



RENEWABLE ENERGY SHORT COURSES

In conjunction with



NELSON MANDELA
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The abundance of Renewable Energy sources in South Africa, coupled with skyrocketing energy prices has created an awakening giant in the form of small scale Renewable Energy harvesting. Many of these new technologies are becoming financially viable options for many businesses and private individuals.

The Nelson Mandela University in conjunction with the Centre for Renewable and Sustainable Energy Studies at Stellenbosch University have assembled a suite of short courses to educate individuals in the field of Renewable Energy.

Each course is offered intensively over a 5 day period and is accredited by the Engineering Council of South Africa (ECSA) for Continuous Professional Development points.

The four courses to be offered at Nelson Mandela University in 2017:

1. Renewable Energy Technology (23 - 27 October 2017– R5 500 p)

- The course will provide the participants with an overview of the most significant renewable energy resources, concepts, technologies and challenges to overcome climate change and other sustainable development goals.
- It will provide course participants with an insight into the possible solutions to sustainable energy usage.
- Participants will be able to understand the nature, resources, conversion technologies, efficiencies and practical utilisation of the following renewable energy sources:
 - Hydropower
 - Geothermal energy
 - Solar energy
 - Ocean current energy
 - Wave energy
 - Wind energy
- Participants will be able to propose sustainable *Energy Scenarios* using *Renewable Energy* to reduce the use of *Fossil Fuels* and combat *Climate Change*.



2. Renewable Energy Finance and Policy (Date TBC)

- Participants will be able to understand the parameters that influence the financial aspects and project design of renewable energy initiatives in Africa.
- The participant will be familiar with a range of instruments, the financial structuring tools needed to attract investors, and how to use alternative financial sources, like carbon finance, outside of the commercial financial institutions to ensure the financial viability of renewable energy projects.
- The module therefore aims to empower professionals to incorporate appropriate financing into their decision-making pertaining to renewable energy projects. This includes:
 - The basic financial metrics such as IRR, NPV, DSCR and LCOE,
 - Understanding the economic justification and impact of renewable energy projects,
 - Understanding of which sustainability drivers have an effect on the renewable energy business,
 - Understanding what barriers exist to renewable energy project implementation from a financial perspective, and
- To understand the policy context of the sustainability of renewable energy, from the perspectives of policy-makers and other stakeholders.
- The module is subsequently designed to address the following questions:
 - What does sustainable renewable energy mean?
 - How can sustainable renewable energy projects be assessed, identified and prioritised?
 - How may appropriate renewable energy projects be managed as sustainable energy value chains in Africa?
 - What tools can be used to promote appropriate and sustainable renewable energy projects?



3. Wind Energy (09 - 13 October 2017- R5 500 pp)

- Brief history of wind energy, current state of the industry and industry drivers.
- Predominant wind turbine technologies, theory of operation, electro-mechanical and aerodynamic principles.
- Fundamentals of electrical power quality and grid integration.
- Wind energy facility development process and methodologies, including wind resource assessment.
- Feasibility factors such as energy capture calculation, environmental impact assessment, grid studies and essential economics.

4. Photovoltaic Technologies (Date TBC)

- It will provide attendees with the understanding and tools to design grid-tied photovoltaic (PV) systems within the South African solar resource, technical and legislative contexts.
- The underlying design criteria will be to optimise the energy yield versus lifecycle costs of the PV system within the given resource, technical and legislative constraints, i.e. the optimising of the financial viability of the system.
- Specifically, the following topics will be covered:
 - Solar resource & irradiation data sources
 - How the photovoltaic cell converts irradiation to energy
 - Photo-voltaic panel: electrical characteristics, maximum power point, influence of shading & diffuse irradiation, etc.
 - Photo-voltaic array: impact of positioning & tracking, string design and DC cable sizing, etc.
 - Connection to the distribution grid: power electronics basics, earthing and circuit-breaker design, system sizing, AC cable sizing, South African regulations & standards, etc.
 - Financial viability: understanding tariffs, payback, etc.



Contact details

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