



# Hydro and Ocean Energy

CENTRE FOR RENEWABLE &  
SUSTAINABLE ENERGY STUDIES

**Date:** 2 - 6 August 2021

**Venue:** Mechanical Engineering, Faculty of Engineering,  
Stellenbosch University, Stellenbosch

**Registration:** [Link to be confirmed](#)

**Course fees:** R11 800

## Presenters:



**Prof. Theodor von Backström holds PhD and DEng degrees** (Stellenbosch). He taught Fluid Dynamics and Turbomachinery at Stellenbosch University. He currently teaches Hydro Energy, and supervises graduate students in fluid machinery and renewable energy systems. He is rated by the National Research Foundation as a researcher with considerable international recognition.



**Dr James R Joubert** is a qualified civil engineer with a MSc in Coastal Engineering and PhD in Mechanical Engineering. His postgraduate studies focused on ocean wave energy conversion, resource mapping on the South African coast and the design of a novel wave energy converter. He has done various consultation projects for device inventors and companies such as De Beers Marine and Eskom. He also has a keen interest in sustainable building and worked as project manager for a developer of a green residential estate.

## Synopsis

Ocean and hydro power can make a significant contribution to the generation of renewable electricity. In this introductory course both ocean and hydro energy associated with the elevation or movement of water will be studied, giving students a basic overview of the relevant resources, conversion technologies, project development and implementation, and the associated environmental and economic impacts.

## Hydro Energy

The course deals with the aspects listed here: Environmental, social and economic impacts and the Hydrological Impact Assessment Protocol. World and South African hydrological resource magnitude. Existing hydro installations in the world and in Africa. Types of hydro power plants and turbines. Turbine selection criteria: specific speed and specific power parameters. Turbine efficiency. Hydraulic design, hydraulic losses, pipe friction and other losses. Multiple turbine units. Basic operational constraints. Costing. Cost of hydro power. Micro hydro power systems. Technology developments. Future scenarios.

## Ocean Energy

It is possible to extract energy from ocean waves, currents, tides, salinity- and temperature gradients and use it to generate electricity. In this course the different ocean energy resources

will be studied as well as the conversion technologies applicable to each. In addition aspects such as resource measurement and assessment, technology readiness, environmental concerns and the economics of ocean energy projects will be addressed, with particular emphasis on the available resource along the South African coast.

## Who should attend

Engineers, technologists and technicians active in the energy sector. Architects, planners and developers. Government and local authority officials. Environmental Investors.

## Certification and Accreditation

The module has been registered with the Engineering Council of South Africa for 4 Continuous Professional Development points. A Certificate of Attendance will be awarded to all participants [who attend the full course.](#)

## Venue and Time

This course will be presented at the Faculty of Engineering, Stellenbosch and will run Monday to Friday, 2 - 6 August 2021. Directions can be obtained from [crses@sun.ac.za](mailto:crses@sun.ac.za) or <http://crses.sun.ac.za/contact-us>.

## Travel and Accommodation

Accommodation and travel are for your own account.

The Stellenbosch Information Bureau can be contacted at tel. 021-883 3584 for delegates who want to make their own accommodation arrangements. A list of available accommodation can also be obtained from [crses@sun.ac.za](mailto:crses@sun.ac.za)

## Registration

The course is designed for a restricted number of attendees so as to personalize and maximize the learning experience. Bookings will be taken on a first come first served basis.

**Registration close: 20 July 2020**

## Course Fees

- Cancellations made up to and including 14 July 2021 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 course or change the lecturer, in which case all fees will be reimbursed in full, on request.
- The course fee includes all study material, tea/coffee, and lunch.

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