

# Solar Thermal Energy Systems



CENTRE FOR RENEWABLE &  
SUSTAINABLE ENERGY STUDIES



Stellenbosch  
UNIVERSITY  
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UNIVERSITEIT

## DATE

31 March – 4 April 2025

## VENUE

Engineering Faculty, Stellenbosch University

## ACCREDITATION

Certificate of attendance (4 CPD points)

[REGISTER HERE](#)

Certificate of completion (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 Craig McGregor** is an Associate Professor at Stellenbosch University in the Department of Mechanical and Mechatronic Engineering. He is a published author and spent 20 years in the energy industry before joining the university. He has received several awards, including the Bill Neal-May Gold Medal from the SA Institute of Chemical Engineering for outstanding achievement in process technology.





## Synopsis

This module deals with the collection of solar radiation and its conversion to heat that can be either used for industrial purposes or to drive a turbine to generate electricity. Low temperature and high temperature solar thermal technologies are covered, along with the concentrating optics systems necessary to generate high temperature, and thermal energy storage. The module culminates in the simulation and design of feasible solar thermal systems.

The main elements of the course are listed below:

- Solar radiation and the measurement of solar resources
- Thermodynamics, heat transfer and fluid mechanics as applicable to solar thermal
- Basic principles of solar radiation optics
- Principles of thermal energy storage and Carnot batteries
- Applications of solar thermal for domestic hot water, process heating and electricity generation
- Parabolic trough, linear Fresnel and power tower (central receiver) CSP systems
- Design of solar thermal energy conversion systems
- Operating strategies and economics of CSP systems

## 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:

+27 (0) 21 808 4069  
[keziah@sun.ac.za](mailto:keziah@sun.ac.za)  
[www.crses.sun.ac.za](http://www.crses.sun.ac.za)

### Academic:

Please contact the relevant academic department, quoting course code 11295 714/814