction contracts, has introduced major difficulties into the operation of power system. However practically, the generating units have non-convex input-output characteristics due to prohibited operating zones, valve-point loadings and multi-fuel effects considered as heavy equality and inequality constraints, which cannot be directly solved by mathematical programming methods. Over the past decade, many prominent methods have been developed to solve these problems, such as the hierarchical numerical methods, tabu search, neural network approaches, genetic algorithm, evolutionary programming, swarm optimisation, differential evolution and hybrid search methods.

Centralized control strategies may become intractable for large-scale power systems, and is subject to technical issues such as poor scalability and low reliability. To overcome these limitations, it is desirable to develop distributed control strategies. Second, in a power network with a high penetration of DERs such as wind generators and solar panels, there

is high uncertainty of power generation. Thus, the uncertain and unpredictable features of DERs need to be taken into account to design a control strategy. Also, the communication network in the distribution network is still under-deployed and has limited capabilities.

The goal of this FDP is to bring together leading researchers to share their technical and scientific findings and visions, and new advanced control and optimization strategies with application to energy systems. It is designed to be accessible to a broad audience through online platform, and will be particularly useful for the audience interested in this domain.

Course Outline

Introduction to the subject

1. Power Systems
2. Different states of power systems
3. Security control
4. Power system optimization and its economic importance
   i. Power systems control
   ii. Relay control
   iii. Automatic emergency control
   iv. Generation and frequency control
5. Voltage stability and automatic voltage regulator
6. Stability of power systems
   i. Static stability
   ii. Dynamic Stability
7. Power systems optimization
8. Emergency state optimization
9. Economic dispatch problem
10. Unit commitment
11. Optimal power flow
12. Long-term optimization of power systems

About Dr. A. P. J. Abdul Kalam Technical University:

Dr. A.P.J. Abdul Kalam Technical University (AKTU) (formerly UPTU) was established by the Government of Uttar Pradesh.

The University is affiliating in nature and its jurisdiction spans the entire state of U.P. in affiliating B.Tech. M.B.A., M.C.A., B.Arch., B. Pharma., B.H.M.C.T., M.Tech. and Ph.D. programmes imparting graduate, postgraduate and doctoral level training in all government and private institutions located all over U.P. in engineering, technology, architecture, pharmacy, hotel management and catering technology as well as M.B.A. and M.C.A. programmes.

Rajkiya Engineering College, Ambedkar Nagar

Government of Uttar Pradesh established Rajkiya Engineering College (R.E.C.) Ambedkar Nagar in 2010. The college has started offering B.Tech. Programme in three disciplines – Civil Engineering (CE), Electrical Engineering (EE) and Information Technology (IT) with intake of 60 seats in each branches from the session 2010-11.

The students are extensively exposed to cross-cultural environment as candidates from various other States such as Jammu & Kashmir, Madhya Pradesh, and Rajasthan etc. join REC for various undergraduate programs. REC Ambedkar Nagar is fully residential institution with four hostels for boys and one for girls.

Department of Electrical Engineering:

The department of Electrical Engineering at Rajkiya Engineering College Ambedkar Nagar offers a vibrant environment for undergraduate education in Electrical Engineering Established in 2010. The Department of Electrical Engineering is actively engaged in teaching and research with modern laboratories and excellent faculty members.

The under graduate programme provides the students with a strong background in the broad areas of Electrical Engineering namely control system, power electronics & drives, electrical machines, power system and renewable energy. A strong exposure to state-of-the-art technologies is further provided through elective courses that are carefully designed for the interested students.

Presently, the Department comprises of 09 Faculty members and also sufficient number of nonteaching staff. The Dept. has also state-of-the-art facilities like the Computer Lab, Electrical Workshop, and Seminar Hall etc. The Faculty has a team of well-qualified and experienced teaching staff. Six of them are Ph. Ds. & rests are M.Tech. from eminent institutes like IITs, NITs and Central universities. They have published large number of research papers in various journals & conferences of repute. The Faculty is equipped for meeting the challenges of the present and the need of the future.