



CENTRE FOR RENEWABLE &  
SUSTAINABLE ENERGY STUDIES



Stellenbosch  
UNIVERSITY  
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## POST-GRADUATE PROGRAMMES AND SHORT COURSES

in Renewable Energy and Green Hydrogen

Faculty of Engineering,  
Stellenbosch University



science & innovation  
Department:  
Science and Innovation  
REPUBLIC OF SOUTH AFRICA



german  
cooperation  
DEUTSCHE ZUSAMMENARBEIT

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**giz**  
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**sonedi**  
South African National Energy  
Development Institute

Renewable energy and green hydrogen will play a significant role in South Africa's future. Engineers, managers, and regulators will therefore need to understand both the underlying technologies, and how to plan and operate systems where these technologies are utilised.

Stellenbosch University is addressing this need through a range of postgraduate programmes structured around week-long course modules with assignments and projects that can be executed mostly off-campus, thereby broadening the audience to include part-time students.

Individual modules within these programmes can also be attended as stand-alone Continuing Professional Development (CPD) short courses. These short courses allow members of industry to increase their knowledge of specific subjects without the time commitment required for enrolling in a post-graduate programme. The courses are hosted at Stellenbosch University or at one of our partner universities.

Qualification obtained	Post-graduate Diploma in Engineering	Master of Engineering (MEng) Structured	Certificate of Attendance or Competence
Programme structure	8 week-long modules (15 credits each) at NQF8 level	8 week-long modules (15 credits each) at NQF9 level, research project (60 credits)	All modules are also offered as short courses
Minimum entry requirements	B.Tech or B.Sc (minimum 60% final year), B.Eng	B.Eng (minimum 60% final year), PG Diploma / B.Sc. Honours (minimum 65% final year)	Relevant technical training and/or industry experience



Overview		
Smart Grid Technology Overview	SU	Introduction to the key concepts of the Smart Grid, including information and communication technologies and their application and integration
Power System Analysis	WITS	The fundamentals, models and applications of power system load flow, short-circuit analysis, stability and control
Hydrogen in the Energy System	SU	A systemic view of energy systems with a specific focus on hydrogen
Technology		
Advanced Photovoltaic Systems	SU	Fundamentals, financial modelling, technical design, installation and maintenance of PV systems
Wind Energy	SU	Fundamentals, resource and feasibility modelling, technical design, project development and grid-integration of Wind Energy systems
Energy Storage Systems	SU	Fundamentals, applications, technologies, modelling and design, and economics of Energy Storage systems
Solar Thermal Energy Systems	SU	Fundamentals of solar thermal energy systems, specifically CSP, including concentrator principles and thermal storage applications
Smart Grid Communications	SU	Communications fundamentals, applications and technologies within the context of the power system
Bioenergy	SU	The practical and commercial application of various technologies for biomass conversion into bio-energy, ranging from bio-fuels to electricity
Hydro and Ocean Energy	SU	Ocean and hydro energy associated with the elevation or movement of water, including resources, conversion technologies, and implementation
Renewable Energy Systems	SU	The scientific, engineering, resource and integration aspects of various types of renewable energy systems at introductory level
Green Hydrogen Technology	SU	The available and developing technologies used for green hydrogen production, distribution, storage and end-use
Integration		
Power System Data Analytics	SU	The data analytics life cycle applied to solve power system problems, with special focus on demand and renewable energy short-term forecasting
Long-term Power System Planning	SU	The principles and techniques informing optimised long-term generation capacity planning, and transmission expansion planning
Distribution Customer Concepts	SU	Understanding the concepts inherent in the end use of electricity, including load modelling, pricing, technologies, and mini- and microgrids
Distribution Network Planning & Operations	NWU	Distribution network technical planning fundamentals, codes and regulations, and applications, and protection and technical operations
Power System Operations	SU	The fundamentals of power system operations in a future with high shares of VRE, and the processes and technologies that support such operations
Power System Flexible Operations	UCT	Operational power system flexibility optimisation where technical systems and electricity markets interact, and flexibly operating power plants
Green Hydrogen Project Engineering	SU	A course focussed on the principles of designing, funding and successfully implementing fit-for-purpose projects based on green hydrogen