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Power System Flexible Operation

System modelling platform



Presented online and at UCT in 2025



UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD



Introduction



Power systems require a degree of flexibility to always balance supply and demand. Traditionally power systems were dominated by dispatchable fossil fuelled power plants. Therefore, system operators and energy planners ensured that the energy mix could cater for the required demand profile.

Adoption of intermittent renewable energy sources increases uncertainty as the system flexibility would need to account for fluctuation in supply.

The challenges related to flexible operation are exacerbated during the energy transition. Traditional

base load power plants are shifted towards mid-merit operating modes and funding is required for flexible generation sources.

The objective of this course is to provide participants with an understanding of the considerations for optimising power systems. The content provides an understanding of the interaction between different energy generation sources, how these systems are set up and the market structure to sustainably support flexibly in the power system.

Course Content

Participants are given an overview of system flexibility resources covering the type of power generation plants available and their contribution to the power system. The content covers traditional generation technologies and introduces participants to novel flexibility resources such as demand side management and virtual power plants. Given an understanding of the context, participants will then build models to study flexibility and use these models to estimate the cost implications of flexible systems. Using these models, the course will cover the requirements for markets to support flexibility; the role of the distribution system operator to encourage customer flexibility; and sector coupling to from a flexibility perspective.

Modules in this course will:

- Outline the technical and operational challenges with flexible operation of power generation assets
- Identify the factors plant engineers need to consider for flexibility
- Quantify the impact of flexible operations on emissions
- Identify methods for production planning for flexible operations
- Consider resource specific details for a range of generation and storage options.

Course Facilitator



Dr Graeme Chown is a power systems control and operations specialist with over 30 years' experience in the electricity industry. He has extensive experience in power system operations, generation scheduling and dispatch, interconnected operations, electricity markets, electricity regulation, ancillary services, energy storage, transmission pricing, power system studies and power system modelling, and power station control.

Course Overview

Name	Power System Flexible Operation
Duration	To be presented in 2025
Venue	To be confirmed
Course Fee	To be confirmed
Participants	Suitable for managers, engineers, students, and academics with a background in the technology aspects related to the energy sector.
Format	The course will be delivered as a face-to-face course in a venue at the University of Cape Town, as well as online. Provisions have been made to ensure participant safety with sanitation and physical distancing.

Certificates and CPD points

- Participants who attend 80% of the sessions will receive a Certificate of Attendance.
- Participants who attend the course and complete all assignments and the exam will receive a Certificate of Completion. These certificates contribute to the Power System Planning and Operations Training programme offered by Stellenbosch University.
- Both certificates carry a weight of 4 CPD points.

Registration

Registration and Cancellation

- Registration currently closed.
- Registration covers attendance of all sessions of the course and course material.
- Registrations close one week before the start of the course. Confirmation of acceptance will be sent on receipt of a registration form.
- **Cancellations must be received one week before the start of a course, or the full course fee will be charged.**
- For more information on application and registration procedures, please visit our website: www.cpd.uct.ac.za/cpd/applications

Contact details

For more information or details on CPD courses, visit our website or contact us.

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