

# Power System Data Analytics



CENTRE FOR RENEWABLE &  
SUSTAINABLE ENERGY STUDIES



Stellenbosch  
UNIVERSITY  
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UNIVERSITEIT

## DATE

27 - 31 May 2024

## VENUE

Engineering Faculty, Stellenbosch University

## ACCREDITATION

Certificate of attendance (4 CPD points)

[REGISTER HERE](#)

Certificate of competence (4 CPD points)

[REGISTER HERE](#)

15 academic credits at NQF 8 or 9 level

[READ MORE](#)

## DEADLINE

Certificate course registration closes 14 calendar days before the course starts.

The number of attendees is limited. Bookings will be taken on a first come, first served basis. For academic module registration deadlines, please contact the relevant academic programme coordinator.



## PRESENTER AND COORDINATOR

**Prof Jacomine Grobler** is a member of the Department of Industrial Engineering (IE) at Stellenbosch University. She specializes in optimisation algorithm development and data science. She spent seven years in industry before completing her PhD in 2015. She has since received a number of rewards including the 2017 South African Institute for IE Most Outstanding Young Industrial Engineering Researcher Award and regularly reviews papers for leading international journals.



## PRESENTER

**Dr Amaris Dalton** is a consultant with FORRS Partners based in Germany, advising energy traders, utilities and transmission system operators on topics relating to energy markets, data management, and process automation. Previously, Dr Dalton worked as a postdoctoral research fellow at Stellenbosch University, focused on energy-meteorology and issues associated with the integration of variable renewable energy into power systems. His publication record includes topics such as wind power prediction, wind power variability assessments and power system modelling.

## OTHER PRESENTERS

**Dr Armand du Plessis** (Stellenbosch University)

**Mr Eldon Burger** (Stellenbosch University)



## Synopsis

An introduction to the data analytics life cycle, and how to apply each phase of this life cycle to solve power system data analytics problems, with specific reference to short-term forecasting of demand and renewable energy production.

Students will learn techniques for exploratory data analysis, and how to apply machine learning approaches for mining knowledge from data sets, to extract hidden patterns, associations and correlations from data. Students will gain the practical know-how needed to apply data analytics techniques to structured data. The advanced data analytics techniques encountered will be applied to data intensive engineering problems from the power systems domain.

As part of the modelling and evaluation phases of the data life cycle the following short-term demand and VRE production forecasting aspects will be covered in more detail:

- Introduction to power system operation - the need for forecasting
- Numerical Weather Prediction (NWP) models
- Weather processes and climate for South Africa
- Relationship between weather and load
- Relationship between weather and VRE production
- VRE energy conversion models
- Weather parameter measurement (data aspect)
- Short-term load forecasting
- Application of machine learning and big data techniques to short term VRE production forecasting

## Qualification and accreditation

The module is accredited for a variety of outcomes, depending on what the attendee registers for. Module contact time (40 hours) are shared by all attendees, but additional assessments, assignments, and projects will be specific to the outcome that the attendee registered for.

- The module is accredited for ECSA Continuous Professional Development (CPD) credits, and attendees can obtain a certificate of attendance (if all lectures have been attended) or competence (if all lectures have been attended and various assessments have been successfully passed).
- Unless otherwise stated, the module is also accredited for 15 academic credits at both NQF8 level (Post-graduate diploma) and NQF9 level (Masters), as part of various [academic programmes](#). This requires a total time investment of 150 hours.

## Delivery Model

- The module will be delivered over five days. Pre- and post-module assignments and projects are applicable depending on the outcome the attendee registered for.
- **Certificate of competence and academic attendees are required to attend the full module in person.** Certificate of attendance attendees have the option of attending the module in person, online only, or a mixture of these.

## Who should attend

Engineers, technologists and technicians active in the energy sector. Government and local authority officials. Managers, planners and developers. Investors. Academic students.

## Travel and Accommodation

All travel and accommodation arrangements are the attendee's own responsibility.

## Prerequisites

**Certificate of attendance:** none

**Certificate of competence / Post-graduate diploma at NQF8:** NQF7 engineering qualification

**Masters at NQF9:** NQF8 engineering qualification

**IT infrastructure:** For online attendees, adequate internet connectivity to connect reliably via Teams for the duration of the module. For Certificate of competence, Diploma and Masters attendees, a computer capable of running Windows 10 with user rights to install new software.

## Module Fees

- The standard fee for the five-day module is **R13 500 for a certificate of attendance**, and **R15 800 for a certificate of competence**. Please refer to the University's latest study cost information for academic fees.
- From time to time funding is sourced to subsidise module fees for specific modules for attendees from specific areas of industry. Please refer to CRSES's short courses website for the latest information.
- Cancellations made up to 21 days before the module starts will be subject to a 15% handling fee. No refunds will be made after this date; however, substitutions will be accepted.
- Payment is mandatory for attendance.
- In the case of unforeseen circumstances, Stellenbosch University reserves the right to cancel the module or change the presenter/s, in which case all fees will be reimbursed in full on request.

## Contact

+27 (0) 21 808 4069

[crses@sun.ac.za](mailto:crses@sun.ac.za)

[www.crses.sun.ac.za](http://www.crses.sun.ac.za)