# Smart Grid Communication

CENTRE FOR RENEWABLE & SUSTAINABLE ENERGY STUDIES

Stellenbosch UNIVERSITY IYUNIVESITHI UNIVERSITEIT

**DATE** 18 - 22 August 2025

**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.

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## PRESENTER

**Prof Riaan Wolhuter** is a member of the Electrical and Electronic Engineering Department at Stellenbosch University. His research interests include telecommunications, radio communications systems design, network topologies and communication protocols.

## Synopsis

This course will cover the fundamentals of communications, before proceeding to the various techniques of transferring data from A to B. Concepts such as bandwidth, network capacity, performance metrics, data integrity, and communications media will be covered. Subsequently the different communications technologies, both wireless and cable based, will be introduced, followed by their characteristics and application areas. Smart Grid networks and their specific requirements will be a focus area. The course will cover:

- What is information
- Data transmission media intro, i.e. Cu cable, radio, optical
- Waves, Spectrum and Units
- Information Transfer
- Modulation and demodulation fundamentals
- Noise and SNR
- Antennas, quick and simple
- Digital Transmission, i.e. ASK, FSK, PSK, Spread Spectrum
- Data Transfer
- Radio: Technology overview: VHF, UHF, Microwave, Microwave links, GSM / GPRS, 3G / LTE, WiFi: 802.11 a/b/g/n/ac, Internet of Things (IoT)
- Data Networking Basics, Switches & Routers, Network topologies, Protocols overview
- Smart Grid Specific Technology: Industrial interfaces & protocols, Switchgear / electrical control interfaces, Network performance, Performance criteria for distributed SG comms, Data transfer integrity, Wide area network types and principles, Telemetry for SG,
- Rural network options

## 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 or equivalent
**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 **R14 200 for a certificate of attendance**, and **R19 100 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.


**Short courses:**

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**Academic:**

Please contact the relevant academic department, quoting course code 13807 774/874