COURSE OVERVIEW EE0921
Megger Test Course and Certification

Course Title
Megger Test Course and Certification

Course Reference
EE0921

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

Course Date/Venue

Session(s)	Date	Venue
1	April 14-18, 2024	Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
2	July 07-11, 2024	Al Azziya Hall, The Proud Hotel Al Khobar, KSA
3	September 08-12, 2024	Boardroom , Warwick Hotel Doha, Doha Qatar
4	December 16-20, 2024	Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Description

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 equipment.

This course is designed to provide participants with a detailed and up-to-date overview of Megger testing. It covers the electrical insulation testing; the Megger type testing devices; the power system faults; the insulation resistance testing application and needs; the difference between insulation resistance test instruments; the factors affecting insulation resistance readings; the type of insulation resistance tests; the test voltage, equipment rating, AC testing and DC; the DC electrical test set and dying test; the effect of temperature humidity on insulation resistance; and the safety precaution during insulation test in electrical equipment.

During this interactive course, participants will learn the the minimum value for insulation resistance and leakage in electrical power system; the provision for portable RCD test results; the Megger device for building wiring, power supply and connections; the communication cable with computers; the multi-voltage Megger insulation testers and voltage method; the testing of bushings, potheads and insulators; the Megger 1K.V and 10 K.V insulation test; the combined insulation, continuity, loop, RCD test and earth spike test; and the insights in typical fault condition and key measurements in troubleshooting techniques.

Course Objectives

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

- Get an International Accredited Certificate in Megger Testing
- Carryout electrical insulation testing electric insulation
- Identify Megger type testing devices and explain the importance of insulation measurement in maintenance principles
- Recognize power system faults including the different types of faults, incidence of faults on power systems equipment, effects of power system faults and causes of power system faults
- Employ insulation resistance testing application and apply testing needs
- Describe the difference between insulation resistance test instruments
- Recognize good insulation, measure insulation resistance and interpret resistance reading
- Identify the factors affecting insulation resistance readings and diagnose competent failure, installation problems or potentially an application performance issue
- Recognize the type of insulation resistance tests as well as differentiate test voltage versus equipment rating and AC testing versus DC
- Use DC electrical test set and perform dying test
- Identify the effect of temperature humidity on insulation resistance
- Apply safety precaution during insulation test in electrical equipment
- Identify the minimum value for insulation resistance and leakage in electrical power system
- Review learning provision for portable RCD test results
- Use the Megger device for building wiring, power supply and connections
- Use communication cable with computers and carryout tests using multi-voltage Megger insulation testers and set voltage method
- Test bushings, potheads and insulators and perform Megger 1K.V and 10 K.V insulation test
- Perform combined insulation, continuity, loop, RCD test and earth spike test
- Set up a maintenance program and professional software for Megger in your computer
- Illustrate insights in typical fault condition and key measurements in troubleshooting techniques
- Use data loggers and demonstrate how to write test report certificates

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, sample video clips of the instructor's actual lectures & practical sessions during the course conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of electrical equipment testing for engineers and other technical staff who are involved in the selection, installation, operation, testing, troubleshooting or maintenance of such electrical equipment.

Training Methodology

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Workshops & Work Presentations
30% Case Studies & Practical Exercises
20% Software, Simulators & Videos

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

Course Fee

Dubai	**US$ 5,500** per Delegate + **VAT**. This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Al Khobar	**US$ 5,500** per Delegate + **VAT**. This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Doha	**US$ 6,500** per Delegate. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Abu Dhabi	**US$ 5,500** per Delegate + **VAT**. This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

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

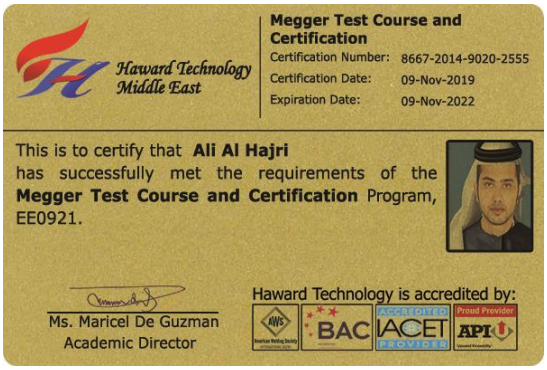
Course Certificate(s)

(1) Internationally recognized Wall Competency Certificates and Plastic Wallet Card Certificates will be issued to participants who completed a minimum of 80% of the total tuition hours and successfully passed the exam at the end of the course. Certificates are valid for 5 years.

Recertification is FOC for a Lifetime.

Sample of Certificates

The following are samples of the certificates that will be awarded to course participants: -



(2) Official Transcript of Records will be provided to the successful delegates with the equivalent number of ANSI/IACET accredited Continuing Education Units (CEUs) earned during the course.

Haward Technology Middle East

Continuing Professional Development (HTME-CPD)

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CEU Official Transcript of Records

TOR Issuance Date: 09-Nov-19

HTME No. 8667-2014-9020-2555

Participant Name: Ali Al Hajri

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
EE0921	Megger Test Course and Certification	November 05-09, 2019	30	3.0

Total No. of CEU's Earned as of TOR Issuance Date **3.0**

TRUE COPY

Maricel De Guzman
Academic Director

Haward Technology has been approved as an Authorized Provider by the International Association for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this approval, Haward Technology has demonstrated that it complies with the ANSI/IACET 1-2013 Standard which is widely recognized as the standard of good practice internationally. As a result of their Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for programs that qualify under the ANSI/IACET 1-2013 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 Association 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 is accredited by

P.O. Box 26070, Abu Dhabi, United Arab Emirates | Tel.: +971 2 3091 714 | Fax: +971 2 3091 716 | E-mail: info@haward.org | Website: www.haward.org

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- 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.

- 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.

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:

Dr. Mike Tay, PhD, MSc, BSc, is a **Senior Electrical**, **Instrumentation & Communications Engineer** with over **40 years** of extensive experience. His expertise widely covers in **Cable & Over Head Line**, **Electrical Drawing**, **Electrical, Distribution Networks**, **Electrical Forecasting**, **Protective Devices** Troubleshooting, **Protective Devices** Testing & Maintenance, **Uninterruptible Power Supply** (**UPS**) Design, Industrial **UPS Systems & Battery Power Supplies** Maintenance & Troubleshooting, **UPS & Battery** System, **Battery & Battery Charger & UPS** and Measurement Devices, UPS **System & Battery Chargers** Maintenance & Troubleshooting, **UPS & Battery** Design, Operation, Maintenance & Troubleshooting, UPS **Operation & Alarm Panel** Reading, **Circuit Breaker**, **HV Switchgear Operation & Maintenance**, **HV/LV Equipment**, **High Voltage Electrical Safety**, **LV & HV Electrical System**, **HV Equipments Inspection & Maintenance**, **LV Distribution Switchgear & Equipment**, **Power Generation Operation & Control**, **Power System Generation and Distribution**, **Power System Protection & Relaying**, **Modern Power System Protective Relaying**, **Protection Relay Maintenance**, **Application** & **Testing**, **System Analysis**, **Power System Faults**, **Protection Scheme Components, Current** & **Voltage Transformers**, **Power System Neutral Grounding**, **Feeder Overcurrent Protection**, **Electrical Protection Systems**, **Bus Protection**, **Motor Protection**, **Starting** & **Control**, **Transformer Protection**, **Generator Protection**, **Capacitor Protection**, **Numerical Relays**, **SCADA Security**, **ESD System Analysis** & **Control**, **Electrical** & **Instrumentation**, **Installation & Inspection**, **Custody Measurement**, **Loss Control** for **Petroleum Products**, **Process Control** & **Instrumentation**, **Fiber Optics Access Network Planning**, **Safety Instrumented System** (**SIS**), **Safety Integrity Level** (**SIL**), **PLC Design**, **Power System**, **Power Supply Design Management**, **Basic Electronics & Transformers**, **Diesel Generator**, **Electric Motors**, **Electrical Fundamentals**, **Basic Electricity** & **Electrical Codes**. Further, he is also well-versed in **Communications**, **Telecommunications**, **Mobile Protocols**, **4G LTE**, **GSM/UMTS**, **CMDA2000**, **WIMAX Technology**, **HSPA+**, **Alarm Management System**, **Computer Architecture**, **Logic & Microprocessor Design**, Embedded Systems Design plus **Computer Networking** with **CISCO**, **Network Communication**, **Industrial Digital Communication**, **Designing Telecommunications Distribution System**, **Electrical Engineering**, **WiMAX Broadband Wireless System**, **TT Intranet** & **ADSL Network**, **TT Web** & **Voicemail**, **Off-site ATM Network**, **IT Maintenance**, **Say2000i**, **IP Phone**, **National Address** & **ID Automation**, **Electricity Distribution Network**, **Customs Network** & **Maintenance**, **LAN** & **WAN Network**, **UYAP Network**, **Network Routing Protocols**, **Multicast Protocols**, **Network Management Protocols**, **Mobile** & **Wireless Networks** and **Digital Signal Processing**. **Currently**, he is the **Technical Advisor** of **Izmir Altek**.

During his career life, Dr. Tay worked with various companies such as the **KOC Sistem**, **Meteksan Sistem**, **Altek BT**, **Yasar University**, **Dokuz Eylul University**, **METU** and occupied significant positions like the **Aegean Region Manager**, **Group Leader**, **Technical Services Manager**, **Field Engineer**, **Research Assistant**, **Instructor**, **Technical Advisor** and the **Dr. Instructor**.

Dr. Tay has **PhD**, **Master's** and **Bachelor's** degree in **Electrical & Electronic Engineering** from the **Dokuz Eylul University** and the **Middle East Technical University** (**METU**) respectively. Further, he is a **Certified Instructor/Trainer**, **Technical Trainer (Australia)**, **Trainer** for **Data-Communication System (England & Canada)**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management** (**ILM**), a **Certified CISCO** (**CCSP**, **CCDA**, **CCNP**, **CCNA**, **CCNP**) **Specialist**, a **Certified CISCO IP Telephony Design Specialist**, **CISCO Rich Media Communications Specialist**, **CISCO Security Solutions** & **Design Specialist** and **Information Systems Security** (**INFOSEC**) **Professional**. He has delivered and presented innumerable training courses and workshops worldwide.

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

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0900	***Introduction, Overview & Discussion of Objectives***
0900 – 0930	***Complete Guide to Electrical Insulation Testing Electric Insulation***
0930 – 0945	*Break*
0945 – 1100	***Testing Devices (Megger Type)***
1100 – 1130	***Why Insulation Measurement are Important in Maintenance Principles?***
1100 – 1215	***Power System Faults*** *Different Types of Faults ● Incidence of Faults on Power System Equipment ● Effects of Power System Faults ● Causes of Power System Faults*
1215 – 1230	*Break*
1230 – 1330	***Insulation Resistance Testing Application & How we Apply to your Testing Needs***
1330 – 1420	***The Difference Between Insulation Resistance Test Instruments***
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***What is the Good Insulation?***
0830 – 0930	***What Makes Insulation Go Bad***
0930 – 0945	*Break*
0945 – 1100	***How Insulation Resistance is Measured?***
1100 – 1130	***How to Interpret Resistance Reading?***
1130 – 1215	***The Factors Effecting Insulation Resistance Readings***
1215 – 1230	*Break*
1230 – 1330	***How to Diagnose a Problems (is it a Competent Failure, Installation Problems, or Potentially an Application Performance Issue)***
1330 – 1420	***Type of Insulation Resistance Tests***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0830	***Test Voltage versus Equipment Rating***
0830 – 0930	***AC Testing versus DC***
0930 – 0945	*Break*
0945 – 1100	***Using of DC Electrical Test Set***
1100 – 1130	***Dying Test***
1130 – 1215	***Effect of Temperature Humidity on Insulation Resistance***
1215 – 1230	*Break*
1230 – 1330	***Safety Precaution during Insulation Test in Electrical Equipment's***
1330 – 1420	***What is the Minimum Value for Insulation Resistance & Leakage in Electrical Power System***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0830	***Learning Provision for Portable RCD Test Results***
0830 – 0930	***Using the (Megger) Device Practical in the Following Exercises & How Often Should You Test?***
0930 – 0945	*Break*
0945 – 1100	***Building Wiring***
1100 – 1130	***Power Supply & Connections***
1130 – 1215	***Using the Communication Cable with Computers***
1215 – 1230	*Break*
1230 – 1330	***Tests Using Multi-Voltage Megger Insulation Testers, Set Voltage Method*** *Use the Guard Terminal in the Insulation Tests*
1330 – 1420	***Test the Bushings, Potheads & Insulators***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 – 0830	***Megger 1 K.V & 10 K.V Insulation Test***
0830 – 0930	***Do Combined Insulation, Continuity, Loop, RCD Test & Earth Spike Test***
0930 – 0945	*Break*
0945 – 1100	***Setting Up a Maintenance Program & Set Up Professional Software for Megger in Your Computer***
1100 – 1200	***Learning Insights in Typical Fault Condition & Key Measurements in Troubleshooting Techniques***
1200 – 1215	*Break*
1215 – 1230	***Using Data Loggers***
1230 – 1300	***How to Write Test Report Certificates***
1300 – 1315	***Course Conclusion***
1315 – 1415	***COMPETENCY EXAM***
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 electrical insulation testing using the "Insulation Resistance Tester", suitable for classroom training.

Insulation Resistance Tester

Course Coordinator

Kamel Ghanem, Tel: +971 2 30 91 714, Email: kamel@haward.org