

# **Module Synopses**

## **Semester One**

### **1. Engineering Mathematics**

This module provides students with essential mathematical techniques for solving problems in electrical engineering. Emphasis is placed on numerical methods, practical applications and adaptability of computer usage. Topics covered include various transform methods, matrices, vector algebra and numerical methods of solving differential equations.

### **2. Dynamics & Control**

This module introduces the basic principles of automatic control and illustrates the application of these principles in modern control systems. Topics include mathematical models, dynamic analysis, stability analysis, frequency response analysis, s-plane analysis and compensation techniques.

### **3. Electrical Services Design**

This module aims to provide students with an in-depth understanding and design methodology of the various electrical building services. In particular, the module will cover the design, specifications and selection of electrical installation, lighting system, lightning protection system, and EIB system. Relevant Acts and Regulations governing the design of these various electrical services will also be discussed in detail in the module.

### **4. Power Distribution System in Buildings**

This module aims to provide students with working and in-depth knowledge on the planning, design and commissioning of high and low voltages (230V – 22kV) electrical installation and distribution systems in commercial, residential and industrial buildings. Relevant Acts and Regulations, Code of Practices and Standards together with the operation, selection and sizing of various system components such as standby generator, switchgear and transformer will also be included in this module.

## **Semester Two**

### **5. Electric Drives & Control**

This module aims to provide knowledge to students on the practical aspects of industrial drives. The topics cover DC Drives, AC Drives, Step Motor Drives and their applications, motor sizing, protection and drive system installation.

### **6. Programmable Logic Controller for Building Services**

This module aims to introduce to the students the basic concepts and the principles of programmable logic controller (PLC) related to industry and building automation applications.

It also covers the various programming and related sensor technologies for automation and the uses of programmable controllers in industry and building automation like pump control, compressor control, chiller control, lighting control and lift control.

#### 7. Air-Conditioning Systems Design & Operation

This module provides students with a working knowledge of the design principles and the operation of air-conditioning systems such as used in both, commercial and industrial buildings. Particular emphasis is placed on the operation and maintenance of such systems. Routine operation and maintenance procedures of such systems are also covered.

#### 8. Building Automation Systems

This module provides an integrated system approach to understand Building Automation Systems and their applications to building service where computerised control is a key technology implemented to ensure effective building operation. It covers the architecture equipment and zone level computer control in building automation, communication and networking with computer control systems, application software of modern building automation systems, & provides good working knowledge of how to specify, design, install, commission, operate and maintain a Building Automation System. Application areas will include air-conditioning systems, fire detection and alarm systems, security systems & other essential building services. The lectures will be complemented by hands-on training sessions in the Building Automation Application Centre.