

## **ELECTRICAL ENGINEERING COURSE MODULES**

As a highly versatile course, the Diploma in Electrical Engineering [EE] provides broad-based training in the areas of electricity & power systems, energy management and smart systems and specialised training in either the clean energy or power engineering domain.

In your first year, you will learn the fundamentals of electrical engineering with modules such as Electrical Engineering Fundamentals and AC Circuits as well as Programming and Analogue Electronics. In your second year, you will deepen your engineering knowledge and skills with modules such as PLC & Automation, Microcontroller & System, Electrical Installation Design and Energy Management Systems. In your final year, you will choose your specialisation in either Clean Energy Management or Power Engineering and put your knowledge and skills to practice in your six-month internship or final-year project.

The Clean Energy Management specialisation prepares graduates for the sustainable energy sector with a strong focus on energy management and clean energy technologies while the power engineering specialisation prepares graduates for exciting careers in diverse sectors such as the power & energy, land transport and marine & offshore as well as offers them a head start to practice licensed electrical work.

### **LEVEL 2.1**

#### **Electrical Machines**

This module covers the basic concepts and working principles behind common types of electrical machines such as motors, transformers and generators. The module also covers industrial applications of electrical machines and introduces the importance and various concepts of maintenance.

#### **Electric Circuit Analysis**

This module covers the analytical methods and techniques for analysing electrical systems, in particular three-phase electrical systems. Through the module, students will develop confidence to analyse and solve engineering problems in electrical systems.

#### **Microcontroller & System**

This module equips students with knowledge and practical skills to design and build microcontroller-based applications. The module covers the fundamental concepts of microcontrollers and the interfacing with external applications.

#### **PLC & Automation**

This module introduces students to PLC-based control systems where they will learn to design and build simple industrial control systems using relays and PLC programmes. The module also explores the concept of inter-connecting control systems to form networks.

#### **Integrated Real-world Project 3**

Integrated Real-world Project module aims to integrate the knowledge learnt in the semester and apply to a real-world project and further enhanced through relevant contextualisation. Students will work in teams. Upon completion of the module, students will be able to apply the skills and develop confidence in tackling projects.

## LEVEL 2.2

### Power Electronics

This module provides students with a broad-based understanding of power semiconductor devices and their applications in power conversion circuits. The module also covers basic principles of control and conversion of electrical power for industrial applications and introduces motor drive systems such as variable speed drives.

### Electrical Installation Design

This module equips students with practical skills to design electrical systems for residential, commercial and industrial installations according to statutory requirements. It covers estimation of load requirements and selection of protection devices, cables and circuit protective conductors.

### Energy Management Systems

This module covers the working principles and energy management of common electrical and mechanical systems in commercial and industrial enterprises. Students learn how to define energy conservation measures and assess the economic benefits of such measures. They also learn about practical issues in energy management such as improvement in energy utilisation of power distribution system.

### Project Management

This module provides students with an understanding of the various aspects of project management procedures. The module also equips students with various project management tools.

### Integrated Real-world Project 4

Integrated Real-world Project module aims to integrate the knowledge learnt in the semester and apply to a real-world project and further enhanced through relevant contextualisation. Students will work in teams. Upon completion of the module, students will be able to apply the skills and develop confidence in tackling projects.

### World Issues: A Singapore Perspective (IS Module)

This module takes a global approach to significant current and historical events. The aim is to enhance students' understanding of such events and issues in the context of Singapore, as well as challenge students to think critically about choices and decision-making vis-à-vis the nation state.

## COURSE CURRICULUM

Module Name	Credit Units
<b>YEAR 2</b>	
<b>Level 2.1 (18 hours per week)</b>	
Electrical Machines	4
Electric Circuit Analysis	4
Microcontroller & System	3
PLC & Automation	3

Integrated Real-world Project 3	4
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**Level 2.2 (20 hours per week)**

Power Electronics	3
Electrical Installation Design	4
Energy Management Systems	4
Project Management	3
Integrated Real-world Project 4	4
World Issues: A Singapore Perspective ^	2

**Notes:**

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