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INSTITUTE OF CORROSION

Engineering Training Governing Board (ETGB)

Training Courses

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Contents

1 | Introduction

The Engineering Training Governing Board (ETGB) is a bold new initiative by ICorr, dedicated to shaping the future of professional development in corrosion engineering. It complements ICorr Professional Engineering Institution (PEI) licence, awarded by the Engineering Council (EngC PEI), reinforcing ICorr commitment to delivering internationally recognised, best-in-class training and certification.

ETGB works alongside ICorr Cathodic Protection and Coatings Surface Treatment Training Governing Boards (CPGB/STGB), reporting to the ICorr Council.

ETGB Mission

- Develop and deliver new ICorr-certified and general awareness courses aligned with evolving industry needs
- Provide access routes to ICorr membership via dedicated training programmes
- Strategically manage and expand ICorr global portfolio of engineering courses
- Strengthen branch and international engagement within the corrosion community
- Support ICorr Continuing Professional Development (CPD) programme and Chartership registration

What this means for you

- Access to a broader selection of specialised corrosion-related training and membership pathways
- Curricula aligned with the latest developments, standards, and best practices
- Extensive CPD opportunities towards Chartership and other Certification renewal requirements.
- Resources to deepen your expertise and confidently address complex corrosion challenges

Our ETGB Committee

Meeting monthly, ETGB currently comprises the following members:

- **Tony Rizk (Chair)** – MIC Course Tutor, formerly of Saudi Aramco
- **Sarah Bagnall (Vice Chair)** – ICorr Wales and South-West Branch Chair and Materials course tutor
- **Stephen Tate** – ICorr Immediate Past President and Quality Assurance Co-ordinator
- **Anthony Setiadi** – ICorr Vice President and Chartership Co-ordinator
- **Jane Lomas** – ICorr Fundamentals of Corrosion Engineering (FOCE) Course Tutor
- **George Winning** – Production Chemistry Course Tutor
- **Steve Paterson** – Corrosion Management Course Tutor
- **Roger Francis** – Galvanic Corrosion Course Tutor

Join us

ICorr is committed to delivering best-in-class training that fosters long-term growth, innovation, and resilience across the industry. ETGB is expanding the range of courses available to corrosion professionals - delivered at UK and overseas training sites, in-company, or through global partners - to ensure dynamic and relevant knowledge-sharing worldwide. A recent member survey has highlighted future course development needs within ETGB, which already offers a strong portfolio across corrosion prevention, materials selection, and failure analysis.

Get involved

Let's collaborate to advance corrosion engineering and empower the next generation of experts.

For general enquiries or partnership opportunities, contact: Dr. Tony Rizk, PhD, FICorr, ETGB Chair – **etgbchair@icorr.org**

2 | Our Values

Excellence in Training and Education

We are committed to delivering world class corrosion and materials training, grounded in scientific rigour, practical relevance and the highest professional standards. Our programmes are designed to equip learners with the knowledge, skills and confidence needed to support safe, reliable and sustainable engineering practice across global industries.

Service to the Corrosion Community

As part of ICorr non profit mission, we prioritise knowledge sharing over commercial gain. Our focus is on providing accessible, high quality training that strengthens the global corrosion community, supports professional development at all levels, and advances best practice across sectors.

Civic and Public Engagement

We believe in engaging with the wider civic community to raise awareness of corrosion science, its societal impact, and the importance of prevention. Through outreach, collaboration and knowledge sharing, we aim to inspire future generations and contribute to informed public understanding of materials integrity.

Integrity, Transparency and Professionalism

We uphold the highest standards of integrity in all aspects of our work—from course development to governance and assessment. Our processes are transparent, fair and aligned with ICorr values, ensuring trust and confidence among learners, partners and stakeholders.

Continuous Improvement and Innovation

We are committed to maintaining a continuously upgraded training programme, informed by emerging science, industry needs and global best practice. Through regular review, expert input and constructive feedback, we ensure that our courses remain relevant, modern and technically robust.

Collaboration and Knowledge Sharing

We value collaboration across academia, industry, regulators and professional bodies. By fostering open dialogue and sharing expertise, we strengthen the collective capability of the corrosion community and support ICorr mission to advance the understanding and prevention of corrosion worldwide.

Sustainability and Responsible Practice

We recognise the importance of sustainable engineering and responsible stewardship of materials and infrastructure. Our training promotes approaches that reduce risk, extend asset life, and support environmentally responsible decision making.

3 | Tutors' biographies

The Engineering Training Governing Board (ETGB) is proud to present a distinguished team of ICorr-accredited tutors, each a leading expert in their respective field of corrosion science and engineering. These tutors bring together exceptional academic credentials, predominantly PhD-level qualifications, with decades of combined experience across industry, research, and professional training.

All tutors are active members of the Institute of Corrosion, with the majority holding Fellow status (FICorr), reflecting their sustained contributions to the advancement of corrosion knowledge and practice. Their careers span high-impact roles in industrial innovation, academic research, and workforce development, equipping them to deliver training that is both technically rigorous and practically relevant.

Our tutors are:

- **Highly qualified professionals,** with most holding PhDs in corrosion science, materials engineering, or related disciplines
- **Veteran practitioners**, with long-standing careers in industry, research, and technical leadership
- **Fellows and senior managerial members of the Institute of Corrosion (FICorr),** recognised for their contributions to advancing corrosion knowledge and standards
- **Dedicated educators,** consistently rated highly by trainees for clarity, engagement, and practical relevance
- **Curriculum innovators,** onwards from STEM, committed to keeping ICorr courses aligned with the latest technologies, regulations, standards, and best practices, relevant to technicians, recent graduates, engineers and managers.

ETGB tutors are deeply committed to excellence in education. They consistently receive outstanding feedback from participants and are instrumental in ensuring that ICorr courses remain current with emerging technologies, evolving standards, and best practices. Their teaching not only imparts knowledge—it stimulates discussion and cultivates a highly qualified, safety-conscious, and globally competent corrosion workforce.

Whether delivering foundational training or advanced specialist modules, our ICorr ETGB tutors bring a rare blend of technical rigour, real-world insight, and a passion for developing a skilled, safety-conscious corrosion workforce.

Tutor Profile
Tony Rizk
PhD, FICorr

With over 35 years primarily in the oil and gas sector, Dr. Rizk is a recognised expert in corrosion and industrial microbiology, known for his leadership in MIC diagnostics, asset integrity, and training development.

He served as Honorary Reader at The University of Manchester (2018–2021), fostering collaboration between academia and industry.

Currently, he chairs the ICorr Engineering Training Governing Board (ETGB), driving the development of certified training programmes.

Contact: ETGBchair@icorr.org

As an independent consultant, Dr. Rizk provides high-level advisory services in corrosion management and professional development.

Tutor of the following courses:

- Microbiologically-Influenced Corrosion (MIC), all proficiency levels
- Corrosion at Home and its Prevention (CaH&P)

Tutor Profile
Sarah Bagnall
CEng, FIMMM, MICorr

Sarah is a Materials Engineer and Chartered Engineer specialising in failure analysis particularly for the petrochemical, oil & gas, and power generation industries. With over 1000 failure investigations conducted, Sarah has broad experience with a wide range of engineering components, metallic and nonmetallic materials, and industries. Sarah has extensive expertise in corrosion of a wide range of materials, particularly for the chemical processing and petrochemical industries. Over the last 10 years, Sarah has developed specialist expertise in the corrosion and thermal degradation of austenitic stainless steels. Sarah is also the Chair of the Wales & South West England branch for the Institute of Corrosion and the president of the British Stainless Steel Association (BSSA).

Tutor of the following courses:

- Boiler Materials Failures; Mechanisms, Inspection & Prevention (BMF-MI&P)
- Corrosion Mechanisms in Stainless Steel (CMiSS)
- An Introduction to Failure Analysis (FA-I)

Tutor Profile
Jane Lomas
PhD, FICorr

With over 40 years corrosion experience, primarily as an independent Corrosion Consultant in the fields of Failure Investigation, Coatings and HVAC, Jane has worked across many industries including: buildings & structures (from new build to maintenance and refurbishment); maritime; transport (road vehicles, trains, aeroplanes & ships); insurance & expert witness work on a global basis.

She was Honorary Secretary and Trustee for ICorr for over 14 years and has served on the ICorr governing Council; and committee of the North-West branch of the Institute for over 20 years.

Tutor of the following courses:

- Fundamental of Corrosion Engineering (FOCE) all proficiency levels

Tutor Profile
Steve Paterson
PhD, CEng, MIMMM, MWeldI, MICorr

Granted the 2019 Paul Mcintyre award and made Honorary Fellow of EFC in 2023. He holds a BSc and PhD in metallurgy from Imperial College, London and has over 34 years in a variety of roles with Shell International involving materials, corrosion, welding and integrity management. His experience covered the research, refining, chemical, and oil & gas production sectors and he has worked in the UK, Netherlands, Norway and Malaysia.

Since 2017 Steve has worked as an independent materials and corrosion consultant and was a part-time lecturer at Robert Gordon University in materials & corrosion science and corrosion management 2018-2023.

Tutor of the following course:

- Corrosion Management (CM)

Tutor Profile
Roger Francis
PhD, FAMPP, MIMMM,
TJ Hull Award
Paul McIntyre Award

Fifty years of corrosion engineer with extensive experience in marine corrosion, desalination, oil and gas, chemical and process, power, and mineral processing.

Worked with most corrosion resistant alloys (CRA's) in these environments and has published 7 books on various aspects of corrosion, as well as over 100 technical papers. Roger wrote his book on galvanic corrosion to try and reduce the number of questions he got on the subject; it was only partially successful.

My doctorate was from the University of Manchester, PhD. I am also FAMPP, and MIMMM. I have received the TJ Hull award from AMPP for my work in publishing and the Paul McIntyre Award from ICorr for my work in education and standards.

Tutor of the following courses:

- Galvanic Corrosion (GC)

Tutor Profile
George Winning
FICorr

With over 38 years' experience in industrial corrosion and over 20 years of that with a chemical supplier George has extensive knowledge to share on this specialist subject.

Tutor of the following courses:

- Production Chemistry (PC4CE), all proficiency levels

4 | C.Eng Competency Mapping

The matrix below shows how the ETGB training portfolio aligns with the UK-SPEC Chartered Engineer (CEng) competency framework. Each course contributes to the development of core engineering capabilities through accredited, industry-validated technical training.

Please note: candidates must still be able to demonstrate how they have applied this learning in their work, including their specific role and contributions.

I.Eng/C.Eng Competency Area	How ETGB Courses Contribute	Relevant ETGB Courses
A **Knowledge & Understanding**	● Builds advanced understanding of corrosion science, metallurgy, microbiology, and chemical treatment ● Introduces mechanisms of degradation, materials behaviour, and environmental effects ● Provides foundational and specialist knowledge required for complex engineering decisions	● All ETGB Courses
B **Application to Practice**	● Applies engineering principles to real world corrosion, materials failures, and operational challenges ● Develops competence in root cause analysis, monitoring, diagnostics, and mitigation strategies ● Strengthens practical judgement through case studies and field based examples	● All ETGB Courses
C **Leadership & Decision Making**	● Supports development of corrosion management strategies and integrity leadership ● Enhances decision making through structured evaluation of monitoring data and treatment performance ● Reinforces responsibility for safe, efficient, and compliant operations	● CM ● PC4CE ● MIC ● FOCE
D **Communication & Interpersonal Skills**	● Strengthens ability to communicate technical findings to specialist and non specialist audiences ● Develops structured reporting, data interpretation, and presentation skills ● Encourages collaborative problem solving and cross disciplinary engagement	● PC4CE ● MIC ● Courses with formal certification
E **Professional Commitment & CPD**	● All courses endorsed by ICorr; several endorsed by BSSA ● Formal certification available for selected courses ● Reinforces ethical practice, safety, and responsible engineering judgement ● Delivered by a verified trainer with 10+ years of research and/or field experience, supporting long term workforce development	● All ETGB Courses

Course acronyms used in the competency matrix correspond to the full course titles listed in Sections 5 to 13.

5 | Microbiologically-Influenced Corrosion (MIC)

This intensive course offers a structured, multi-level pathway to mastering Microbiologically Influenced Corrosion (MIC)—from foundational awareness to full professional certification.

Participants may engage at one of three levels:

1. Awareness – One day course, introductory grasp of MIC principles

2. MIC Technologist – Four-day course, practical competence in diagnosis & control

3. ICorr Certified MIC Technologist – Four-day course followed by a certification exam on day five, formal recognition upon passing the certification exam

Delivered through seven focused modules, the course spans the full MIC spectrum—from R&D to field application:

- **Module 1:** Foundations of Corrosion and MIC - Corrosion principles, microbial colonisation, and notable failure cases
- **Module 2**: Microbial Groups and Corrosion Mechanisms - Key microbial groups, metabolic pathways, and material interactions
- **Module 3:** Monitoring, Inspection, and Analytical Techniques - Field protocols and lab methods for MIC assessment
- **Module 4:** Control Strategies and Selection Criteria - Mitigation approaches and implementation guidance
- **Module 5:** Material Susceptibility - MIC effects on metals and MID of non-metallics
- **Module 6:** MIC Identification and Integration into CMS - Recognising MIC indicators and embedding into Corrosion Management Systems
- **Module 7:** Practical Applications and Review - Hands-on training (e.g. MPN method), reporting guidelines, and course recap

Who Should Attend

The course is tailored for professionals with a working knowledge of corrosion or industrial microbiology and a role in asset integrity, system reliability, or corrosion risk management.

Ideal candidates include:

- **Engineers and scientists** with relevant qualifications or applied experience
- **Senior technicians** with 5+ years of MIC-related field or lab involvement
- **Consultants and specialists** in asset protection, system design, failure analysis or inspection
- **R&D professionals** involved in modelling or corrosion mechanism evaluation

- **Managers** overseeing operations, integrity assurance, or risk mitigation

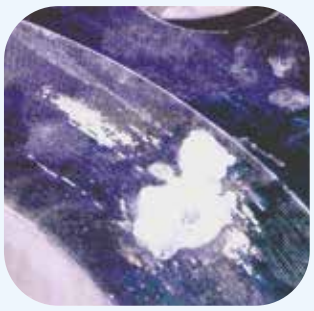
The course is led by Dr Tony Rizk, whose profile is provided on page 6 in Tutors' Biographies.

6 | Fundamentals of Corrosion for Engineers (FOCE)

This intensive course (and exam) offers:

- Awareness – For anyone who works with materials or structures that corrode.
- TICorr – A shorter course and all the corrosion training needed for TICorr application.
- MICorr – All the corrosion training needed for Professional Membership – MICorr application.

Delivered through a series of focused modules, the course spans:



- Module 1: Basic Corrosion principles; types of localized corrosion;
- Module 2: Corrosion under different environments & factors that influence the corrosion.
- Module 3: Corrosion of common metals: steel; stainless steel; galvanizing; aluminium & copper & their alloys.
- Module 4: Basic introduction to Cathodic Protection.
- Module 5: Surface Preparation, Coatings and coating failure.
- Module 6: Corrosion principles at high temperatures; water treatment; concrete.
- Module 7: Design & material selection; maintenance & repair issues.
- Module 8: Failure Investigation; laboratory & site testing.

Who Should Attend

The course is designed to provide attendees with a working knowledge of the principles of corrosion and how to apply them to a wide range of corrosion situations.

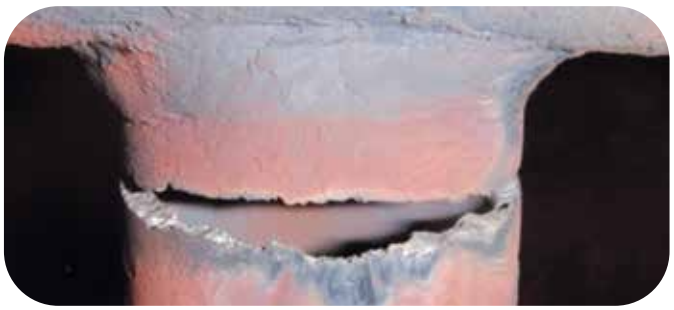
Past attendees have ranged from people with no previous knowledge of corrosion to industry experts.

- Engineers; especially those from Civil, Mechanical and Structural backgrounds who wish to make corrosion-based decisions for structure design, maintenance & refurbishment.
- Architects (land and naval); to understand the implications of material choice and design on potential future corrosion.
- Technical and Sales personnel whose clients are involved in corrosion and who want to help deliver
- Knowledgeable solutions.
- Any person or company who works in a corrosion related industry and would like to be able to apply basic principles of corrosion to a range of situations.
- Those requiring additional CPD, to progress Chartership and other Certifications.
- Anyone who wishes to manage corrosion!

The course is led by Dr Jane Lomas, whose profile is provided on page 7 in Tutors' Biographies.

7 | Boiler Materials Failures; Mechanisms, Inspection & Prevention (BMF-MI&P)

When boiler components fail in service the consequence can have the potential to be catastrophic for human safety & well-being and the environment and / or continuity of operations. On a lower level, the effect of such occurrences can include the requirement to reschedule production, execution of emergency repairs and unplanned outages. The impact of plant failures is undoubtedly negative for plant operators, however, understanding the types of failures that can occur and ways to prevent them is critical to the continual improvement of plant safety, performance, availability, and reliability, whilst reducing maintenance costs.



With over 1,000 failure investigations conducted, R-TECH Materials have an extensive library of case studies across a wide range of materials, failure mechanisms and applications. Attendees will gain the necessary understanding of what can go wrong in boilers, ways to inspect them and ways to ensure that correct actions are put in place to avoid failures. Attendees will also develop the knowledge of identifying failure mechanisms, including:

Waterside mechanisms: water- and steam-formed deposits, caustic embrittlement, chloride stress corrosion cracking, caustic gouging, hydrogen embrittlement, acid phosphate corrosion, oxygen corrosion, microbiologically influenced corrosion (MIC), CO_2corrosion, nitrate stress corrosion cracking, and erosion corrosion.

Fireside mechanisms: graphitisation, spheroidisation, sigma phase embrittlement, sensitisation, creep and stress rupture, short-term overheating, decarburisation, stress relaxation cracking, acid dewpoint corrosion, polythionic acid stress corrosion cracking, fuel-ash corrosion, fire-side erosion, and high-temperature alkali salts corrosion.

General / other mechanisms: thermal fatigue, corrosion fatigue, welding defects, corrosion under insulation, liquid metal embrittlement, temper embrittlement, incorrect materials or defects, and repair-related issues.

For each mechanism, participants will learn: A description of the failure and critical contributing factors, how to identify the mechanism in service, locations and material types affected, recommendations for prevention, inspection, and monitoring, real-world case studies illustrating the mechanism.

The course is led by Sarah Bagnall, whose profile is provided on page 6 in Tutors' Biographies.

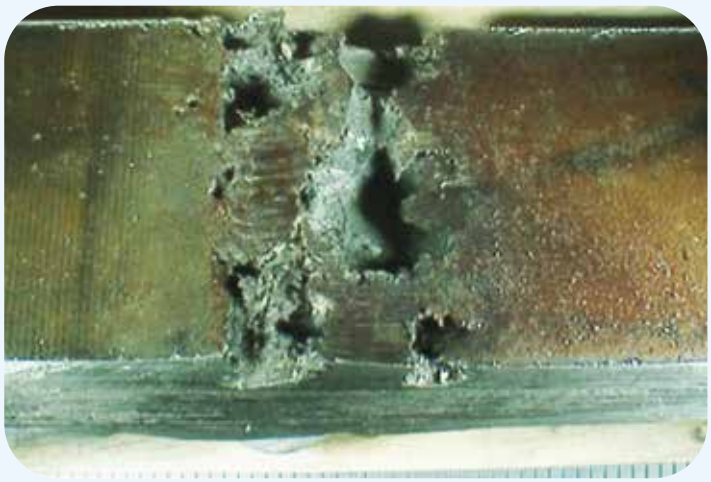
8 | Corrosion Mechanisms in Stainless Steels (CMiSS)

This course provides a comprehensive exploration of the corrosion mechanisms that affect stainless steels, offering participants a detailed understanding of how these materials perform in service and how to mitigate corrosion risks.

It begins with an introduction and an overview of stainless steel, followed by foundational concepts of corrosion and sensitisation, before moving into specific phenomena such as tea staining, rouging, general/uniform corrosion, pitting corrosion, selective attack, chloride stress corrosion cracking, high temperature corrosion, polythionic acid stress corrosion cracking, microbial corrosion, crevice corrosion, corrosion under insulation, hydrogen-induced stress cracking, galvanic corrosion, caustic stress corrosion cracking, erosion corrosion, and corrosion fatigue.

For each mechanism, the course covers:

- A clear description of the failure mechanism and critical factors.
- Guidance on how to identify the mechanism in service.
- Typical locations affected within industrial applications.
- Material types most susceptible to the mechanism.
- Recommendations for prevention, including inspection, monitoring, and mitigation strategies.
- Practical case studies illustrating the mechanism and lessons learned.



Drawing on extensive failure analysis experience in the petrochemical, chemical processing, and power generation industries, the course includes practical examples that link theory to real-world scenarios.

Participants who successfully complete this course will be awarded a CPD-approved certificate of completion.

The course is led by Sarah Bagnall, whose profile is provided on page 6 in Tutors' Biographies.

9 | An Introduction to Failure Analysis (FA-I)

This course provides a comprehensive introduction to the principles and practice of materials failure analysis, focusing on understanding why engineering components fail and how to prevent failures in service. Participants will explore a wide range of failure mechanisms, including corrosion, fatigue, wear, embrittlement, creep, thermal damage, and manufacturing-related defects.

The course covers:

- Identification of failure mechanisms and understanding their root causes.
- Inspection and monitoring techniques to detect early signs of failure.
- Practical case studies illustrating real-world failures and lessons learned.
- The impact of material properties, design, processing, and operating conditions on component performance.

Strategies for prevention, mitigation, and repair, improving component reliability and safety.

Who should attend

Engineers, designers, quality engineers, manufacturers, fabricators, technical managers, inspection engineers, materials scientist, metallurgists, maintenance engineers.

Participants who successfully complete this course will be awarded a CPD-approved certificate of completion.

The CPD certificate:

- Confirms participation and learning in materials failure analysis principles and practice.
- Demonstrates commitment to continuous professional development.
- Enhances credibility within engineering and maintenance teams.
- Provides evidence of training for career development and improved decision-making in materials, reliability, and asset management.

- Supports participants in taking a proactive role in assessing, mitigating, and preventing failures.

The course is led by Sarah Bagnall, whose profile is provided on page 6 in Tutors' Biographies.

10 | Corrosion at Home and its Prevention (CaH&P)

Corrosion isn't just an industrial problem—it's a hidden household hazard. This course raises awareness of corrosion in everyday environments and equips participants with practical, common sense methods to identify, manage, and prevent it using simple household items.

Covering a wide range of domestic systems and materials, the course examines corrosion risks in:

- **Batteries** - electronics and leakage issues.
- **Electrical systems** - wiring, sockets, circuit boards.
- **Garage & shed** - tools, storage units, exposed surfaces.
- **Garden furniture & outdoor fixtures** - moisture and pollutant exposure.
- **House components** - windows, doors, roofing, structural metals.
- **Kitchen** - cookware, cutlery, appliances, food contact materials.
- **Sports equipment** - bicycles, gym gear, metal accessories.
- **Vehicles** - bodywork, undercarriage, battery terminals.
- **Water systems** - pipes, taps, boilers, heating units.

Participants learn how corrosion affects safety, reliability, cost, and appearance—and how simple preventive actions can extend asset life, preserve value, and avoid avoidable incidents.

The course also provides guidance on:

- Selecting safe cooking materials to avoid toxic metal exposure or degraded coatings.
- Using everyday items (e.g., vinegar, baking soda, protective coatings) for corrosion control.
- Recognising early signs of corrosion and applying low cost interventions.

Corrosion is also an aesthetic issue, capable of staining surfaces, tarnishing materials, and reducing the value of household items.

Who Should Attend

Ideal for anyone seeking to protect their home, health, and assets from corrosion risks, including:

- **Professional educators** - promoting science awareness and safety.
- **Local government and housing authorities** - supporting public maintenance initiatives.
- **Community employees and volunteers** - sharing practical solutions.
- **Media professionals** - covering safety, sustainability, and consumer protection.
- **Homeowners, tenants, and DIY enthusiasts** - reducing costs and extending asset life.
- **Public health and safety advocates** - concerned with exposure to degraded materials.

Whether you work in education, outreach, reporting, or simply want to make informed choices at home, this course offers practical, accessible insights that can save money—and prevent harm.

The course is led by Dr Tony Rizk, whose profile is provided on page 6 in Tutors' Biographies.

11 | Corrosion Management (CM)

This interactive three-day course provides the basis for understanding systematic management of corrosion in relation to wider asset integrity management. It describes the strategies and tools required to implement an effective corrosion management system. Whilst designed primarily for professionals in the oil and gas industry the principles can be applied to any industry sector where corrosion is a significant factor. Participants will benefit from an appreciation of the influence of corrosion prevention and control in creating a more efficient approach to monitoring and management of asset integrity and inspection.

Key Learning Areas:

- Fundamentals of systematic corrosion and integrity management.
- Important factors and benefits for systematic corrosion management.
- Tools required to implement a corrosion management system.
- Broader aspects and implications of corrosion management.

Delivered through a structured lecture programme, the course includes interactive case studies exercises to reinforce learning from the formal presentations and expert insights from seasoned industry professionals, highlighting common challenges and best practices.

Modules include:

1. Principles of Corrosion Management	2. Corrosion Management Models	3. Corrosion Management Strategy
4. Corrosion Risk Assessment	5. Corrosion Threats Assessment	6. Corrosion Threats Mitigation
7. Performance Measurement	8. Review and Audit	9. Asset Life Extension
10. Human Factors and Legislation	11. Investigation and Continuous Improvement	12. Application of Corrosion Management
13. Participants Case Studies		14. Course Overview & Close

Examination:

The course delivery will be supplemented by an exam that will test understanding of the course content. Participants who successfully complete this course will be awarded a CPD-approved certificate of completion.

Who Should Attend

- Experienced and young engineering professionals either engaged in materials, corrosion, inspection, quality and asset integrity activities, or planning to broaden their expertise into this area.
- Production, Operations, Maintenance, Structural, Pipeline, Process or Technical Safety engineers looking to enhance their knowledge of and interface with systematic corrosion management.
- Managers and supervisors wishing to develop or improve systematic asset integrity management capability in their organisation.

The course is led by Dr. Steve Paterson, whose profile is on page 7 in the Tutors' Biographies.

12 | Galvanic Corrosion (GC)

The half day course consists of four short modules as follows:

1. Introduction to galvanic corrosion: what it is; what factors are important; what environmental conditions do. This will address potentials in waters, the effect of area ratio, cathodic efficiency, fluid conductivity, temperature, and the other factors that control the severity of galvanic corrosion. Examples will be shown to demonstrate the effect of these factors on service failures.

2. Galvanic corrosion in waters: Mostly looking at seawater, but also showing how fresh water is different, because of its reduced conductivity and chloride content. This will show that materials in both seawater and fresh waters can be placed in groups, and all alloys within a group can be safely 'connected together'. Examples of successes and failures.

3. Galvanic corrosion in the atmosphere: Atmospheric aggressivity; ISO 9223 and the factors that control atmospheric aggressivity rankings (C1 to C5), Effect of aggressivity on stainless steels; Area ratio often 1:1 in the atmosphere and the effect of this on the severity of galvanic corrosion. Diagrams showing which alloys may be 'connected together' safely in different atmospheres. Some successes and failures.

4. Preventing galvanic corrosion: Importance of design; selection of materials, how to minimise galvanic corrosion risk; area ratio; inhibitors; coatings. Separation of anode and cathode, and potential problems; Examples of where these have been addressed correctly and examples of where they have not.

Key learning Areas:

- The important parameters that control the severity of galvanic corrosion
- What materials can be safely connected together in different environments
- What the practical remedies are to control or prevent galvanic corrosion

Who should attend

- Experienced and young engineering professionals either engaged in materials, corrosion, inspection, quality and asset integrity activities, or planning to broaden their expertise into this area.
- Designers and engineers involved with proprietary equipment that may be made of different materials
- Managers and supervisors wishing to improve their knowledge and understanding of why alloy changes may need to be made to improve reliability.

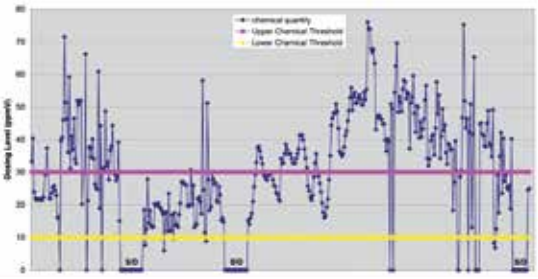
The course is led by Dr. Roger Francis, whose profile is on page 8 in the Tutors' Biographies.

13 | Production Chemistry for Corrosion Engineers (PC4CE)

This intensive four day course provides a structured introduction to production chemistry for corrosion engineers and oil and gas professionals, with relevance to related industries such as water treatment. It covers the full chemical lifecycle, from sampling and fluid characterisation to chemical selection, testing, optimisation, and deployment. **The course combines theory with practical field examples, with a strong focus on production chemistry challenges that influence corrosion and asset integrity.**

Key Learning Areas:

- **Field Sampling & Analysis –** Techniques for collecting and interpreting field and laboratory data.
- **Chemical Selection –** Identifying and recommending appropriate chemical treatments.
- **Application & Delivery –** Understanding injection systems, pumps, and delivery mechanisms to ensure optimal chemical performance.



Delivered through a structured lecture programme, the course features real-world case studies and expert insights from seasoned industry professionals, highlighting common challenges and best practices.

Modules include:

1. Introduction to Production Chemistry– What is it?	2. Fluid Separation & Water Management	3. Chemical Types in Production
4. Multiphase Flow	5. Asphaltene Control	6. Hydrate Control
7. Wax Control	8. Scale Control	9. Fluid Sampling
10. Corrosion Control	11. Other Technologies	12. Chemical Injection
13. The Future of Chemistry – Including Legislation		14. Course Overview & Close

An optional exam and certification will be available for those seeking formal recognition of their learning.

Future course levels will allow participants to specialize in key areas, supporting their progression toward becoming experts in production chemistry.

Who Should Attend

The full course is ideal for professionals involved in fluid handling, chemical application, and integrity assurance, including:

- Engineers and scientists with relevant qualifications or applied experience
- Senior technicians with 5+ years of field or laboratory experience
- Consultants and specialists in asset protection, system design, failure analysis, or inspection
- R&D professionals involved in modelling or corrosion mechanism evaluation
- Managers overseeing operations, integrity assurance, or risk mitigation

The course is led by George Winning, whose profile is provided on page 8 in the Tutors' Biographies.

14 | ETGB Course Registration and Delivery

ETGB delivers regular, high quality training courses across multiple locations in the United Kingdom including ICorr HQ in Northampton, as well as directly at company premises worldwide. Delivering courses on site for groups of employees is often the most cost effective and operationally efficient option, reducing travel and accommodation costs while ensuring consistent, standardised training for entire teams.

All course fees are carefully set in line with ICorr non profit ethos and ETGB's mission to support industry, advance best practices in corrosion prevention, and strengthen the global corrosion community. Our pricing model ensures technically robust, accessible, and fair training for organisations of all sizes. Group discounts are available to further support workforce development across sectors.

All participants receive an attendance certificate. Those seeking formal ICorr Certification must successfully pass the relevant examination at the end of the course, in accordance with ICorr established certification standards.

Cancellation Policy

UK based courses

- A full refund is available for cancellations received more than 2 weeks before the course date.
- For less than 2 weeks, refunds cannot be offered; however, participants may transfer to the next scheduled course at no additional cost.

Overseas and on site company courses

- Cancellations must be received at least 4 weeks before the course date.
- Any non recoverable expenses already incurred (e.g., travel bookings, venue hire, logistics) will be deducted from the refundable amount.
- This policy ensures fairness, transparency, and responsible management of ETGB resources while maintaining our commitment to high quality global delivery.

Contact and Registration

For further details or to register interest, please contact: Dr Tony Rizk – ETGB Chair ETGBchair@icorr.org

INSTITUTE OF CORROSION

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