COURSE OVERVIEW EE0870
Electrical Engineering for Non-Electrical Engineers

Course Title
Electrical Engineering for Non-Electrical Engineers

Course Date/Venue
June 29-July 03, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference
EE0870

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description

This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt in the class will be applied using our state-of-the-art simulators.

This course is designed to provide participants with a detailed and up-to-date knowledge on electrical engineering principles. It covers the electrical equipment, control circuits and instrumentation, electrical drawings and documentation in accordance with electrical standards; and the power generation and transmission line.

Further, the course will also discuss the importance and functions of substations such as substation equipment, transformers, regulators, circuit breakers, lightning arresters, reactors, etc.; the distribution methodology in distribution systems, transformer connections, fuses and cut outs, riser or dip pole and underground service; and power consumption and power system protection.

During this interactive course, participants will learn the interconnected power systems; the power system control centers and telecommunications; and the electrical safety and personal protection.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain a good working knowledge in electrical engineering principles
- Discuss electrical equipment, control circuits and instrumentation
- Employ electrical drawings and documentation in accordance with electrical standards
- Discuss power generation and transmission lines
- Recognize the importance and functions of substations such as substation equipment, transformers, regulators, circuit breakers, lightning arresters, reactors, etc
- Apply the distribution methodology in distribution systems, transformer connections, fuses and cutouts, riser or dip pole and underground service
- Implement power consumption and power system protection
- Discuss interconnected power systems as well as power system control centers and telecommunications
- Employ electrical safety and maintain personal protection

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course is intended for those who would like to gain a good understanding of the basic principles of electricity and the fundamentals of electrical engineering including plant engineers, mechanical engineers, process engineers, maintenance engineers, facilities managers, facility professionals and other technical staff. The course is ideal for electrical staff who do not have degree in electrical engineering including electrical supervisors, electrical foremen and electrical technicians.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Mr. Pan Marave, PE, MSc, BEng, is a **Senior Electrical & Instrumentation Engineer** with over **30 years** of extensive experience in **Oil**, **Gas**, **Petrochemical**, **Refinery** & **Power** industries. His expertise includes Basic **Electricity**, **Electrical Fault Analysis**, **Electrical & Special Hazards**, **Electrical Generator & Power Transformers**, **Electric Power Substation** & **Systems**, **Electrical Engineering Principles**, **Electrical Networks & Distribution Cables, Personnel Protection**, **Circuit Breaker**, **HV Switchgear Maintenance**, **HV/LV Electrical** Authorisation, **HV/LV Equipment**, **Motor Controllers**, **Electrical Switching** Practices, **Emergency Planning**, **Safety Management**, Safety Instrumented Systems (**SIS**), Safety Integrity Level (**SIL**), Emergency Shutdown (**ESD**), **DCS**, **SCADA** & **PLC**, **Measurement** (**Flow**, **Temperature**, **Pressure**), **Process Analyzers** & **Analytical Instrumentation**, **Process Control**, **Instrumentation** & **Safeguarding, Process Controller**, **Control Loop & Valve Tuning**, Industrial **Distribution Systems**, Industrial **Control & Control Systems**, **Power Generation & Transmission**, Power Systems **Protection & Relaying**, **Earthing**, **Power System Protective Relay**, **Bonding**, **Grounding**, **Lightning & Surge Protection**, **Motor Control Circuit**, **Circuit Breakers**, **Switchgears**, **Transformers**, **Hazardous Areas Classification** and **Detailed Engineering Drawings**, **Codes** & **Standards**. Furthermore, he is also well-versed in Microprocessors Structure, Lead Auditor (**ISO 9000:2000**), **ISO 9002**, Quality Assurance, and Projects & Contracts Management.

Presently, Mr. Marave is the **Technical Advisor** of **Chamber of Industry & Commerce** in Greece. Prior to this, he gained his thorough practical experience through several positions as the **Technical Instructor**, **Engineering Manager**, **Electronics & Instruments Head**, **Electrical**, **Electronics & Instruments Maintenance Superintendent**, **Assistant General Technical Manager** and **Engineering Supervisor** of various international companies such as the **Alumil** Mylonas, **Athens Papermill**, **Astropol** and the **Science Technical Education**.

Mr. Marave is a **Registered Professional Engineer** and has **Master's** and **Bachelor's** degrees in **Electrical Engineering** from the **Polytechnic Institute of New York** and **Pratt Institute of New York** (**USA**) respectively. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management** (**ILM**) and an active member of the **Technical Chamber** and the Institute of Electrical and Electronics Engineer (**IEEE**) in Greece. He has presented and delivered **numerous international** courses, conferences, trainings and workshops worldwide.

Course Fee

US$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1: Sunday, 29th of June 2025

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Electricity, AC and DC*** *Fundamentals of Electricity ● Electronics ● Standards ● Electrical Standards ● Power Distribution Systems*
0930 – 0945	*Break*
0945 – 1100	***Electrical Equipment and Instrumentation*** *Size of Power Distribution Systems, by Voltage ● Electrical Equipment and Instrumentation*
1100 – 1215	***Electrical Standards*** *Introduction to NEC and Outline ● Definitions, including Enclosure Ratings ● Conductor Sizes, AWG and Circular Mils ● Clearances and Working Space Requirements ● Load Configurations and Voltages ● Branch Circuit Ampacity Determination ● Overcurrent Protection*
1215 – 1230	*Break*
1230 – 1420	***Electrical Standards (cont'd)*** *Circuit Breaker and Fuse Types ● Importance of Coordinated OC Protection ● Grounding ● Conductor Insulation Rating ● Panel Boards ● Safety Systems*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day One*

Day 2: Monday, 30th of June 2025

0730 – 0930	***Electrical Drawings & Documentation*** *Review Power Single Line Drawing: XYZ-MCC1 ● Review Control Diagram MCC Drawing: XYZ-MCC2*
0930 – 0945	***Electrical Drawings and Documentation (cont'd)*** *Review PLC Elementary Diagram/Drawing: XYZ-123*
0945 – 1115	*Break*
1115 – 1230	***Power Generation*** *AC Voltage Generation ● The Three-Phase AC Generator ● Real-Time Generation ● Generator Connections ● Wye and Delta Stator Connections ● Power Plants and Prime Movers*
1230 – 1245	*Break*
1245 – 1420	***Transmission Lines*** *Transmission Lines ● Conductors ● Transmission Line Design Parameters ● Underground Transmission ● DC Transmission Systems*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

Day 3: Tuesday, 01st of July 2025

0730 – 0930	***Substations*** *Substation Equipment ● Transformers ● Regulators ● Circuit Breakers ● Reclosers ● Disconnect Switches ● Lightning Arresters*
0930 – 0945	*Break*
0945 – 1115	***Substations (cont'd)*** *Electrical Bus ● Capacitor Banks ● Reactors ● Static VAR Compensators ● Control Buildings ● Preventive Maintenance*
1115 – 1230	***Distribution*** *Distribution Systems ● Transformer Connections ● Fuses and Cutouts*
1230 – 1245	*Break*
1245 – 1420	***Distribution (cont'd)*** *Riser or Dip Pole ● Underground Service*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

Day 4: Wednesday, 02nd of July 2025

0730 – 0930	***Power Consumption*** *Electrical Energy Consumption ● Power System Efficiency ● Power Factor ● Supply and Demand ● Demand-Side Management ● Metering ● Performance-Based Rates ● Service-Entrance Equipment*
0930 – 0945	*Break*
0945 – 1115	***Power System Protection*** *Two Types of Protection ● System-Protection Equipment and Concepts ● Distribution Protection ● Transmission Protection*
1115 – 1230	***Power System Protection (cont'd)*** *Substation Protection ● Generator Protection ● Generator Synchronization ● Overall Transmission Protection*
1230 – 1245	*Break*
1245 – 1420	***Interconnected Power Systems*** *Interconnected Power Systems ● The North American Power Grids ● Regulatory Environment ● Interchange Scheduling*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Four*

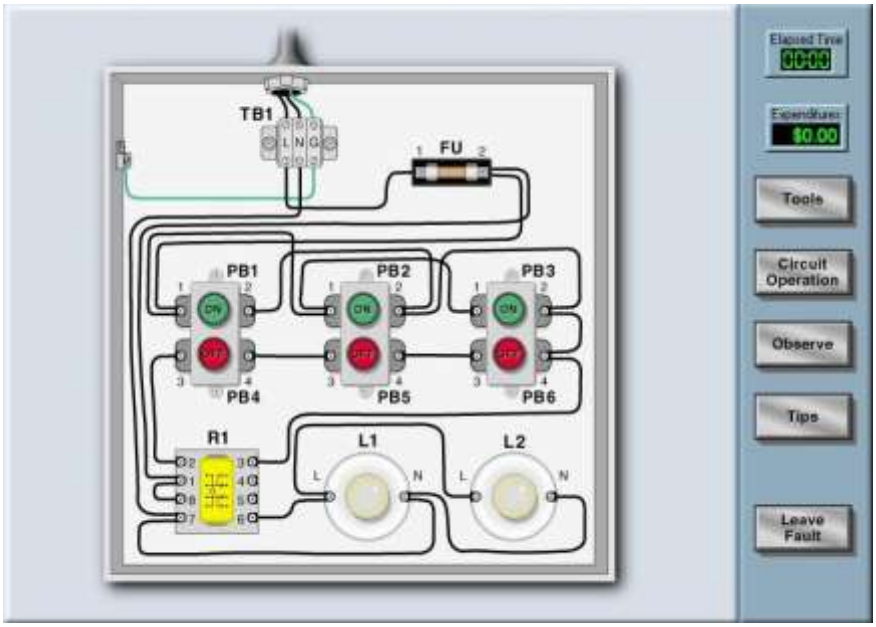
Day 5: Thursday, 03rd of July 2025

0730 – 0900	***Interconnected Power Systems (cont'd)*** *Interconnected System Operations ● System Demand and Generator Loading ● Reliable Grid Operations*
0900 – 0915	*Break*
0915 – 1045	***Power System Control Centers & Telecommunications*** *Electric System Control Centers ● Supervisory Control and Data Acquisition (SCADA)*

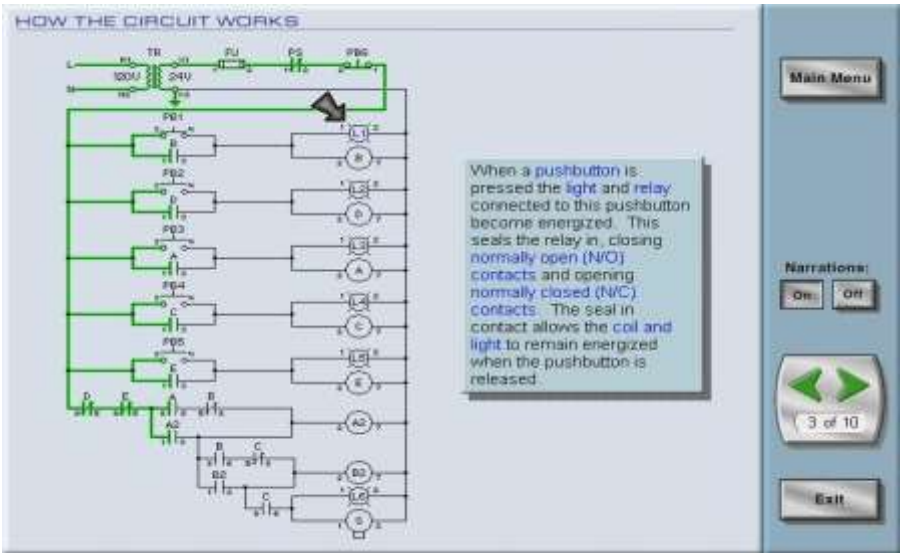
1045 – 1215	***Power System Control Centers & Telecommunications (cont'd)*** *Energy Management Systems ● Telecommunications*
1215 – 1230	*Break*
1230 – 1345	***Electrical Safety*** *Electrical Safety ● Personal Protection*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulator (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using our state-of-the-art "Haward Troubleshooting" simulators.



Basic Techniques



Basic Control Circuits

Motor Control Techniques

Course Coordinator

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