



COURSE OVERVIEW EE0487 Electrical Engineering 2

Course Title

Electrical Engineering 2

Course Date/Venue

October 13-17, 2024/Musandam Meeting Room,
Royal Tulip Muscat, Oman

Course Reference

EE0487

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs



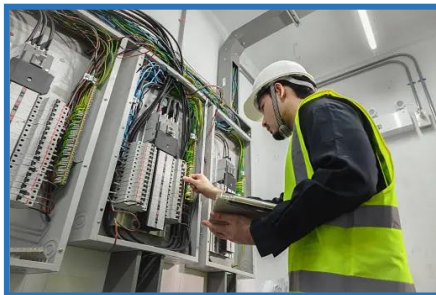
Course Description



This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.



This course is designed to provide participants with a detailed and up-to-date overview of Electrical Engineering II. It covers the basic circuit analysis; the Ohm's law and Kirchhoff's law; the basics and applications of Laplace transforms in circuit analysis; the AC circuits in the frequency domain in phasor analysis; the transfer function, two-port networks and digital electronic; the Boolean algebra and sequential logic circuits; the basics and differences of microcontrollers and microprocessors; the memory devices covering RAM, ROM and EEPROM; and the basics of power systems comprising of generation, transmission and distribution.



During this interactive course, participants will learn the working principle, types and applications of transformers; the synchronous machines, power system protection and power factor and its correction; the open loop versus closed loop control systems; the time domain analysis and frequency domain analysis; the stability of control systems, PID controllers and electromagnetic compatibility (EMC); the renewable energy systems the solar, wind and hydroelectric systems and the power system infrastructure using smart grids.

Course Objectives

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

- Apply and gain an in-depth knowledge on electrical engineering
- Review the basic circuit analysis covering the Ohm's law and Kirchhoff's laws
- Discuss the basics and applications of laplace transforms in circuit analysis as well as the AC circuits in the frequency domain in phasor analysis
- Recognize transfer function, two-port networks and digital electronic
- Describe boolean algebra and sequential logic circuits and identify the basics and differences of microcontrollers and microprocessors
- Recognize memory devices covering RAM, ROM and EEPROM including the basics of power systems comprising of generation, transmission and distribution
- Discuss the working principle, types and applications of transformers
- Describe synchronous machines, power system protection and power factor and its correction
- Differentiate open loop versus closed loop control systems and apply time domain analysis and frequency domain analysis
- Recognize the stability of control systems, PID controllers and electromagnetic compatibility (EMC)
- Discuss renewable energy systems covering solar, wind and hydroelectric systems
- Modernize the power system infrastructure using smart grids

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 provides an overview of all significant aspects and considerations of electrical engineering for electrical managers, engineers and other technical staff.

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 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: -


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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.

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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

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. Ahmed Hayajneh is a **Senior Electrical & Instrumentations Engineer** with **20 years** of experience in **Oil, Gas, Petrochemical, Refinery & Power** industries. His expertise widely covers in the areas of **Instrumented Protection Systems, Liquid & Gas Flow metering & Meter Calibration, Calibration Techniques, PLC & SCADA** for Automation & Process Control, **Automation Solutions & Techniques, Automating Process Equipment, DCS Automated Process Control Systems, Variable Frequency Drives (VFD), Power System Equipment, Transmission Network Maintenance, Electrical Forecasting Techniques, Inspection Reporting Techniques, Electrical Substation Design & Planning, Electrical Drawings & Schematics, Fault Detection Analysis, Distribution Networks & Load Forecasting, Power Generation, Electrical Power System, Electrical Installations & Utilities, Electrical Distribution Systems & Control Circuits, Electrical Drawings, Relay Logic Circuits, Troubleshooting Transformers, System Grounding, Circuit Breakers, Protection Devices & Technology, Protection Relay, Transformers, Generators, Power Cable Standard and Testing, Power Transformers, Motors, Substations, Switchgears & Distribution, Power System Analysis, Electrical Equipment Control Systems, Transformer Maintenance & Testing, Electrical Substation & Design, Power Quality Studies & Load Criteria, LV/MV Electrical Safety (11 KV, 415 & 220 Voltage), Substation Earthing System, Electrical Equipment Maintenance, Cables & Wiring, Overhead Transmission Lines, Electrical Safety, Electrical Protection, Batteries, Chargers & UPS, Electrical Submersible Pumps (ESP), Power Supply Substations, Area Classification, Safety Management System, Permit to Work & Issuing Authority, Emergency Diesel Generator High & Low Voltage Electrical Safety, Electrical Inspection & Testing, Electrical Control & Monitoring System, Electric Power System, Intensive Overhead Transmission Line (OHTL), Generator Maintenance & Troubleshooting, Transmission Line Networks, Distribution Engineering, HVDC Transmission & Control, Substation Maintenance Techniques and Overhead Power Line Construction & Patrolling.**

Mr. Ahmed gained his expertise and experience through several positions as a **Senior Electrical Project Engineer, Senior Electrical Engineer, Site Electrical Engineer** and **Senior Instructor/Trainer** for various companies such as United Electro-Mechanical International Company, AL OSAIS Contracting Co., ASTRACO, Saudi Service for Electro Mechanic Work Co. (S.S.E.M), Dubai Electricity & Water Authority (DEWA) and Saudi Electricity Company (SEC).

Mr. Ahmed has a **Bachelor's** degree in **Electrical Engineering**. Further, he is a **Certified Instructor/Trainer** and has delivered various trainings, seminars, conferences, workshops and courses globally.



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 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, 13th of October 2024

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	Review of Basic Circuit Analysis: Ohm's Law, Kirchhoff's Laws
0930 – 1030	Laplace Transforms in Circuit Analysis: Basics & Applications
0930 – 0945	Break
0945 – 1100	Phasor Analysis: Understanding AC Circuits in the Frequency Domain
1100 – 1230	Transfer Functions: Analyzing Circuits in the S-Domain
1230 – 1245	Break
1245 – 1420	Two-port Networks: Parameters & Analysis
1420 – 1430	Recap
1430	Lunch & End of Day One

Day 2: Monday, 14th of October 2024

0730 – 0830	Introduction to Digital Electronics: Analog Versus Digital Signals
0830 – 0930	Boolean Algebra: Logic Gates & Simplification
0930 – 0945	Break
0945 – 1045	Sequential Logic Circuits: Flip-Flops, Registers & Counters
1045 – 1230	Microcontrollers & Microprocessors: Basics & Differences
1230 – 1245	Break
1245 – 1420	Memory Devices: RAM, ROM, EEPROM
1420 – 1430	Recap
1430	Lunch & End of Day Two

Day 3: Tuesday, 15th of October 2024

0730 – 0930	Basics of Power Systems: Generation, Transmission, Distribution
0930 – 0945	Break
0945 – 1045	Transformers: Working Principle, Types & Applications
1045 – 1230	Induction & Synchronous Machines: Basics & Performance
1230 – 1245	Break
1245 – 1420	Power System Protection: Circuit Breakers, Relays
1420 – 1430	Recap
1430	Lunch & End of Day Three





Day 4: Wednesday, 16th of October 2024

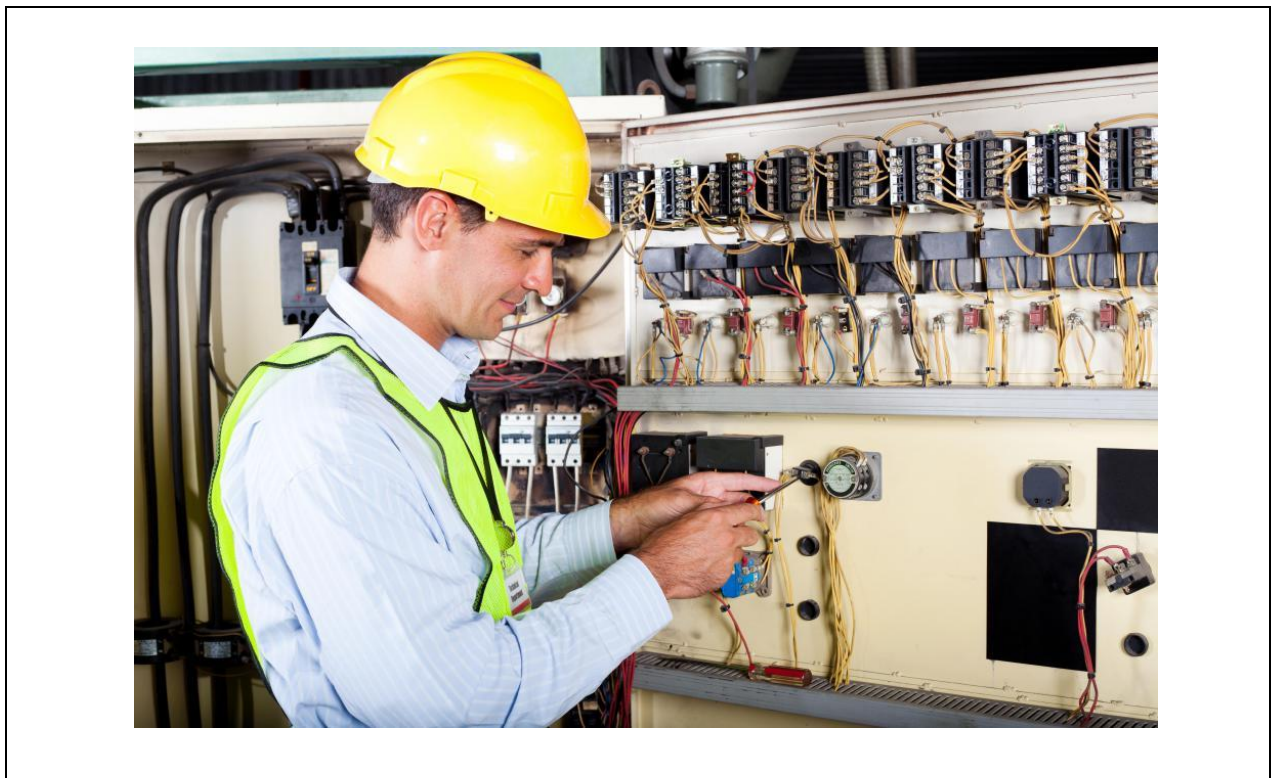
0730 – 0830	<i>Power Factor & Its Correction: Importance in Power Systems</i>
0830 - 0930	<i>Introduction to Control Systems: Open Loop Versus Closed Loop</i>
0930 – 0945	<i>Break</i>
0945 – 1045	<i>Time Domain Analysis: Understanding System Response</i>
1045 – 1230	<i>Frequency Domain Analysis: Bode Plots, Nyquist Plots</i>
1230 – 1245	<i>Break</i>
1245 – 1420	<i>Stability of Control Systems: Routh-Hurwitz, Root Locus</i>
1420 – 1430	<i>Recap</i>
1430	<i>Lunch & End of Day Four</i>

Day 5: Thursday, 17th of October 2024

0730 – 0830	<i>PID Controllers: Proportional, Integral, Derivative Control Actions</i>
0830 - 0930	<i>Electromagnetic Compatibility (EMC): Basics & Importance</i>
0930 – 0945	<i>Break</i>
0945 – 1230	<i>Renewable Energy Systems: Solar, Wind & Hydroelectric Systems</i>
1230 – 1245	<i>Break</i>
1245 – 1345	<i>Smart Grids: Modernizing the Power System Infrastructure</i>
1345 – 1400	<i>Course Conclusion</i>
1400 – 1415	<i>POST-TEST</i>
1415 – 1430	<i>Presentation of Course Certificates</i>
1430	<i>Lunch & End of Course</i>

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:



Course Coordinator

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