COURSE OVERVIEW FE0017-4D
Advanced Welding

Course Title
Advanced Welding

Course Date/Venue
August 12-15, 2024/BoardRoom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference
FE0017-4D

Course Duration/Credits
Four days/2.4 CEUs/24 PDHs

Course Description

This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt in the class will be applied using the following practical methods: -

(**1**) **Industrial Facility Visit:** Course participants will be taken to an industrial facility where they will practice welding, fabrication and inspection. In case that this course is organized inside client premises (In-House), then client shall provide access to its welding and fabrication workshop for practical sessions.

(**2**) **Welding Simulator:** Participants will use in the class the welding & fabrication software and AWS Tool Kit & Structural Weld Replica Kit to practice some of the skills learnt.

Welding Technology plays a major role in all maintenance and fabrication activities in the industry. Production equipment, a highly sophisticated welding technique and qualified personnel allow processing or production of steel products for different applications within short periods. This course provides a much-needed source of authoritative information on the complex subject of welding. It provides a comprehensive run-down of the complex science of welding- processes, selection of power sources, weld metallurgy, weldability of metals, testing and inspection techniques.

This course is designed to provide participants with a detailed and up-to-date overview of Advanced Welding. It covers the applications of advanced welding techniques; the challenges, benefits, relevant standards and codes; the gas tungsten arc welding (GTAW), gas metal arc welding (GMAW), flux-cored arc welding (FCAW), submerged arc welding (SAW), laser beam welding (LBW) and electron beam welding (EBW) processes as well as welding equipment and setup; selecting and preparing tungsten electrode, shielding gases, wire electrodes and flux-cored electrodes; the welding techniques and parameter optimization; the parameters, applications, limitations, considerations and advantages of GTAW, GMAW, FCAW, SAW, LBW and EBW; and the techniques for achieving high deposition rates and controlling beam intensity and penetration.

During this interactive course, participants will learn the welding parameters for different applications and joint design considerations of SAW; the inspection techniques for advanced welding, non-destructive testing methods and post-weld heat treatment considerations; the weld defects evaluations and discontinuities; the quality control measures and documentation; the welding metallurgy principles, effects of welding on material properties and selecting base metals and filler materials; the joint design considerations for advanced welding techniques and microstructural analysis and heat-affected zone (HAZ) control; the advanced welding applications in specific industries; the welding automation and robotics; and the emerging trends and future developments in advanced welding.

Course Objectives

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

- Apply and gain an advanced knowledge on welding
- Discuss the applications of advanced welding techniques including the challenges, benefits, relevant standards and codes
- Carryout gas tungsten arc welding (GTAW), gas metal arc welding (GMAW), flux-cored arc welding (FCAW), submerged arc welding (SAW), laser beam welding (LBW) and electron beam welding (EBW) processes as well as welding equipment and setup
- Select and prepare tungsten electrode, shielding gases, wire electrodes and flux-cored electrodes
- Discuss welding techniques and parameter optimization as well as the parameters, applications, limitations, considerations and advantages of GTAW, GMAW, FCAW, SAW, LBW and EBW
- Apply the techniques for achieving high deposition rates and controlling beam intensity and penetration
- Optimize welding parameters for different applications and discuss joint design considerations of SAW
- Employ inspection techniques for advanced welding, non-destructive testing methods and post-weld heat treatment considerations
- Evaluate weld defects and discontinuities and implement quality control measures and documentation
- Explain welding metallurgy principles, effects of welding on material properties and select base metals and filler materials

- Carryout joint design considerations for advanced welding techniques and microstructural analysis and heat-affected zone (HAZ) control
- Apply advanced welding applications in specific industries and determine welding automation and robotics including the emerging trends and future developments in advanced welding

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 advanced welding for professional welders, welding inspectors, engineering professionals and those who wish to enhance their skills and expand their understanding of advanced welding methods.

Course Fee

US$ 4,500 per Delegate. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

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 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: -

- 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 **2.4 CEUs** (Continuing Education Units) or **24 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.

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. Mohamed Kader (**FE**), BSc, PgDip, PMI-PMP, NDT, CSWIP, API is a **Senior Inspection Engineer** with over **20 years** of practical experience within the **Oil & Gas**, **Petrochemical** and **Refinery industries**. His expertise widely covers in the areas of **Tank Repairs**, **Design**, **Fabrication**, **Construction**, **Installation**, **Commissioning**, **Inspection & Maintenance** of **Process Equipment**, **Aboveground Storage** Tank Inspection, **Tank Repair**, **Alteration & Reconstruction**, **Tank & Vessels** Inspection, Repair & Modification, **Pressure Vessels** Inspection, **Steam Generator** Repair, **Boilers**, **Piping** Systems, **Pipeline** Operation & Maintenance, **Pipeline** Systems, **Pipeline** Design & Construction, **Pipeline** Inspection & Rehabilitation, **Corrosion**, Fitness for Service (**FFS**), Risk Based Inspection (**RBI**), **Integrity** Management, **Pipeline** Rehabilitation & Repair, **Pipeline** Design & Maintenance, **Pipeline Integrity** Assessment, **Corrosion Monitoring & Cathodic Protection**, **Pressure & Leak** Testing, Piping Inspection, Pipe Lines, Piping Fabrication, Pipe Flow, Gas Pipe Line, Non-Destructive Testing & Engineering Materials, NDT Methods & Application, Magnetic Particle Inspection & Testing, Radiographic Inspection & Testing, Visual Inspection, Leak Testing, Cathodic Protection, Welding Inspection, Welding Technology, Welding & Fabrication, Welding Defects Analysis, Welding Engineering, Welding Procedure Specification, Welding Quality & Control, Damage Mechanisms, Pressure Vessels, Tanks, Heat Exchangers, RT Films Interpretation, Fire Heaters Revamping, Waste Water Heater, Distillation Towers, Crude Oil Tank, Steam Power Plant, Spherical Tanks and Asset Integrity Management. Further, he is also well-versed in **Contract** Management & Administration, **Project** Management, **Project** Scheduling & Cost Control, **Project** Supervision, **Project** Reporting, **Project Investment** & **Risk Analysis**, **Project** Delivery & Governance Framework, **Project Risk** Management, **Risk** Identification Tools & Techniques, **Project** Life Cycle, **Project Stakeholder** & **Governance**, **Project Time** Management, **Project Cost** Management, **Project Quality** Management and **Quality** Assurance. He is currently the **Project Manager** of SOPCO wherein he is managing the project team, evaluating projects and ensuring that the projects meet the quality standards.

During his career life, Mr. Mohamed occupied several significant positions and dedication as the **Projects Engineer**, **Piping & QC Leader**, **Piping Engineer**, **QA/QC Engineer** and **Senior Trainer/Instructor** for various international companies like the Gulf of Suez Petroleum Company (GUPCO), Khalda Petroleum Company (KPC), ADMA-OPCO, Kahalda Petroleum Company, East Gas and MASSA Inspection and Consultation Company.

Mr. Mohamed has a **Bachelor's** degree in **Mechanical Power Engineering** and a **Postgraduate Diploma** in **Welding Science & Technology**. Further, he is a **Certified Instructor/Trainer**, a **Certified Project Management Professional** (**PMI-PMP**), a **Certified Senior Welding Inspector** (**CSWIP 3.1**), a **Certified API 510 Pressure Vessel Inspector**, a **Certified API 570 Piping Inspector**, a **Certified API 653 Tank Inspector** and a **Certified NDT Level II Inspector** in Radiographic Testing (**RT**), Ultrasonic Testing (**UT**), Magnetic Particle Testing (**MT**) and liquid Penetrant Testing (**PT**). He has further delivered numerous trainings, courses, seminars, conferences and workshops internationally.

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: ***Monday, 12th of August 2024***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0900	***Advanced Welding Techniques*** *Advanced Welding Techniques & their Applications ● Challenges & Benefits of Welding Processes ● Advanced Welding in Various Industries ● Relevant Standards & Codes*
0900 - 0930	***Gas Tungsten Arc Welding (GTAW)*** *In-Depth Understanding of GTAW Process ● Welding Equipment & Setup*
0930 – 0945	*Break*
0945 – 1100	***Gas Tungsten Arc Welding (GTAW) (cont'd)*** *Tungsten Electrode Selection & Preparation ● Welding Parameters & Techniques Applications & Limitations of GTAW*
1100 – 1215	***Gas Metal Arc Welding (GMAW)*** *GMAW Process ● Welding Equipment & Setup ● Selection of Shielding Gases & Wire Electrodes*
1215 – 1230	*Break*
1230 – 1420	***Gas Metal Arc Welding (GMAW) (cont'd)*** *Welding Techniques & Parameter Optimization ● Advanced GMAW Variations (Pulse GMAW, Spray Transfer, etc.).*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2: ***Tuesday, 13th of August 2024***

0730 – 0830	***Flux-Cored Arc Welding (FCAW)*** *FCAW Process & its Variations ● Welding Equipment & Setup ● Selection of Flux-Cored Electrodes & Shielding Gases ● Techniques for Achieving High Deposition Rates ● Applications & Considerations for FCAW*
0830 - 0930	***Submerged Arc Welding (SAW)*** *Introduction to SAW Process ● Welding Equipment & Setup ● Flux Selection & Preparation*
0930 – 0945	*Break*
0945 – 1100	***Submerged Arc Welding (SAW) (cont'd)*** *Optimization of Welding Parameters for Different Applications ● Joint Design Considerations for SAW*
1100 – 1215	***Laser Beam Welding (LBW)*** *Principles of Laser Beam Welding ● Laser Welding Equipment & Setup ● Laser Source Selection & Characteristics*
1215 – 1230	*Break*
1230 – 1420	***Laser Beam Welding (LBW) (cont'd)*** *Welding Techniques & Parameter Optimization ● Applications & Advantages of Laser Beam Welding*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3: Wednesday, 14th of August 2024

0730 – 0930	***Electron Beam Welding (EBW)*** *Electron Beam Welding Process ● Electron Beam Welding Equipment & Setup ● Electron Beam Generation & Focusing*
0930 – 0945	*Break*
0945 – 1100	***Electron Beam Welding (EBW) (cont'd)*** *Techniques for Controlling Beam Intensity & Penetration ● Applications & Considerations for Electron Beam Welding*
1100 – 1215	***Advanced Welding Inspection & Quality Control*** *Inspection Techniques for Advanced Welding ● Non-Destructive Testing Methods (Radiography, Ultrasonic Testing, etc.) ● Post-Weld Heat Treatment Considerations*
1215 – 1230	*Break*
1230 – 1420	***Advanced Welding Inspection & Quality Control (cont'd)*** *Evaluation of Weld Defects & Discontinuities ● Quality Control Measures & Documentation*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

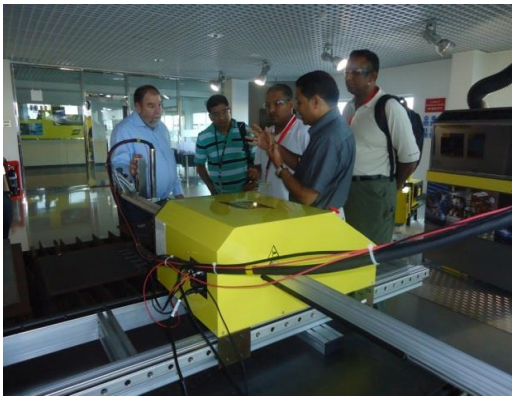
Day 4: Thursday, 15th of August 2024

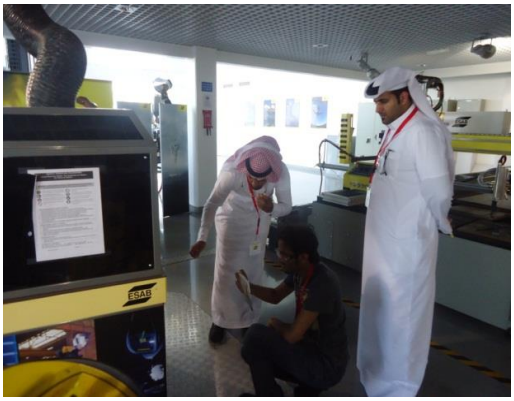
0730 - 0930	***Welding Metallurgy & Joint Design*** *Welding Metallurgy Principles ● Effects of Welding on Material Properties ● Selection of Base Metals & Filler Materials*
0930 – 0945	*Break*
0945 – 1100	***Welding Metallurgy & Joint Design (cont'd)*** *Joint Design Considerations for Advanced Welding Techniques ● Microstructural Analysis & Heat-Affected Zone (HAZ) Control*
1100 – 1215	***Advanced Welding Applications & Future Developments*** *Advanced Welding Applications in Specific Industries (Aerospace, Automotive, Energy, etc.) ● Welding Automation & Robotics*
1215 – 1230	*Break*
1230 - 1345	***Advanced Welding Applications & Future Developments (cont'd)*** *Emerging Trends & Future Developments in Advanced Welding ● Case Studies of Innovative Welding Projects ● Discussion on the Future of Advanced Welding*
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions/Site Visit

Site visit will be organized during the course for delegates to practice the theory learnt

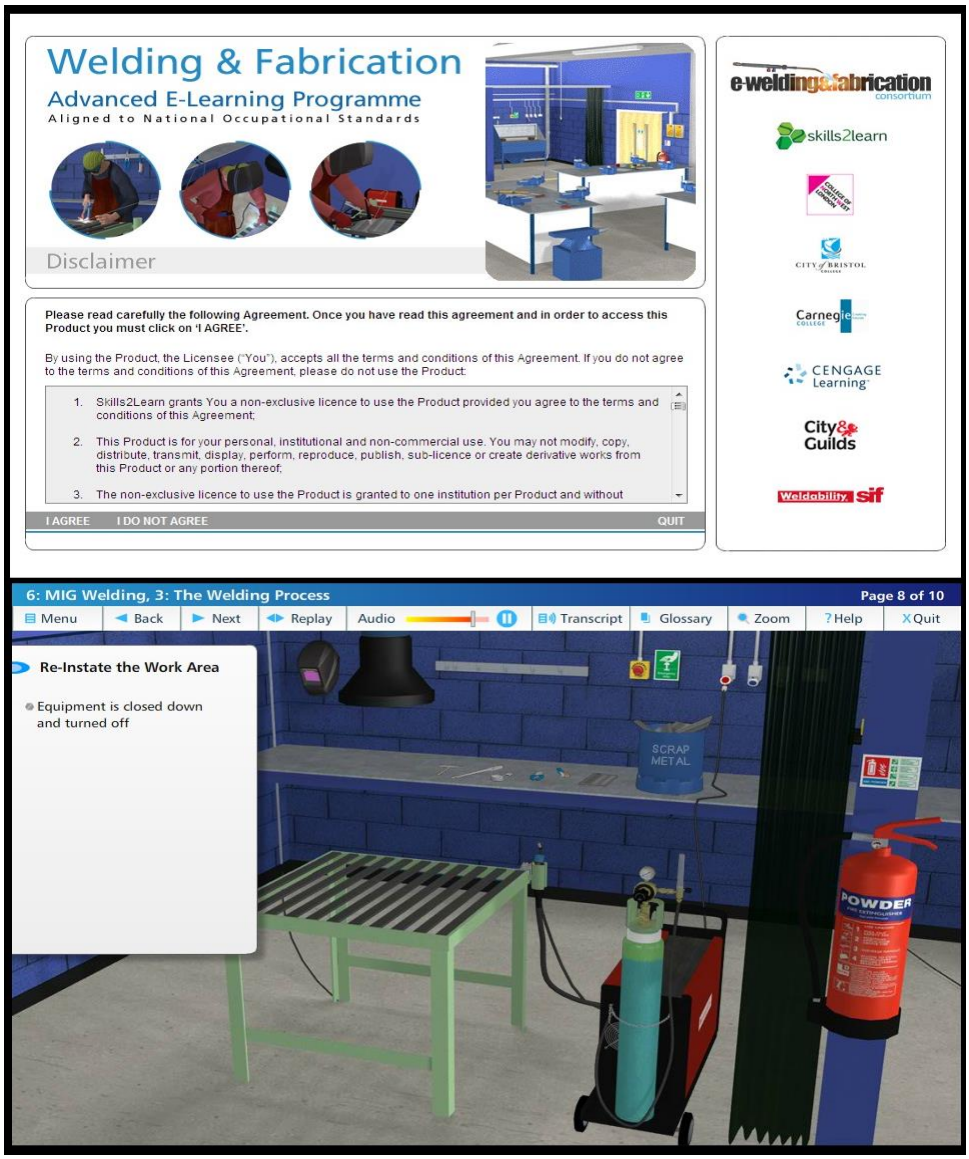




Simulator (Hands-on Practical Sessions)

Practical session 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 simulator "E-Welding & Fabrication", "AWS Tool Kit", "Structural Weld Replica Kit"



E-Welding & Fabrication

AWS Tool Kit

Structural Weld Replica Kit

Course Coordinator
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