COURSE OVERVIEW FE0112

Electric Arc Welding and Oxy-Acetylene Gas Cutting

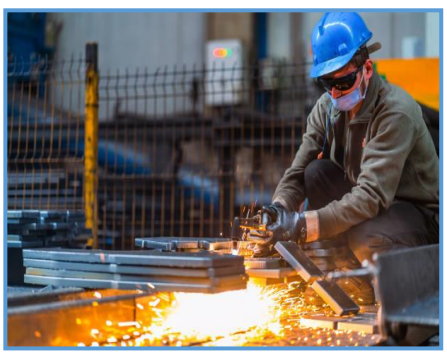
Course Title
Electric Arc Welding and Oxy-Acetylene Gas Cutting

Course Date/Venue
August 10-14, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference
FE0112

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 Electric Arc Welding and Oxy-Acetylene Gas Cutting. It covers the applications of welding and cutting including the types of welding processes and the importance of oxy-acetylene gas cutting in industries; the personal protective equipment (PPE) for welding and cutting, fire hazards and fire extinguishers and safe handling and storage of gas cylinders; the various types of electric arc welding, equipment and tools used in electric arc welding and the role of electrodes and selection criteria; the working principle of oxy-acetylene gas cutting; and the difference between welding and cutting, components of the oxy-acetylene gas cutting system and gas properties.

Further, the course will also discuss how to assemble welding machine and cables, and setting-up oxy-acetylene torch and regulators, checking gas leaks and adjusting pressures for welding and cutting; the electric arc welding techniques, control heat input and travel speed; the common defects in welding and how to avoid them; the types of oxy-acetylene flames covering neutral flame, oxidize flame and carburize flame; cleaning and preparing surfaces for welding or cutting, removing rust, paint, and grease and marking and measuring workpieces; classifying electrodes, selecting the right electrode and storage and handling electrodes; and the effects of electrode angle on weld quality.

During this interactive course, participants will learn the gas cutting techniques and welding joint types; the effects of excessive heat on metal properties, managing heat input for different thicknesses and preheating and post-heating techniques; the advanced cutting methods and common welding and cutting defects, welding positions and challenges, and welding metal types; fixing weld cracks, improving bead uniformity and penetration, addressing undercut and overlapping issues and avoiding warp and distortion; the proper techniques for cutting thin and thick plates, adjusting torch settings for non-ferrous metals and managing slag in different materials; the visual inspection of welds, destructive and non-destructive testing methods, codes and standards for weld quality and documentation of weld inspection results; cleaning and maintaining welding machines, checking cables, electrodes, and clamps, and the preventative maintenance schedules; the welding procedures and documentation; the advanced gas cutting applications, specialized welding techniques, cost analysis of consumables and energy use; and reducing waste in welding and cutting processes

Course Objectives

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

- Apply and gain an in-depth knowledge on electric arc welding and oxy-acetylene gas cutting
- Discuss the applications of welding and cutting including the types of welding processes and the importance of oxy-acetylene gas cutting in industries
- Identify personal protective equipment (PPE) for welding and cutting, fire hazards and fire extinguishers and safe handling and storage of gas cylinders
- Recognize various types of electric arc welding, equipment and tools used in electric arc welding and the role of electrodes and selection criteria
- Explain the working principle of oxy-acetylene gas cutting and identify the difference between welding and cutting, components of the oxy-acetylene gas cutting system and gas properties
- Assemble welding machine and cables, set-up oxy-acetylene torch and regulators, check gas leaks and adjust pressures for welding and cutting
- Apply electric arc welding techniques, control heat input and travel speed, and identify the common defects in welding and how to avoid them
- Identify types of oxy-acetylene flames covering neutral flame, oxidize flame, and carburize flame
- Clean and prepare surfaces for welding or cutting, remove rust, paint, and grease and mark and measure workpieces
- Classify electrodes, select the right electrode, storage and handle electrodes and identify the effects of electrode angle on weld quality
- Apply gas cutting techniques and welding joint types comprising of butt joint, lap joint, T-joint, and corner joint
- Recognize the effects of excessive heat on metal properties, manage heat input for different thicknesses and apply preheating and post-heating techniques

- Apply advanced cutting methods and identify the common welding and cutting defects, welding positions and welding metal types
- Identify and fix weld cracks, improve bead uniformity and penetration, address undercut and overlap issues and avoid warp and distortion
- Carryout proper techniques for cutting thin and thick plates, adjust torch settings for non-ferrous metals and manage slag in different materials
- Apply visual inspection of welds, destructive and non-destructive testing methods, codes and standards for weld quality and documentation of weld inspection results
- Clean and maintain welding machines, check cables, electrodes and clamps and apply preventative maintenance schedules
- Review welding procedures and documentation and carryout advanced gas cutting applications, specialized welding techniques, cost analysis of consumables and energy use and reducing waste in welding and cutting processes

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 electric arc welding and oxy-acetylene gas cutting for aspiring welders, engineers and technicians, skilled tradespeople, safety personnel and other technical staff.

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.

Accommodation

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

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 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.

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 & Welding Engineer** with over **45 years** of extensive experience within the **Oil & Gas**, **Petrochemical, Refinery**, **Construction**, **Aircraft & Shipbuilding** Industry. His wide experiences covers in the areas of **Welding** & **Cutting**, **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 & Cold Tapping** Techniques, **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, **Metallurgy Techniques**, **Metallurgical** Failure Analysis & Prevention, **Corrosion** Fabrication & Inspection, **Fabrication** & **Repair**, **Corrosion** Prevention, **Corrosion** Engineering, **Oilfield Corrosion Monitoring & Control**, **Corrosion Inhibition**, **Corrosion** Management in Process Operations, **Corrosion** & Prevention of Failures, **Material** Selection, **Cathodic Protection** Systems. Further, he is also well-versed in **Hot Rolling** Process, **Hot Strip Mill**, **Mill** Operations, **Roll Mill**, **Steel Making** Process, **Steel** Manufacturing, **Electric Arc Furnace** (**EAF**), **Steel Forging**, **Steel** Manufacturing & Process Troubleshooting, **Slit Rolling**, **Carbon Steel Pipe** Wall Thickness & Grade Selection, **Ferro-Alloys**, **Steel Metallurgy**, **Steel** Structure Welding, **Steelmaking** Slag, **Steel** Making Application, **Heat Treatment** & **Prevention Techniques**, **Corrosion** Fabrication & Inspection and **Post Weld Heat Treatment**.

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.

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: ***Sunday, 10th of August 2025***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Overview of Welding & Cutting*** *Definition & Applications of Welding & Cutting • Types of Welding Processes: Arc Welding, MIG, TIG, Etc • Importance of Oxy-Acetylene Gas Cutting in Industries • Career Opportunities in Welding & Cutting*
0930 - 0945	*Break*
0945 – 1045	***Safety Precautions & Workshop Rules*** *Personal Protective Equipment (PPE) for Welding & Cutting • Fire Hazards & Fire Extinguishers • Importance of Ventilation in the Workshop • Safe Handling & Storage of Gas Cylinders*
1045 - 1145	***Basics of Electric Arc Welding*** *Definition & Principle of Electric Arc Welding • Types of Electric Arc Welding: AC Vs. DC • Equipment & Tools Used in Electric Arc Welding • Role of Electrodes & Selection Criteria*
1145 - 1230	***Oxy-Acetylene Gas Cutting*** *Definition & Working Principle • Difference Between Welding & Cutting • Components of the Oxy-Acetylene Gas Cutting System • Gas Properties: Oxygen & Acetylene Characteristics*
1230 – 1245	*Break*
1245 – 1330	***Setting Up Equipment*** *Assembling the Welding Machine & Cables • Setting Up the Oxy-Acetylene Torch & Regulators • Checking for Gas Leaks & Troubleshooting • Adjusting Pressures for Welding & Cutting*
1330 - 1420	***Hands-On Practice: Basic Equipment Handling*** *Proper Handling of Welding Torches & Tools • Lighting & Shutting Down the Oxy-Acetylene Flame • Striking an Arc & Maintaining a Stable Arc • Practicing Hand-Eye Coordination for Welding*
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	*End of Day One*

Day 2: ***Monday, 11th of August 2025***

0730 – 0830	***Electric Arc Welding Techniques*** *Fillet Welding & Groove Welding Basics • Welding Positions: Flat, Horizontal, Vertical, & Overhead • Controlling Heat Input & Travel Speed • Common Defects in Welding & How to Avoid Them*
0830 – 0930	***Types of Oxy-Acetylene Flames*** *Neutral Flame: Characteristics & Applications • Oxidizing Flame: When & Why it's Used • Carburizing Flame: Identification & Uses • Adjusting Flame Settings for Different Metals*
0930 - 0945	*Break*

0945 – 1100	***Base Metal Preparation*** *Cleaning & Preparing Surfaces for Welding or Cutting • Removal of Rust, Paint, & Grease • Importance of Proper Joint Design • Marking & Measuring Workpieces*
1120 - 1230	***Welding Electrodes*** *Classification of Electrodes (e.g., E6013, E7018) • Selecting the Right Electrode for the Job • Storage & Handling of Electrodes • Effects of Electrode Angle on Weld Quality*
1230 - 1245	*Break*
1245 - 1330	***Gas Cutting Techniques*** *Steps to Start Cutting a Metal Plate • Preheating & Controlling the Cutting Speed • Piercing Holes in Thick Plates • Common Issues in Gas Cutting & Solutions*
1330 - 1420	***Practical Session: Straight Cuts & Beads*** *Practicing Straight-Line Cuts on Mild Steel • Running Basic Beads with Arc Welding • Checking & Improving Weld Quality • Troubleshooting Uneven Cuts*
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	*End of Day Two*

Day 3: ***Tuesday, 12th of August 2025***

0730 – 0830	***Welding Joint Types*** *Butt Joint: Features & Applications • Lap Joint: Strength & Use Cases • T-Joint: Challenges & Techniques • Corner Joint: Common Practices*
0830 – 0930	***Heat Control in Welding & Cutting*** *Effects of Excessive Heat on Metal Properties • Managing Heat Input for Different Thicknesses • Role of Cooling in Preventing Distortions • Preheating & Post-Heating Techniques*
0930 - 0945	*Break*
0945 – 1100	***Advanced Cutting Methods*** *Cutting Curves & Complex Shapes • Gouging & Beveling Techniques • Cutting Thick Metal Plates Efficiently • Dealing with Slag Formation*
1120 - 1230	***Common Welding & Cutting Defects*** *Porosity & Cracks in Welds • Undercut, Overlap, & Lack of Fusion • Rough Edges & Uneven Cuts • Inspection Methods & Corrective Actions*
1230 - 1245	*Break*
1245 - 1330	***Welding Positions & Challenges*** *Challenges in Vertical & Overhead Welding • Techniques for Maintaining Arc Stability • Strategies to Avoid Gravity-Induced Weld Defects • Practicing Out-Of-Position Welding*
1330 - 1420	***Practical Session: Complex Joints & Shapes*** *Welding T-Joints & Corner Joints • Cutting Circular & Irregular Shapes • Evaluating Weld Penetration & Bead Consistency • Improving Torch Control in Gas Cutting*
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	*End of Day Three*

Day 4: Wednesday, 13th of August 2025

0730 – 0830	***Welding Metal Types*** *Differences in Welding Mild Steel, Stainless Steel, & Aluminum • Adjusting Current & Electrode for Different Metals • Challenges in Welding Non-Ferrous Metals •Techniques for Multi-Pass Welding*
0830 – 0930	***Troubleshooting Welding Defects*** *Identifying & Fixing Weld Cracks • Improving Bead Uniformity & Penetration • Addressing Undercut & Overlap Issues • Avoiding Warping & Distortion*
0930 - 0945	*Break*
0945 – 1100	***Cutting Different Materials*** *Cutting Mild Steel Vs. Stainless Steel • Techniques for Cutting Thin & Thick Plates • Adjusting Torch Settings for Non-Ferrous Metals • Managing Slag in Different Materials*
1120 - 1230	***Weld Testing & Quality Control*** *Visual Inspection of Welds • Destructive & Non-Destructive Testing Methods • Understanding Codes & Standards for Weld Quality • Documentation of Weld Inspection Results*
1230 - 1245	*Break*
1245 - 1330	***Equipment Maintenance*** *Cleaning & Maintaining Welding Machines • Checking Cables, Electrodes, & Clamps • Servicing Gas Cylinders & Torches • Preventative Maintenance Schedules*
1330 - 1420	***Practical Session: Real-World Applications*** *Welding & Cutting Sample Workpieces • Practicing Multi-Pass Welding • Cutting & Preparing Materials for Fabrication • Group Evaluation & Feedback on Projects*
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	*End of Day Three*

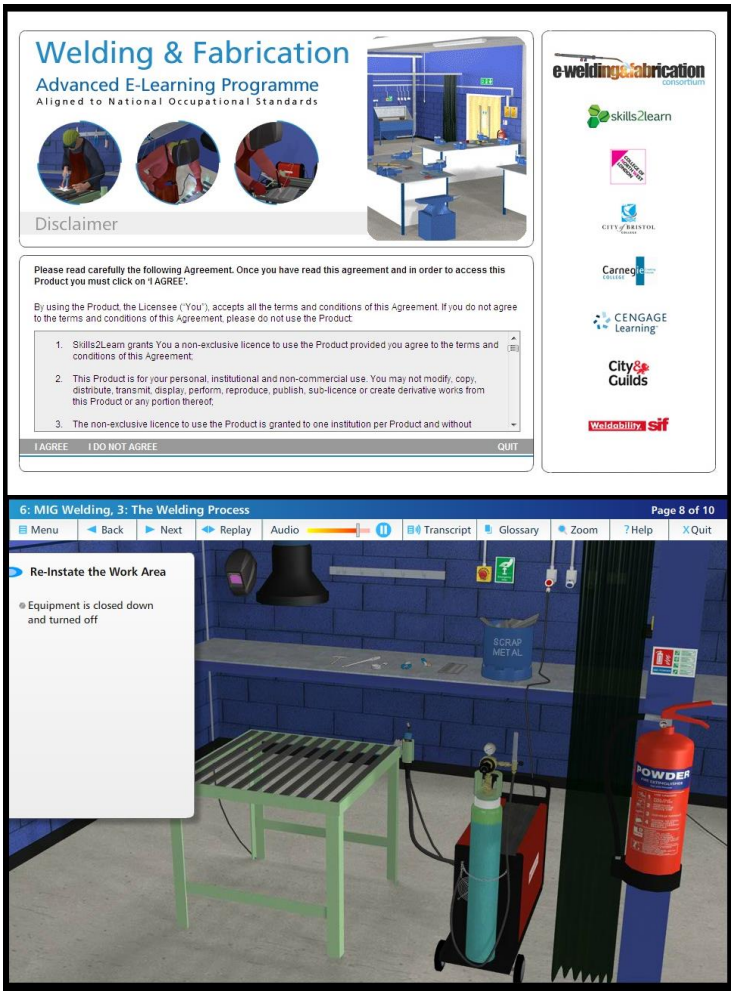
Day 5: Thursday, 14th of August 2025

0730 – 0930	***Welding Procedures & Documentation*** *Understanding Welding Procedure Specifications (WPS) • Recording Welding Parameters & Results • Importance of Traceability in Welding Projects • Examples of Industry-Standard Documentation*
0930 - 0945	*Break*
0945 - 1100	***Advanced Gas Cutting Applications*** *Pipe Cutting & Beveling Techniques • Performing Freehand Cuts with Precision • Cutting Materials for Repair & Maintenance • Troubleshooting Advanced Cutting Issues*
1100 - 1230	***Specialized Welding Techniques*** *Tack Welding for Structural Stability • Weld Buildup & Repair Techniques • Hardfacing for Wear Resistance • Introduction to Submerged Arc Welding*
1230 - 1245	*Break*

1245 - 1345	***Welding & Cutting Economics*** *Cost Analysis of Consumables & Energy Use • Optimizing Time & Materials • Reducing Waste in Welding & Cutting Processes • Productivity Improvement Strategies*
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	*End of Course*

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".



E-Welding & Fabrication

Course Coordinator

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