



CERTIFICATE COURSE IN

SOLAR AND WIND ENERGY TECHNOLOGIES

6 MODULES OVER 3 MONTHS

COMMENCEMENT DATE: 22 June 2010

Gain valuable expertise in two fast growing industries

Take advantage of new solar and wind technologies

Protect your planet and reduce your carbon footprint

WHAT YOU WILL GAIN FROM THIS COURSE

- Fundamental knowledge of wind and photovoltaic (PV) energy technologies
- Practical steps in designing, installing and commissioning PV and wind systems
- Clear and unbiased know-how about the pros and cons of both technologies
- The ability to compare both technologies
- Understanding of challenges in deploying these technologies
- Ability to perform financial viability assessments
- Understanding of the key climate change laws relating to these technologies

Presented by

Martin Arciga

BSc [Electrical Engineering]

ENROL NOW: Fax the enrolment form to us,
or email enquiries@eit.edu.au

BENEFITS OF E-LEARNING

- Upgrade your skills and refresh your knowledge without having to take valuable time away from work
- Receive information and materials in small, easy to digest sections
- Learn while you travel - all you need is an Internet connection
- Have constant support from your course instructor and coordinator for the duration of the course
- Interact and network with participants from around the globe and gain valuable insight into international practice
- Receive a certificate of completion for CPD purposes

PRESENTATION FORMAT

The certificate program is conducted by E-Learning, and features real-world applications using a multi-pronged approach involving self-study, interactive on-line webinars and homework assignments with a mentor on call.

The course consists of 6 modules over a period of 3 months. All modules involve a practical component or group activity. For each module there will be an initial reading assignment along with course work or problems to be handed in. Participants will have ongoing support from their instructor via phone, fax and e-mail. Course reading material will be delivered in electronic (PDF) format in advance of on-line presentations.

Presentations and group discussions will be conducted using a live interactive software system. Assignments will be submitted via e-mail. You will receive 4 technical manuals in hard copy upon completion.

Practical examples from actual projects will be used extensively to illustrate the principles and drive home the point.

LIVE WEBINARS

During the program you will participate in 6 live interactive sessions with the instructor and other participants from around the world.

Each webinar will be scheduled at 2 varying times, so you can select one that is most convenient for you. All you need to participate is an adequate Internet connection and a headset with a microphone.

During the live webinars you will have the opportunity to learn and discuss the techniques and procedures used in the design and engineering of complex process plants and piping systems.

The software package and setup details will be sent to you prior to the course. Session times to be confirmed upon registration.

PRESENTED BY

MARTIN ARCIGA BSc (Electrical Engineering)

Martin has over 20 years experience in Electrical Engineering. He has worked with PLCs, variable speed drives and on power quality in electrical plants. As a result of his expertise in these areas he has authored a range of popular, technical books. Martin has consulted and trained professionals in companies such as Siemens, GE, Mitsubishi, Omron and Schneider Electric, in countries including; France, Canada, and in parts of South America.

Throughout his career, Martin has spent time training engineers and technicians around the world. Topics of instruction have included; control, monitoring and energy cost saving strategies in electrical facilities, electric control of motors, reactive power in electrical systems, programmable logic controllers, security in automated equipment and processes, planning and design of electric transport and microprocessor programming. He is a knowledgeable and enthusiastic trainer, who can easily switch between fluent English and Spanish.

6 MODULES OVER 3 MONTHS

COURSE OBJECTIVES:

In this course, you will learn about the developments taking place in the areas of solar and wind energy and also how these can be made economically viable while reducing the carbon footprint.

Over the past decade there has been a significant increase in applying wind and solar power technologies – ranging from the domestic to the corporate environment. There has also been a dramatic improvement in the efficiencies of these technologies and this has helped make the applications economical. However, there are still considerable challenges with power, from photovoltaic systems (solar cells) costing between US\$200 and US\$600 per MWh (and lower prices for fossil fuels unless carbon taxes are included).

The issue of how these energy systems can co-exist with the grid needs attention. The growth of capacities of wind energy sources is already posing new challenges to the grid operators and users alike, given that their output changes almost continuously. Modelling wind generators for system study and synchronised operation with the grid are areas that must be understood by engineers preparing for a career in these technology segments, as well as consultants, installers of these energy systems and the end users.

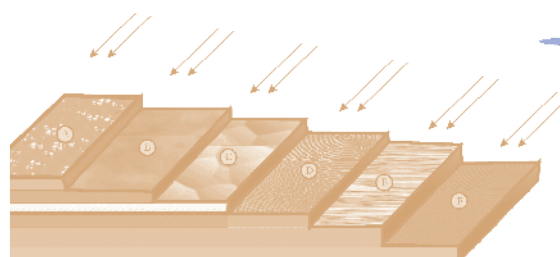
This course will provide you with the tools to design, install and commission simple photovoltaic and wind energy systems. This is not an advanced in-depth course but one covering the important issues enabling you to do simple designs and then to investigate the design and installation issues in more detail after the course either by further study or in conjunction with experts in the field.

It has been remarked that the annual growth rate of the solar and wind energy industry is 20% and even increasing beyond this in particular areas. In these challenging economic times, this is thus a good industry in which to gain a strong skillset.

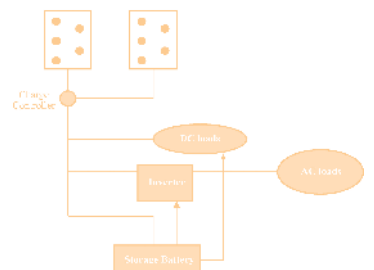
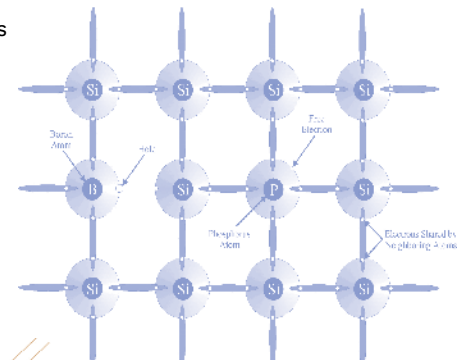
WHO SHOULD ATTEND:

This practical course would be suitable for any engineering professional who wants to gain know-how in these rapidly growing industries and enhance their careers. Typical participants would include:

- Mechanical, electrical and electronic engineers, technologists and technicians
- Instrumentation and control engineers and technicians
- Supervisors
- Electricians with a number of years experience
- Facility managers
- Energy specialists



- 1 Cover Glass
- 2 Antireflective Coating
- 3 Contact Grid
- 4 n-type silicon
- 5 p-type silicon
- 6 Back Contact



COURSE OUTLINE

MODULE 1: Introduction to Wind and Solar Energy sources

- World energy usage and mix of energy sources
- Pollution and global warming / climate change
- Fossil power and other non-renewable sources
- Renewable energy sources
- Is all renewable energy green?
- Non polluting renewable sources
- Energy security issues
- Electrical and mechanical engineering fundamentals

Practical Assignment

MODULE 2: Solar Power

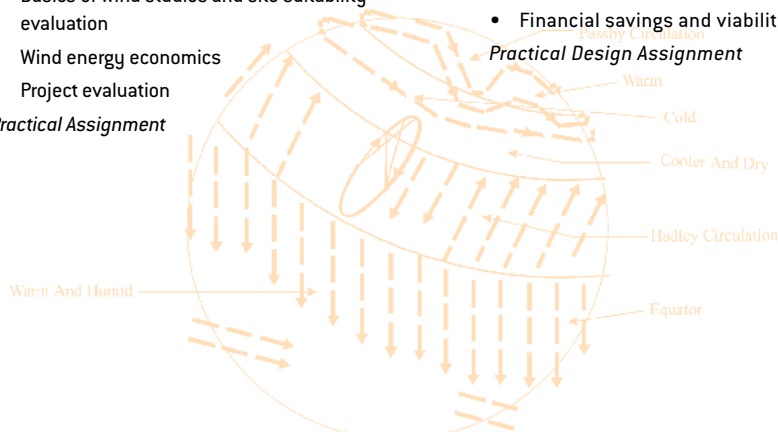
- Harnessing solar energy
- Applications
- Thermal energy from solar radiation
- Photovoltaics (PV) as an emerging alternative
- Basics of PV cells
- Modules and arrays
- Photovoltaic system components
- Modern trends
- Mechanical design
- Panel assembly and roof attachment methods
- Inverters
- Electrical system design
- Load profiles
- A typical PV installation
- Interconnecting solar power with the Utility Grid – challenges & opportunities

Practical Assignment

MODULE 3: Wind Power Basics

- Origins of wind energy
- Wind energy potential
- Technologies in wind power generation
- On-shore and off-shore installations
- Basics of wind studies and site suitability evaluation
- Wind energy economics
- Project evaluation

Practical Assignment



MODULE 4: Wind Energy Equipment (Mechanical)

- Wind turbine operating principles
- Types and ratings commonly available
- System design
- Dynamics and fatigue
- Wind turbine components
- Structures
- Aerodynamics and power control
- Troubleshooting
- Environmental issues (noise pollution and effect on fauna)

Practical Assignment

MODULE 5: Wind Energy Equipment (Electrical)

- Generators for wind turbines
- Electrical components
- Electrical installations of a typical wind farm
- Interconnection with electricity grid
- Fault ride through
- Modelling wind turbine generators for system study
- Grid connection
- Controls and simulation programs
- Typical power generation profile of a wind farm
- Lightning protection of wind turbines
- Troubleshooting

Practical Assignment

MODULE 6: Planning a green energy installation

- Study of power consumption of a facility
- Planning solar and wind power installation
- Energy storage issues
- Base load requirements and emergency power backup
- Technical issues
- Financial savings and viability

Practical Design Assignment

HARDWARE AND SOFTWARE REQUIREMENTS

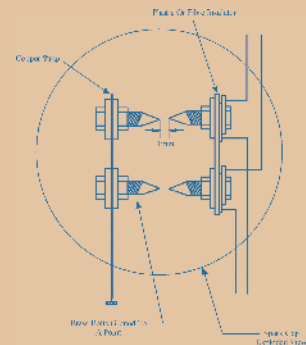
All you need to participate is an adequate Internet connection, PC, speakers and a microphone. The software package and setup details will be sent to you prior to the course.

ENTRANCE REQUIREMENTS

Some practical work experience in some of these topics would obviously be advantageous. A basic knowledge of electrical and mechanical principles is vital to maximise your benefits from this course. We can provide bridging training materials to get you up to speed if you feel you do not have the necessary knowledge.

PRACTICAL SESSIONS

You will undertake a series of practical assignments and software-based design sessions working together with the instructors and your colleagues on the course. This is to ensure that you maximise your understanding of the course materials and get maximum value from the course. Using the unique course presentation software, the instructor will go through the key issues with you in a live and highly interactive manner on your PC sharing his simulation software with you. This will ensure that you maximise your benefit from the course.



INCLUDES 4 FREE REFERENCE MANUALS VALUED AT OVER US\$400

(RECEIVED UPON COMPLETION)

- Practical Energy Efficiency, Design, Engineering and Auditing
- Wind and Solar Power - Renewable Energy Technologies
- Practical Programmable Logic Controllers (PLCs) for Automation and Process Control
- Fundamentals of Mechanical Engineering



CERTIFICATION

Participants completing all the assignments, and achieving 60% or more for their final mark, will receive the Engineering Institute of Technology Certificate in Solar and Wind Energy Technologies

