

CLEAN ENERGY MANAGEMENT COURSE MODULES

Recycling plastic bags and newspapers is just a tiny step to creating a more sustainable world. With challenges like global warming and rising carbon footprint, you can play a larger role in going green. If you have a heart for the environment and a head for science and engineering, the Diploma in Clean Energy Management [CEM] is perfect for you.

In CEM, you will be exposed to both the supply and demand side of clean energy and energy management. You will learn about the various sources of renewable and clean energy as well as the efficient and sustainable use of energy. With solar energy a key focus in CEM, you will get hands-on training at our Solar Technology Centre. Here, you will work on a solar PV power system to generate electricity. You may also be involved in the SolarNova Programme in your final year.

In your first year, you will acquire a firm foundation in electrical and electronic engineering and a good understanding of how clean energy will contribute to a more sustainable environment. In your second year, you will work on clean energy mini projects while continuing to hone your knowledge in engineering technology. You will also explore alternative sources of energy such as wind, hydro and fuel cell technologies. The course also covers modules such as Photovoltaic [PV] & Cell Fabrication Technology that teaches you to "grow" PV cells, install PV systems and measure cell efficiency.

In your final year, you get the chance to put your skills and knowledge into practice through a six-month internship, either locally or abroad. You can look forward to interning at reputable organisations such as Siloso Beach Resort, Marina Bay Sands, Renewable Energy Corporation [REC], Kamtex Solar, Narada Asia Pacific, HOB Centre of Building Research, Energetix, SMA RT@NUS, Sunseap, Xylem Water Solutions Singapore, Solar Energy Research Institute of Singapore [SERIS] and TOV SOD PSB.

LEVEL 3.1

Design and Operation of Photovoltaic Systems

This module aims to provide students with basic information needed to understand the principles of photovoltaic (PV) system operation, to identify appropriate PV applications in power systems and to undertake simple PV system design. Students will be introduced to the concept of PV stand-alone system, PV on-grid connected system, and the power condition issues associated with the two PV systems. At the end of the course, students should be able to design, setup, test, commission, maintain and troubleshoot photovoltaic systems.

Clean Energy System Integration and Protection

This module equips the students with the knowledge in the technical and economical concept of clean energy system integration. It covers basic fundamentals of power system. Furthermore, students will learn power flow and fault studies pertaining to distributed generation. In addition, case studies will be used to demonstrate the concept of clean energy system modelling, simulation, optimisation and sensitivity analysis for both stand-alone and grid-connected micro power system. Students will also learn the integration of photovoltaic and wind-turbine grid-connected systems.

Energy Audit and Measurement

The Energy Audit and Measurement module introduces students to the concept of energy audit and various measurements involved in a practical commercial energy audit. Students will explore energy conservation and improvements based on the energy audit measurements and are able to do a quantitative evaluation on the feasibility of implementing the recommended measures for a cost-effective solution for businesses.

Building Energy Studies

This module will train students in the field of energy studies using building modelling and simulation software which are increasingly being required by the industry when new buildings are designed or existing buildings are being retrofitted. Energy modelling will allow building owners and designers to better understand and predict the energy consumption patterns in their buildings before they are built and commissioned. Students will also learn the various parameters building designers have to consider including meeting the requirements from the local standards and codes.

Project ID - Connecting the Dots (IS Module)

This module aims to prepare students for an increasingly globalized and interconnected world where problems are multi-faceted and require interdisciplinary research and collaboration to solve. Using a project-based learning approach, students will have the opportunity to work in a multi-disciplinary team to investigate and propose comprehensive recommendations for a pressing real-world problem affecting Singapore. They will be guided to step out of their disciplinary silos and effectively communicate and collaborate with peers from different backgrounds. Ultimately, the module seeks to develop independent learning skills and the ability to synthesize diverse strands of knowledge to solve a complex problem, while impressing on students the importance of being a responsible global citizen.

LEVEL 3.2

Six-month Internship (Local/Overseas)

Students have the opportunity to apply the skills and knowledge acquired in the classroom in a real-life environment via on-the-job training. This programme allows students to hone skills in the areas of problem-solving, interpersonal communications, project planning and implementation, industrial liaisons and character building. Participating companies will have the opportunity to assess prospective employees and secure the services of these students in advance.

Project Design & Development

Students will work full-time on a group project and have the flexibility to choose from a wide range of topics related to system design and integration, research and development, computer applications or other engineering areas. Students are required to carry out research, design, implementation, testing and troubleshooting processes from a prototype to a final product or system under supervision. Students will also learn to apply project management and scheduling skills to enable them to complete their project in time. They will be required to document their project development process and present their projects at regular intervals.

COURSE CURRICULUM

Module Name	Credit Units
YEAR 3	
Level 3.1 (23 hours per week)	
Building Energy Studies	4
Clean Energy System Integration and Protection	5
Design & Operation of Photovoltaic Systems	5
Energy Audit and Measurement	5
Project ID: Connecting the Dots ^	4
Level 3.2 (22 hours per week)	
Six-month Internship (Local/Overseas)	22
or	
Project Design & Development	22

Notes:

^ For more details on Interdisciplinary Studies (IS) electives, please log on to www.np.edu.sg/is/

IS Modules

The School of Interdisciplinary Studies (IS) delivers a broad-based curriculum, which nurtures a new generation of professionals with multidisciplinary skills and an innovative and entrepreneurial spirit to meet the challenges of a knowledge economy. IS offers both prescribed modules and electives to challenge boundaries. Prescribed modules develop students' competencies in core areas such as Communication, Innovation and Enterprise, Culture

and Communication, and Personal Mastery and Development, while elective modules provide insights into Arts and Humanities, Business, Design, and Science and Technology.