COURSE OVERVIEW FE0424

Advance Metalworking Processes: Shearing, Punching and Forming

Course Title

Advance Metalworking Processes: Shearing, Punching and Forming

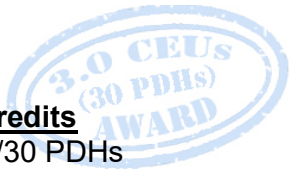
Course Date/Venue

Session 1: April 14-18, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Session 2: August 10-14, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference

FE0424



Course Duration/Credits

Five days/3.0 CEUs/30 PDHs

Course Description

This hands-on, 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 a welding & fabrication software to practice some of the skills learnt.

Welding and metal fabrication employs a unique hands-on, project-based learning strategy to teach welding skills effectively and keep you motivated. This groundbreaking course connects each welding technique to a useful and creative take-home project, making exercises both practical and personal and avoiding the tedium of traditional, repetitive welding practices.

The course will enhance the learning process, every welding project includes a set of prints with specifications, like those used in production fabrication shops. It will feature approach to skill-building reflects the reality of professional welding, where following prints and instructions precisely and laying out, cutting out, and assembling weldment accurately are just as essential as high-quality welding.

Course Objectives

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

- Apply and gain an in-depth knowledge on maintenance metal and advance fabrication
- Carryout measuring, marking out and material removal
- Describe sheet and plate metalwork, structural steelwork and pipework
- Illustrate joining processes including mechanical connections, soldering, brazing and braze-welding and welding
- Recognize welding joint design and welding symbols
- Employ fabrication techniques and practices
- Implement various welding process such as SMAW, GMAW and GTAW
- Identify the shielded metal arc welding plate and oxyacetylene cutting
- Apply plasma arc cutting, arc cutting, gouging and related cutting process
- Analyse welding automation, robots and weldability of metals
- Conduct testing and inspecting welds in a professional manner

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 is intended for welding engineers, inspection engineers, facility integrity engineers, fabrication engineers, mechanical engineers, NDT personnel, quality assurance personnel, testing laboratory personnel, and maintenance personnel. Further, this course is a must for anyone involved in inspection of welding construction, qualifying welders, brazers and operators; or involved in writing and qualifying welding and brazing procedure specifications; those responsible for reviewing supplier procedures, auditing or reviewing in-house procedures and qualifications; and those who estimate jobs in compliance of ASME code.

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.

Accommodation

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

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course completed a minimum of 80% of the total tuition hours.

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.

- 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

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

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.

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 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Measuring & Marking Out*** *Linear Measurement • Angular Measurement • Correct Use of Measuring Equipment • Marking Out Equipment (Tools for Making Lines) • Marking Out Equipment (Tools for Providing Guidance) • Marking Out Equipment (Tools for Providing Support) • Techniques for Marking Out • The Need For Templates • The Manufacture of Templates • The Use of Templates • Condition and Care of Equipment*
0930 – 0945	*Break*
0945 – 1030	***Material Removal*** *Cutting Tool Principles • The Application of Basic Cutting Tool Angles to Hand Tools • Drilling, Drilling Machines and Routing • Shearing Sheet Metal • Portable Power Tools • Blanking (Stamping and Piercing) • Flame Cutting*
1130 – 1215	***Sheet & Plate Metalwork*** *Sheet and Plate Metalwork (Introduction) • Roll-Bending Sheet Metal and Plate • Flow Forming Sheet Metal • The Principles of Metal Spinning • Swaging Sheet Metal • Basic Fabrication Procedures*
1215 – 1230	*Break*
1230 – 1420	***Structural Steelwork & Pipework*** *Rolled Steel Sections • Typical Structural Steel Connections and Assemblies • Trusses and Lattice Frames • Web Stiffeners • Fabricated Lightweight Beams • Castellated Beams • Pipework (Setting Out Bends) • Pipe Bending • Pipe Fitting*
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	*Lunch & End of Day One*

Day 2

0730 – 0930	***Joining Processes (Mechanical Connections)*** *Mechanical Connections (Threaded) • Hand Reamers and Reaming • Riveted Joints • Pop® Diveting • Self Secured Joints • Folding and Jointing Allowance • The Pittsburgh Lock*
0930 – 0945	*Break*
0945 – 1100	***Joining Processes (Soldering, Brazing & Braze-Welding)*** *Soft Soldering • Soft-Soldered Joints Using Lead-Free Solders • Hard Soldering (Brazing) • Aluminium Brazing • Types of Brazed Joints • Braze-Welding*
1100 – 1200	***Joining Processes (Welding)*** *Fusion Welding • Oxy-Acetylene Welding • Manual Metal-Arc Welding • Workshop Testing of Welds • Miscellaneous Fusion Welding Processes • Workholding Devices for Fusion Welding • Resistance Welding • Further Welding Processes*
1200 – 1245	*Break*
1245 – 1420	***Welding Joint Design, Welding Symbols*** *Weld Joint Design • Welding Symbols • Indicating Types of Welds • Weld Location • Location Significance of Arrow • Fillet Welds • Plug Welds • Spot Welds • Seam Welds • Groove Welds • Backing • Flange Welds • Nondestructive Testing Symbols*
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	*Lunch & End of Day Two*

Day 3

0730 – 0930	***Fabricating Techniques & Practices*** *Fabrication • Parts & Pieces • Tack Welds • Location & Alignment Points • Overall Tolerance • Weld Distortion • Layout • Material Shapes • Assembly • Assembly Tools • Fitting*
0930 – 0945	*Break*
0945 – 1100	***Shielded Metal Arc Welding (SMAW)*** *Welding Current • Types of Currents • Welding Power • Open Circuit Voltage • Operating Voltage • Arce Blow • Types of Power Sources • Generator & Alternator Welders • Converting AC to DC • Duty Cycle • Welder Accessories • Equipment Setup*
1100 – 1200	***Shielded Metal Arc Welding Plate*** *Electrodes • Striking an Arc • Tack Welds • Stringer Beads*
1200 – 1245	*Break*
1245 – 1420	***Shielded Metal Arc Welding Pipe*** *Pipe & Tubing • Pipe Welding Passes*
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	*Lunch & End of Day Three*

Day 4

0730 – 0930	***Gas Metal Arc Welding (GMAW)*** *GMA Welding Equipment • GMAW Shielding Gases • Gas Flow Rate • Weld Metal Transfer Methods • GMAW Electrodes • GMAW Electrodes Classification • Equipment Setup • Arc Voltage & Amperage • Gun Angle • Intermittent Butt Welds*
0930 – 0945	*Break*
0945 – 1100	***Gas Tungsten Arc Welding (GTAW)*** *GTA Welding Equipment • GTA Welding Torches • Tungsten Electrodes • Flowmeter • Shielding Gases • Types of Welding Current • Remote Controls • Setting Up a GTA Welder*
1100 – 1200	***Oxyacetylene Cutting*** *Metals Cut by the Oxyfuel Process • Eye Protection for Flame Cutting • Cutting Torches • Oxyfuel Cutting, Setup, & Operation • Torch Tip Alignment • Layout • Selecting the Correct Tip & Setting the Pressure • The Chemistry of a Cut • Cutting Applications • The Physics of a Cut • Slag • Plate Cutting • Cutting Table • Torch Guides • Stopping & Starting Cuts • Flame Cutting Holes • Distortion • Machine Cutting Torch • Irregular Shapes • Pipe Cutting*
1200 – 1245	*Break*
1245 – 1420	***Plasma Arc Cutting*** *Plasma • Arc Plasma • Plasma Torch • Cables & Hoses • Power Requirements • Heat Input • Distortion • Applications • Gasses • Machine Cutting • Safety • Manual Cutting • Beveling of a Plate • Cutting Round Stock • Plasma Arc Gouging*
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	*Lunch & End of Day Four*

Day 5

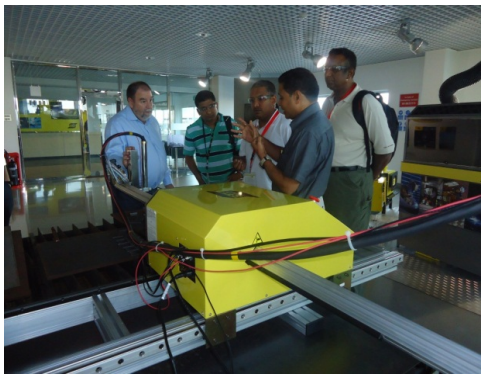
0730 – 0930	***Arc Cutting, Gouging & Related Cutting Process*** *Lasers • Laser Types • Applications • Laser Beam Cutting • Laser Beam Drilling • Laser Beam Welding • Laser Equipment • Oxygen Lance Cutting • Water Jet Cutting • Arc Cutting Electrodes • Air Carbon Arc Cutting • U-Grooves • J-Groove*
0930 – 0945	*Break*
0945 – 1100	***Welding Automation & Robotics*** *Manual Joining Processes • Semiautomatic Joining Processes • Machine Joining Processes • Automatic Joining Processes • Automated Joining • Industrial Robots • Safety*
1100 – 1200	***Weldability of Metals*** *Steel Classification & Identification • Carbon & Alloy Steels • Stainless Steels • Cast Iron • Practice Welding Cast Iron • Welding without Preheating of Postheating • Aluminum Weldability • Repair Welding*
1200 – 1245	*Break*

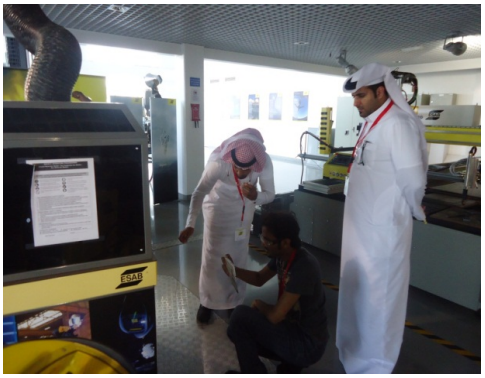
1245 – 1345	***Testing & Inspecting Welds*** *Quality Control (QC) • Discontinuities & Defects • Porosity • Inclusions • Inadequate Joint Penetration • Incomplete Fusion • Arc Strikes • Overlap • Undercut • Crater Cracks • Underfill • Lamellar Tears • Lamination • Delamination • Destructive Testing (DT) • Shearing Strength of Welds • Welded Butt Joints • Nick-Break Test • Guided-Bend Test • Free-Bend Test • Alternate Bend • Fillet Weld Break Test • Impact Testing • Nondestructive Testing (NDT)*
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	*Lunch & End of Course*

Practical Sessions/Site Visit

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

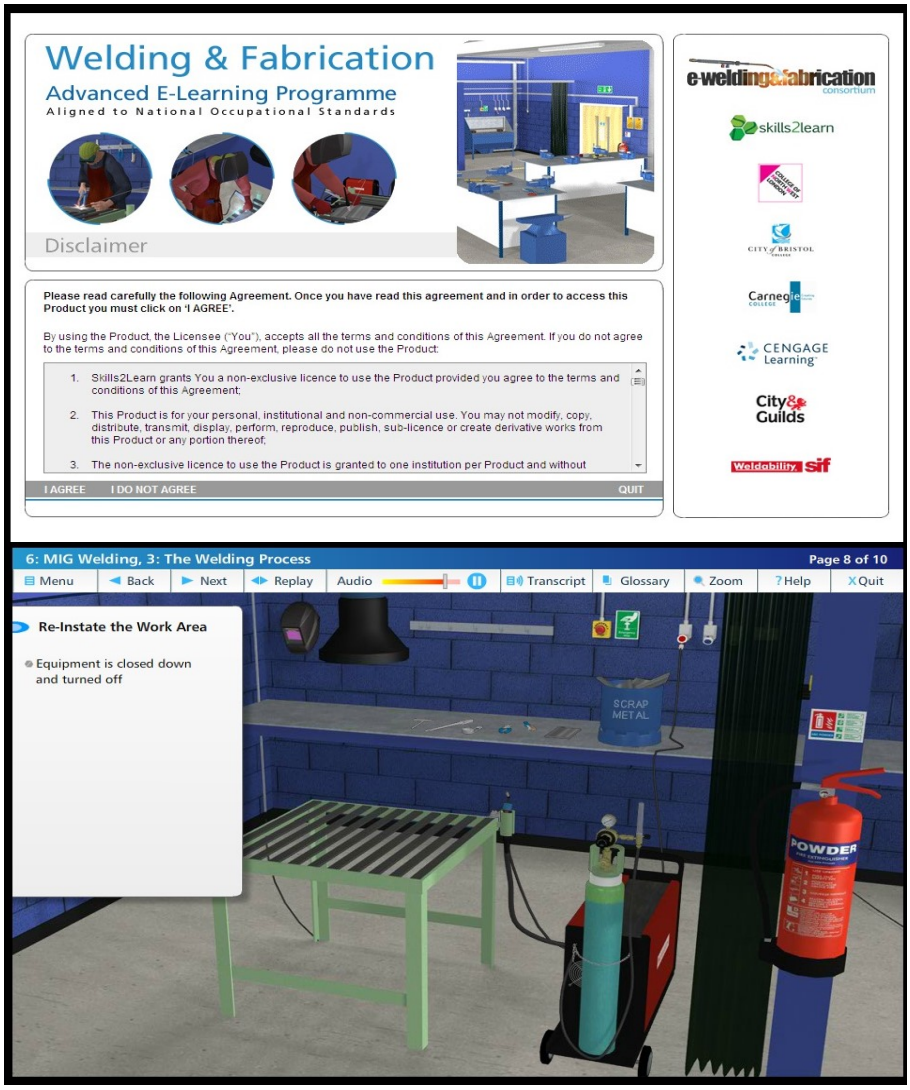




Simulator (Hands-on Practical Sessions)

Practical 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 one of our state-of-the-art simulators "E-Welding & Fabrication".



E-Welding & Fabrication

Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org