

COURSE OVERVIEW FE0066

Corrosion & Fouling

Course Title

Corrosion & Fouling

Course Date/Venue

Please see page 3

Course Reference

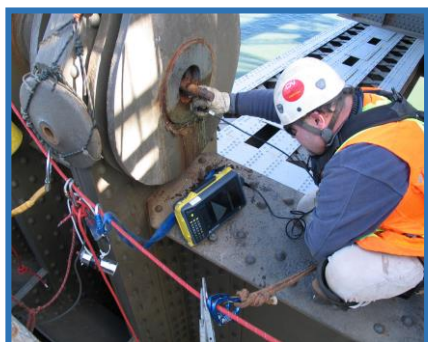
FE0066

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 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 & Fouling. It covers the basic concepts and importance of corrosion and fouling in refinery maintenance; the types of corrosion like chemical, galvanic, pitting, crevice and intergranular corrosion; the common refinery corrosion problems; the types of fouling like biological, chemical, physical and their characteristics; the effects of corrosion and fouling on equipment performance; the safety risks and environmental impact of unchecked corrosion and fouling; the mechanisms of corrosion including the electrochemical processes and environmental factors affecting corrosion rates; and the fouling mechanisms, how fouling occurs and the factors that accelerate fouling in refineries.



During this interactive course, participants will learn the corrosion and material selection; monitoring corrosion and fouling; the control strategies for corrosion and fouling; evaluating benefits and liabilities of control strategies; the design considerations to mitigate corrosion and fouling; managing less common corrosion and fouling problems; the innovative technologies in corrosion and fouling control; integrating corrosion management into reliability-focused maintenance practices; and the predictive maintenance for corrosion control.

Course Objectives

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

- Apply and gain a comprehensive knowledge on corrosion and fouling
- Identify common refinery corrosion and fouling problems, including where they typically occur
- Describe the type of corrosion or fouling that is present based on location, process conditions, and symptoms
- Identify control strategies for common corrosion and fouling problems, including their benefits and liabilities
- Use problem-solving techniques to resolve corrosion problems
- Apply knowledge of corrosion and fouling management to solve less common problems
- Discuss the basic concepts and importance of corrosion and fouling in refinery maintenance
- Identify the types of corrosion and understand chemical, galvanic, pitting, crevice and intergranular corrosion
- Recognize common refinery corrosion problems as well as locate where corrosion is most likely to occur
- Identify the types of fouling like biological, chemical, physical and their characteristics
- Explain the effects of corrosion and fouling on equipment performance as well as analyze how corrosion and fouling impact refinery operations
- Discuss the safety risks and environmental impact of unchecked corrosion and fouling
- Recognize the mechanisms of corrosion including the electrochemical processes and environmental factors affecting corrosion rates
- Explain fouling mechanisms, how fouling occurs and the factors that accelerate fouling in refineries
- Carryout proper material selection to prevent corrosion and identify corrosion-resistant materials
- Employ appropriate techniques and tools for monitoring including corrosion coupons and electronic probes
- Develop control strategies for corrosion focusing on cathodic protection, coating systems and corrosion inhibitors
- Use control strategies for fouling like mechanical cleaning, chemical cleaning, and antifoulants
- Evaluate benefits and liabilities of control strategies and explain cost-benefit analysis, potential risks and environmental impacts
- Design modifications and process control improvements to mitigate corrosion and fouling

- Apply systematic techniques to resolve specific corrosion and fouling problems
- Manage less common corrosion and fouling problems and apply proper strategies and insights on handling complex issues
- Discuss new advancements in corrosion and fouling control and their practical applications
- Integrate corrosion management into reliability-focused maintenance practices
- Carryout predictive maintenance for corrosion control as well as utilize data analytics and predictive modeling

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 a wide understanding and deeper appreciation of corrosion and fouling for facility integrity engineers, inspection engineers, metallurgy and corrosion engineers, materials engineers, design engineers, mechanical engineers, chemical engineers, corrosion field personnel, supervisors and other technical staff will find the course very attractive. Senior engineers and managers will be able to develop their interpretive skills in data analysis.

Course Date/Venue

Session(s)	Date	Venue
1	September 22-26, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
2	October 05-09, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
3	November 23-27, 2025	Safir Meeting Room, Divan Istanbul, Taksim, Turkey
4	December 21-25, 2025	Crowne Meeting Room, Crowne Plaza Al Khobar, an IHG Hotel, Al Khobar, KSA

Course Fee


Abu Dhabi/Dubai/Al Khobar	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.
Istanbul	US\$ 6,000 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

Haward's 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**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). 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. Greg Combrink, MSc, BSc, is a **Senior Corrosion Engineer** with over **30 years** of industrial experience within the **Oil, Gas, Petrochemical, Refinery, Utilities and Power** industries. His wide expertise widely covers in the areas of **Corrosion Control & Monitoring, Corrosion Inhibition, Inhibitor Effectiveness Calculation, Metallurgy, Corrosion Failure Investigation, Environmental Testing for Corrosivity Classification, Stress Corrosion Cracking Investigations & Testing, Corrosion Testing & Evaluation, Corrosion Mitigation, Corrosion & Cathodic Protection Survey, Corrosion & Material Testing, Corrosion Cracking Investigations & Testing, Corrosion Prevention & Risk, Cathodic Protection Systems Design & Implementation, Coating Technology & Applications, Coating Inspection & Corrosion Mechanism, Coating Application & Quality Control, Metal Casting Technology, Material Sustainability Testing, Material Selection Testing, Electrochemical & Exposure Testing, Contamination Control of Lubricants/Fuels & Process Fluids, Tribology & Lubrication, Rust Removal, NDT Testing, Underground Minerals Corrosivity, Conventional & Air Spray Coating, Stainless Steel Welded Tanks, Heat & Mass Transfer, Metal Analysis and Friction Testing & Non-Skid Surfaces.**

During his career life, Mr. Combrink has gained his practical and field experience through his various significant positions and dedication as the **CEO/Technical Director, Corrosion Engineering Director, Corrosion Engineer, Officer-in-Charge & General Manager, Technical Manager, Programme Manager, Corrosion Projects Manager, Corrosion Specialist, Metalworking Product Applications Engineer, Manager/Officer-In-Charge Materials Lab, Sub-Lieutenant, Senior Instructor/Trainer and Reactor Technician** for various companies such as the Corrosion Hub, Total Contamination Control SA (Pty) Ltd, Bora Corrosion Solutions, Solar Even Pty Ltd, University of Johannesburg, University of Witwatersrand, Castrol South Africa, Sa Navy, SA Police, Geyser Enode and Metal Casting Technology Station.

Mr. Combrink has a **Master's degree in Corrosion Science & Engineering** from the **University of Manchester Institute of Science and Technology (UMIST), UK** and a **Bachelor's degree in Chemical Engineering**. Further, he is an **Accredited Assessor & Moderator** from the South African Qualifications Authority (**SAQA**) and an **Accredited Assessor & Committee Member (Corrosion Protection)** from the South African Qualification & Certification Committee (**SAQCC**). He is also a **Fellow** from the Corrosion Institute Ghana (**CorrIGh**), an **Executive Committee Member/Former President** from the Corrosion Institute of Southern Africa (**CorrISA**) and a **Member** of the Southern African Institute of Tribology (**SAIT**) and has further delivered numerous trainings, courses, seminars, conferences and workshops 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

0730 – 0815	<i>Registration & Coffee</i>
0815 – 0830	<i>Welcome & Introduction</i>
0830 – 0845	PRE-TEST
0845 – 0900	Overview of Corrosion & Fouling: Introduction to the Basic Concepts, Definitions, and Importance in Refinery Maintenance
0900 – 0930	Types of Corrosion: Understanding Chemical, Galvanic, Pitting, Crevice, and Intergranular Corrosion
0930 – 0945	<i>Break</i>
0945 – 1030	Common Refinery Corrosion Problems: Identification & Locations Where Corrosion is Most Likely to Occur
1030 – 1230	Introduction to Fouling: Types of Fouling (Biological, Chemical, Physical) and their Characteristics
1230 -1245	<i>Break</i>
1245 – 1415	Effects of Corrosion & Fouling on Equipment Performance: Analyzing How Corrosion and Fouling Impact Refinery Operations
1415 - 1430	Recap
1430	<i>Lunch & End of Day One</i>

Day 2

0730 – 0830	Safety & Environmental Considerations: Discussing the Safety Risks and Environmental Impact of Unchecked Corrosion and Fouling
0830 – 0930	Mechanisms of Corrosion: Electrochemical Processes, Environmental Factors Affecting Corrosion Rates
0930 – 0945	<i>Break</i>
0945 – 1100	Fouling Mechanisms: How Fouling Occurs, Factors that Accelerate Fouling in Refineries
1100 – 1230	Corrosion & Material Selection: How Material Selection can Prevent Corrosion, Examples of Corrosion-Resistant Materials
1230 - 1245	<i>Break</i>
1245 – 1415	Monitoring Corrosion & Fouling: Techniques & Tools for Monitoring, including Corrosion Coupons & Electronic Probes
1415 – 1430	Recap
1430	<i>Lunch & End of Day Two</i>

Day 3

0730 – 0830	Case Study Discussion: Real-World Examples of Corrosion and Its Resolution
0830 – 0930	Group Activity: Identifying Corrosion Types from Provided Scenarios & Photographs
0930 – 0945	Break
0945 – 1100	Control Strategies for Corrosion: Cathodic Protection, Coating Systems, Corrosion Inhibitors
1100 – 1230	Control Strategies for Fouling: Mechanical Cleaning, Chemical Cleaning, and Antifoulants
1230 - 1245	Break
1245 – 1415	Evaluating Benefits & Liabilities of Control Strategies: Cost-Benefit Analysis, Potential Risks, and Environmental Impacts
1415 – 1430	Recap
1430	Lunch & End of Day Three

Day 4

0730 – 0930	Design Considerations to Mitigate Corrosion & Fouling: Design Modifications & Process Control Improvements
0930 - 0945	Break
0945 – 1100	Problem-Solving Workshop: Applying Techniques to Resolve Specific Corrosion & Fouling Problems
1100 – 1230	Interactive Q&A Session: Solving Participant Queries with Expert Responses
1230 - 1245	Break
1245 - 1415	Managing Less Common Corrosion & Fouling Problems: Strategies and Insights on Handling Complex Issues
1415 - 1430	Recap
1430	Lunch & End of Day Four

Day 5

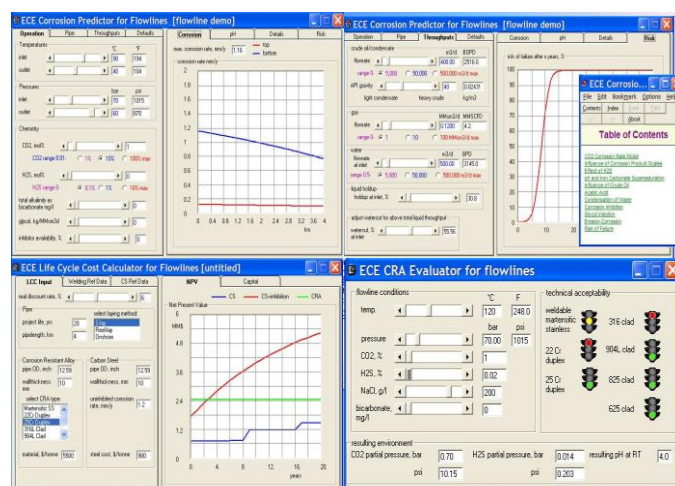
0730 – 0930	Innovative Technologies in Corrosion & Fouling Control: New Advancements and their Practical Applications
0930 - 0945	Break
0945 – 1045	Reliability Engineering & Asset Integrity: Integrating Corrosion Management into Reliability-Focused Maintenance Practices
1045 – 1230	Predictive Maintenance for Corrosion Control: Utilizing Data Analytics and Predictive Modeling
1230 - 1245	Break
1245 - 1345	Workshop: Simulation of Corrosion Management: Participants Use Simulation Software to Manage Hypothetical Corrosion Scenarios
1345-1400	Course Conclusion
1400 - 1415	POST-TEST
1415 - 1430	Presentation of Course Certificates
1400	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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