COURSE OVERVIEW FE0123
Corrosion Inspection, Corrosion Testing and Monitoring

Course Title
Corrosion Inspection, Corrosion Testing and Monitoring

Course Reference
FE0123

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

Course Date/Venue

Session(s)	Date	Venue
1	May 05-09, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
2	August 24-28, 2025	Boardroom, Sheraton Dubai Creek Hotel & Towers, Dubai, UAE
3	September 29-October 03, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
4	December 14-18, 2025	Boardroom, Sheraton Dubai Creek Hotel & Towers, Dubai, UAE

Course Description

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

This course is designed to provide participants with a detailed and up-to-date overview of Corrosion Inspection, Corrosion Testing and Monitoring. It covers the various types of corrosion and the impact of corrosion on materials and structures; the corrosion inspections, visual inspection techniques and non-destructive testing (NDT) for corrosion; the corrosion documentation and standards and codes in corrosion inspection; the corrosion testing, salt spray testing, electrochemical testing methods and corrosion fatigue testing; and the differences between lab-based and field corrosion testing and the pros and cons of laboratory testing.

During this interactive course, participants will learn the material selection for corrosion resistance, electrical resistance (ER) monitoring and galvanic corrosion monitoring; the corrosion coupons and probes, ultrasonic thickness testing (UTT), corrosion inhibitor monitoring and coatings and surface treatments; the cathodic protection systems, environmental control methods and corrosion-resistant alloys; the integrated corrosion management programs, troubleshooting corrosion issues and corrosion in extreme environments; and the corrosion management in aging infrastructure and the future trends in corrosion monitoring.

Course Objectives

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

- Apply and gain an in-depth knowledge on corrosion inspection, corrosion testing and monitoring
- Identify the various types of corrosion and the impact of corrosion on materials and structures
- Carryout corrosion inspections, visual inspection techniques and non-destructive testing (NDT) for corrosion
- Discuss corrosion documentation and the standards and codes in corrosion inspection
- Apply corrosion testing, salt spray testing, electrochemical testing methods and corrosion fatigue testing
- Explain the differences between lab-based and field corrosion testing and the pros and cons of laboratory testing
- Identify material selection for corrosion resistance and apply electrical resistance (ER) monitoring and galvanic corrosion monitoring
- Recognize corrosion coupons and probes and carryout ultrasonic thickness testing (UTT), corrosion inhibitor monitoring and coatings and surface treatments
- Discuss cathodic protection systems, environmental control methods and corrosion-resistant alloys
- Develop integrated corrosion management programs, troubleshoot corrosion issues and interpret corrosion in extreme environments
- Apply corrosion management in aging infrastructure and discuss the future trends in corrosion monitoring

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 corrosion inspection, corrosion testing and monitoring for operations and production engineers, corrosion engineers, materials engineers, maintenance engineers, project engineers / designers, metallurgists, asset integrity technicians, NDT technicians, monitoring and data analysis personnel, health, safety and environment (HSE) officers and other technical staff.

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.

  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.

- 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.

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. George Poulos, MBA, MSc, BSc, CEng, is a **Senior Corrosion & Metallurgical Engineer** with over **30 years** of extensive experience within the **Oil & Gas, Petrochemical, Refinery, Construction, Aircraft & Shipbuilding** Industry. His wide experiences cover in the areas of **Corrosion in Urea & Ammonia Plants,** Corrosion and **Metallurgy**, Analysis & Prevention, **Corrosion** Fabrication & Inspection, **Fabrication** & **Repair**, **Corrosion** Prevention, **Corrosion** Engineering, **Corrosion Control**, **Corrosion Inhibition**, **Corrosion** Management in Process Operations, **Corrosion** & Prevention of Failures, **Pressure Vessels**, **Piping Inspection**, **Risk-Based Inspection**, **Fitness-for-Service** (**FFS**), **Metallurgical** Failure, **Metallurgy & Metallurgical Processes, Metallurgical** Lab, **Material** Selection, **Cathodic Protection** Systems, **Steel Metallurgy**, **Steel** Structure Welding, **Steelmaking** Slag, **Steel** Making Application, **Steel Making** Process, **Steel** Manufacturing, **Steel Forging**, **Steel** Manufacturing & Process Troubleshooting, **Hot Rolling** Process, **Hot Strip Mill**, **Mill** Operations, **Roll Mill**, **Electric Arc Furnace** (**EAF**), **Slit Rolling**, **Carbon Steel Pipe** Wall Thickness & Grade Selection, **Ferro-Alloys**, **Heat Treatment** & **Prevention Techniques** and **Post Weld Heat Treatment**. Further, he is also well-versed in **Welding** Inspection, **Welding** & **Machine** Techniques, **TIG** & **Arc Welding**, **Shielded Metal Arc Welding**, **Gas Tungsten** & **Gas Metal Arc Welding**, **Welding** Procedure Specifications & Qualifications, **Aluminium Welding**, **Hot Work-Safety**, **SMAW**, **GTAW**, **Welding** Techniques, **Pipeline Welding** Practices, **Welding** Engineering, **Welding** Fatigue & Fracture Mechanics, **Welding Inspection Technology**, **Welding Safety**, **Welding** Defects Analysis, **Welding Technology**, **Welding Problems**, **Welding & Non Destructive** Testing and **Metallurgy Techniques**.

During his career life, Mr. Poulos has gained his practical and field experience through his various significant positions and dedication as the **Chief Executive**, **Head of Technical Studies**, **Manager**, **Senior Consultant**, **Lead Welding Engineer**, **Senior Welding Engineer**, **Design Engineer**, **Sales Engineer**, **Author**, **Welding Instructor**, **Visiting Lecturer** and **Technical Proposal Research Evaluator** from various international companies such as Greek Welding Institute, Hellenic Quality Forum and International Construction Companies such as Shipbuilding, Aircraft Industry and Oil and Gas Industry.

Mr. Poulos is a **Registered Chartered Engineer** and has a **Master's** degree in **Naval Architecture**, a **Bachelor's** degree in **Welding Engineering** and a Master of Business Administration (**MBA**) from the **Sunderland University**, **Aston University** and **Open University**, **UK**, respectively. Further, he is a **Certified Trainer/Instructor**, an active Member of Chartered Quality Institute (**CQI**), The British Welding Institute (**TWI**), The Royal Institution of Naval Architects (**RINA**) and American Welding Society (**AWS**), a Registered **EWF/IW** (European Welding Federation-International Welding Institute W/E) and an **IRCA** Accredited External Quality Systems Auditor through BVQI. He is an **Author** of Technical Book dealing with Protection/Health/Safety in the Welding/Cutting domain and 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 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.

Accommodation

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

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 – 0930	***Introduction to Corrosion*** *Definition and Types of Corrosion • Electrochemical Corrosion Mechanisms • Types of Corrosion (Uniform, Pitting, Galvanic, etc.) • Impact of Corrosion on Materials and Structures*
0930 - 0945	*Break*
0945 – 1045	***Corrosion Inspection: Overview*** *Importance of Corrosion Inspections • Roles of Corrosion Inspectors • Common Tools Used in Corrosion Inspection • Corrosion Monitoring in Industries*
1045 - 1145	***Visual Inspection Techniques*** *Visual Signs of Corrosion • Inspection Procedures and Standards • Factors Influencing Corrosion Visibility • Common Defects Identified via Visual Inspection*
1145 - 1230	***Non-Destructive Testing (NDT) for Corrosion*** *Principles of NDT • Common NDT Techniques (Ultrasonic, Radiographic, Magnetic Particle) • Applications in Corrosion Inspection • NDT Standards and Codes*
1230 – 1245	*Break*
1245 – 1330	***Basics of Corrosion Documentation*** *Recording and Reporting Corrosion Findings • Using Inspection Checklists • Documenting Severity and Location of Corrosion • Analysis and Reporting of Inspection Data*

1330 - 1420	***Standards &Codes in Corrosion Inspection*** *International Standards (ISO, ASTM) • Industry-Specific Codes (API, ASME) • Role of Codes in Inspection Procedures • Compliance and Certification in Corrosion Inspection*
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

0730 – 0830	***Corrosion Testing*** *Types of Corrosion Tests (Accelerated, Field, Laboratory) • Purpose of Corrosion Testing in Material Selection • Common Materials Tested for Corrosion Resistance • Standards for Corrosion Testing*
0830 – 0930	***Salt Spray Testing (ASTM B117)*** *Principles of Salt Spray Test • Equipment and Setup for Salt Spray Testing • Interpreting Salt Spray Test Results • Applications in Coating and Material Testing*
0930 - 0945	*Break*
0945 – 1130	***Electrochemical Testing Methods*** *Basic Principles of Electrochemical Corrosion Testing • Techniques: Potentiodynamic Polarization, EIS, LPR • Electrochemical Cells and Setups • Interpreting Electrochemical Corrosion Data*
1130 - 1230	***Corrosion Fatigue Testing*** *Corrosion Fatigue Process • Influence of Cyclic Loading on Corrosion • Testing for Corrosion Fatigue • Practical Implications in Material Selection*
1230 - 1245	*Break*
1245 - 1330	***Laboratory versus Field Testing*** *Differences Between Lab-Based and Field Corrosion Testing • Pros and Cons of Laboratory Testing • Real-World Applicability of Field Testing Methods • Common Field Testing Challenges and Solutions*
1330 - 1420	***Corrosion Resistance of Materials*** *Material Selection for Corrosion Resistance • Impact of Environment on Material Corrosion Resistance • Testing Corrosion Resistance of Metals, Alloys, and Coatings • Evaluation of Materials Based on Corrosion Data*
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

0730 – 0830	***Corrosion Monitoring*** *Importance of Continuous Corrosion Monitoring • Techniques for Real-Time Monitoring • Types of Monitoring Systems and Technologies • Benefits of Corrosion Monitoring Over Periodic Inspections*
0830 – 0930	***Electrical Resistance (ER) Monitoring*** *Principles of Electrical Resistance Monitoring • Application of ER in Real-Time Monitoring • Advantages and Limitations of ER Monitoring • Setup and Installation of ER Probes*

0930 - 0945	*Break*
0945 – 1130	***Galvanic Corrosion Monitoring*** *Understanding Galvanic Corrosion and Its Monitoring • Use of Sacrificial Anodes for Monitoring • Continuous Monitoring of Galvanic Corrosion • Galvanic Corrosion Monitoring in Marine Environments*
1130 - 1230	***Corrosion Coupons & Probes*** *Function of Corrosion Coupons and Probes • Materials and Installation of Coupons • Monitoring Coupon Weight Loss and Corrosion Rates • Case Studies Using Corrosion Coupons*
1230 - 1245	*Break*
1245 - 1330	***Ultrasonic Thickness Testing (UTT)*** *Basics of Ultrasonic Testing for Corrosion Monitoring • Equipment and Procedure for Thickness Measurement • Interpreting UTT Data for Corrosion Monitoring • Comparison of UTT with Other Corrosion*
1330 - 1420	***Corrosion Inhibitor Monitoring*** *Role of Corrosion Inhibitors in Corrosion Control • Monitoring the Effectiveness of Corrosion Inhibitors • Testing Methods for Inhibitor Concentrations • Applications of Corrosion Inhibitors in Industry*
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

0730 – 0830	***Corrosion Control*** *Strategies for Preventing and Controlling Corrosion • Comparison of Corrosion Control Methods • Cost-Effective Solutions for Corrosion Control • Importance of Corrosion Prevention in Industrial Applications*
0830 – 0930	***Coatings & Surface Treatments*** *Types of Protective Coatings (Paint, Galvanizing, Plating) • Application Methods for Coatings • Testing and Inspection of Coatings for Durability • Advancements in Corrosion-Resistant Coatings*
0930 - 0945	*Break*
0945 – 1130	***Cathodic Protection Systems*** *Fundamentals of Cathodic Protection • Design and Installation of Cathodic Protection Systems • Monitoring and Maintenance of Cathodic Protection • Application in Pipelines, Tanks, and Marine Structures*
1130 - 1230	***Environmental Control Methods*** *Role of Environmental Conditions in Corrosion (Humidity, Temperature) • Environmental Control for Corrosion Prevention • Sealing, Ventilation, and Environmental Management Systems • Case Studies on Environmental Control Measures*
1230 - 1245	*Break*
1245 - 1330	***Corrosion-Resistant Alloys*** *Use of Alloys in Corrosion-Resistant Applications • Testing Corrosion Resistance of Alloys • Factors Influencing Alloy Performance • Selection of Alloys for Specific Environments*

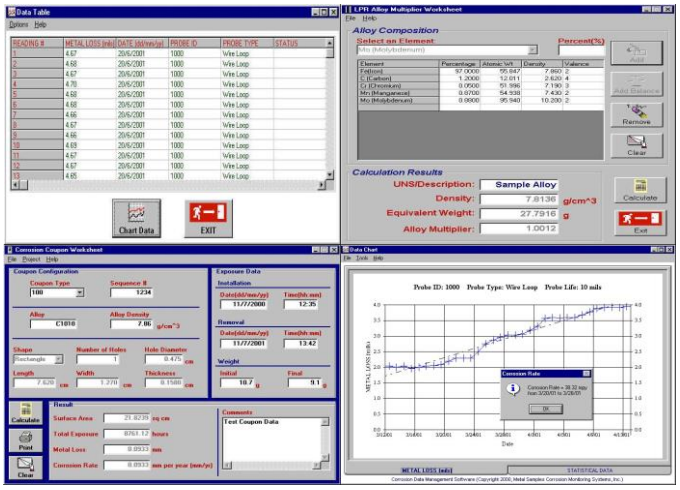
1330 - 1420	***Integrated Corrosion Management Programs*** *Developing a Comprehensive Corrosion Management Program • Role of Inspections, Testing, and Monitoring • Case Studies of Successful Corrosion Management Programs • Risk-Based Approach to Corrosion Management*
1420 – 1430	***Recap*** *Using this 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

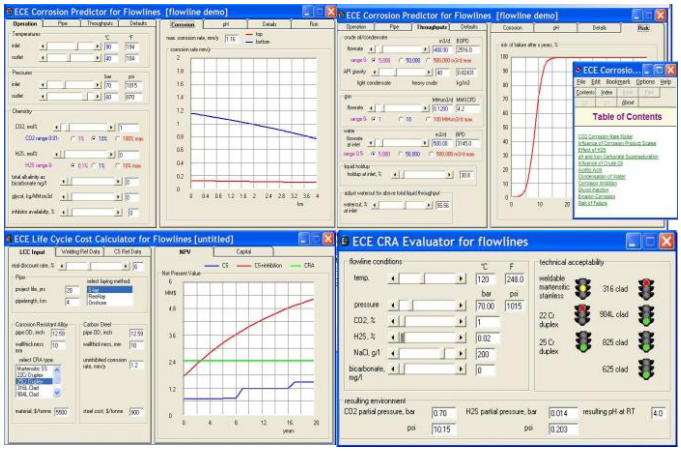
0730 – 0930	***Case Study: Industrial Corrosion Failures*** *Analysis of Historical Industrial Corrosion Failures • Lessons Learned from Real-World Corrosion Incidents • Failure Modes and Their Impact on Operations • Mitigation Strategies and Future Prevention*
0930 - 0945	*Break*
0945 - 1100	***Troubleshooting Corrosion Issues*** *Identifying Corrosion Problems in Systems • Common Troubleshooting Techniques for Corrosion • Analyzing Corrosion Reports and Test Data • Corrective Actions for Identified Corrosion Problems*
0945 – 1100	***Corrosion in Extreme Environments*** *Corrosion Challenges in High-Temperature and High-Pressure Systems • Corrosion in Offshore, Marine, and Chemical Environments • Design Considerations for Extreme Corrosion Environments • Monitoring and Testing in Extreme Conditions*
1100 – 1230	***Corrosion Management in Aging Infrastructure*** *Corrosion Control Strategies for Aging Assets • Condition-Based Monitoring for Aging Infrastructure • Life Extension Through Corrosion Management • Regulatory Considerations for Managing Aging Systems*
1230 - 1245	*Break*
1245 - 1345	***Future Trends in Corrosion Monitoring*** *Emerging Technologies in Corrosion Detection • AI and Machine Learning for Predictive Corrosion Monitoring • Smart Coatings and Sensors for Corrosion Detection • The Role of IoT in Corrosion Management*
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 the simulators “Corrosion Data Management Software (CDMS)” and “Electronic Corrosion Engineer (ECE®) 5”.



Corrosion Data Management Software (CDMS)



Electronic Corrosion Engineer (ECE®) 5

Course Coordinator

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