

MATERIALS & CORROSION ENGINEERING FOR THE ONSHORE, OFFSHORE & SUBSEA ENVIRONMENT

"Protecting Critical Infrastructure through Advanced Materials and Corrosion Control Strategies"

Schedule

Venue (InHouse)	Fees
At Your Organization Premises	Ask For The Quotation

► **Available delivery methods:** Face-to-Face & Online Training, In-House Training

Introduction

This comprehensive course explores the selection of engineering materials and the management of corrosion challenges across onshore, offshore, and subsea oil & gas environments. Participants will develop a deep understanding of how materials behave in harsh environments, the mechanisms of corrosion, and how to select appropriate protection and monitoring methods. Through real-world case studies and industry practices, the course emphasizes design, integrity assurance, and lifecycle management in energy operations.

Objectives

By the end of this course, participants will be able to:

- Identify key corrosion mechanisms in different environments
- Select and evaluate materials for strength, durability, and corrosion resistance
- Apply appropriate corrosion protection systems (coatings, CP, inhibitors)
- Design with corrosion in mind for subsea, offshore, and onshore facilities
- Interpret corrosion monitoring data and inspection results

Why Attend

- Gain technical expertise essential for infrastructure reliability
- Minimize downtime and failure due to corrosion-related issues
- Enhance asset lifecycle performance with correct material selection
- Stay aligned with industry standards such as NACE, ISO, and API

Target Audience

- Corrosion and materials engineers
- Mechanical and pipeline engineers
- Asset integrity professionals
- Offshore & subsea operations engineers
- Project engineers and maintenance planners
- HSE and quality assurance specialists

Individual Benefits

- Improve technical decision-making on material and design selection
- Enhance understanding of failure mechanisms and how to mitigate them
- Increase value as a multidisciplinary contributor in asset integrity projects
- Acquire practical skills applicable across project lifecycles

Organizational Benefits

- Reduce costly equipment failures and maintenance overheads
- Extend asset service life through proper materials and corrosion strategies
- Comply with international codes and standards for safety and performance
- Strengthen project design, operations, and inspection teams

Instructional Methodology

- Expert-led lectures with visual examples
- Real case studies from global oil & gas assets
- Interactive problem-solving and design exercises
- Corrosion testing interpretation and field report analysis
- Group discussions and peer learning

Course Outline

DETAILED 5-DAY COURSE OUTLINE (Customizable) Training Hours: 07:30 AM – 03:30 PM Daily Format: 3–4 Modules | Coffee breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 – 02:00

Day 1 - Introduction to Materials & Corrosion in Harsh Environments

- Module 1 (07:30 – 09:30): Basics of Materials Engineering & Environmental Exposure
- Module 2 (09:45 – 11:15): Corrosion Science: Mechanisms and Forms (General, Pitting, Crevice, etc.)
- Module 3 (11:30 – 01:00): Onshore vs Offshore vs Subsea: Environmental Challenges and Design Impacts

Day 2 - Material Selection and Compatibility

- Module 4 (07:30 – 09:30): Ferrous and Non-Ferrous Alloys for Oil & Gas Applications
- Module 5 (09:45 – 11:15): Material Compatibility, Degradation, and Failure Modes
- Module 6 (11:30 – 01:00): Subsea and Sour Service Considerations in Material Selection (H₂S, CO₂, Chlorides)

Day 3 - Corrosion Protection Systems

- Module 7 (07:30 – 09:30): Cathodic Protection (Galvanic & Impressed Current)
- Module 8 (09:45 – 11:15): Coatings: Types, Selection Criteria, and Failures
- Module 9 (11:30 – 01:00): Corrosion Inhibitors and Their Application Methods

Day 4 - Inspection, Monitoring, and Risk Assessment

- Module 10 (07:30 – 09:30): Corrosion Monitoring Technologies (ER, LPR, UT, etc.)
- Module 11 (09:45 – 11:15): Risk-Based Inspection (RBI) and Fitness-for-Service Approaches
- Module 12 (11:30 – 01:00): Failure Analysis and Reporting for Corrosion Cases

Day 5 - Design Integration and Case Studies

- Module 13 (07:30 – 09:30): Designing for Corrosion Resistance in Pipelines, FPSOs, and Topsides
- Module 14 (09:45 – 11:15): Integrated Corrosion Management Programs (ICMPs)
- Module 15 (11:30 – 01:00): Real Industry Case Studies and Final Wrap-Up Session

Certification

Participants will receive a Certificate of Completion in Materials & Corrosion Engineering, demonstrating their applied knowledge of corrosion control and engineering materials across energy infrastructures.

Why Choose MAWA Events

- **Global Expertise:** More than 17 years of experience in professional training and consulting.
- **Industry-Leading Faculty:** Courses delivered by seasoned professionals with hands-on experience.
- **Practical Insights:** Learn to turn theory into actionable strategies for real-world business impact.
- **Client-Focused Solutions:** Customized programs designed to achieve your organisation's unique goals.

In-House / Customized Training

Interested in running this course for your team?

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