



CENTRE FOR RENEWABLE &  
SUSTAINABLE ENERGY STUDIES

# Power System Analysis

**DATE** 1 – 7 Dec 2021

**VENUE** To be confirmed

**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** 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.



## PRESENTER

**Prof John van Coller** has been with the University of the Witwatersrand for the past 40 years where he is currently an Associate Professor. He teaches in the areas of insulation coordination, power system economics, power electronics and power systems. Throughout his career he has been involved in a large number of projects in the above areas for Eskom and industry.





## Synopsis

The fundamentals, models and applications of power system load flow, short-circuit analysis, stability and control. The topics covered include:

### Load flow analysis

- Applications of load flow calculations (component rating, loss assessment, operational studies, etc.)
- Models of the main components (power plants, loads, lines, transformers, reactive compensation equipment)
- Load flow algorithms (Newton-Raphson, current iteration etc.)
- Interpretation of load flow results

### Short-circuit analysis

- Applications of short circuit calculations (component rating, protection selectivity etc.)
- Fundamentals of short circuit calculations (e.g. relevant short-circuit indices, superposition principle, equivalent voltage source approach etc.)
- Models of main components (synchronous generators, renewable generators, lines, transformers, etc.)
- International short-circuit standards (e.g. IEC60909, ANCI C37, G74)
- Interpretation of short-circuit results

### Stability and control

- Within a applications-focused framework, fundamentals of power system stability and control
- Basic concepts of stability: freq, transient, voltage
- Models to demonstrate differences in resulting accuracy
- Outlook on dynamic modelling

## 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).
- 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.
- A blended classroom/online model will be followed, with students being offered the options to attend in person (covid dependent), online only, or a mixture of these.

## Who should attend

Engineers, technologists and technicians active in the energy sector. Government and local authority officials. Architects, 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:
- **R12 000 for a certificate of attendance**, and
- **R14 000 for a certificate of competence**. Please refer to the University's latest study cost information for academic fees.
- Attendees from Eskom, municipalities, government, academia and industry that are actively involved in some aspect of the South African power system may apply for a **50% CPD fee reduction**.
- 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)