



COURSE OVERVIEW FE0048 Welding & Cutting

Course Title

Welding & Cutting

Course Date/Venue

February 11-15, 2024/The Mouna Meeting Room,
The H Dubai Hotel, Sheikh Zayed Rd - Trade
Centre, Dubai, UAE

Course Reference

FE0048

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs



Course Description



This practical and highly-interactive course includes various practical sessions and exercises. Practical sessions will be performed using welding & cutting equipment in order to apply the theory learnt in the class.



This course is designed to provide participants with a fundamental overview of Welding & Cutting. It covers the scope and applications in engineering maintenance of welding and cutting; the importance of safety measures, personal protective equipment (PPE) and workplace safety standards; the fundamentals of welding and the basic concepts, terminology and the physics behind welding processes; the welding process and the different welding methods such as MIG, TIG, stick and others; the critical general aspects of welding; and the quality control, defect identification and corrective measures.



Further, the course will also discuss the basic metallurgy and the metal properties and its significance in welding; the various welding joints including butt, lap, corner and positions (1G to 6G); the welding accessories and equipment including welding tools, equipment and their usage; and the common cutting techniques comprising of oxy-fuel cutting, plasma cutting, laser cutting, etc.





During this interactive course, participants will learn the welding consumable storage and proper storage methods and their importance; the interaction of welding with different materials; the welding carbon and low alloy steels and the critical aspects, techniques and precautions; the higher alloy materials in welding and the complexities and methods for welding stainless steel, aluminum and other alloys; the weldability of different materials and how different materials respond to welding and techniques for effective welding; the common welding defects and non-destructive testing methods; the hot and cold tapping techniques and the procedures, applications and safety aspects; reading welding design and blueprint and interpreting welding blueprints and symbols; the quality control and inspection techniques and methods to ensure the quality and integrity of welds; the welding and cutting in maintenance; and the role of welding and cutting in routine in maintenance function.

Course Objectives

At the end of this course, the Trainee will be able to:-

- Apply and gain a fundamental knowledge on welding and cutting
- Explain critical general aspects of welding, various welding joints, various welding accessories and various ways of cutting materials
- Demonstrate welding consumable storage and welding
- Explain the critical material aspects for welding carbon and low alloy steels and material aspects for higher alloy materials
- Identify the scope and applications in engineering maintenance of welding and cutting
- Emphasize the importance of safety measures, personal protective equipment (PPE) and workplace safety standards
- Identify the fundamentals of welding as well as explore the basic concepts, terminology and the physics behind welding processes
- Develop welding process and use different welding methods such as MIG, TIG, stick and others
- Recognize the critical general aspects of welding as well as discuss quality control, defect identification and corrective measures
- Explain basic metallurgy and identify the metal properties and its significance in welding
- Explore various welding joints including butt, lap, corner and positions (1G to 6G)
- Prepare welding accessories and equipment including welding tools, equipment and their usage
- Carryout common cutting techniques comprising of oxy-fuel cutting, plasma cutting, laser cutting, etc.
- Describe welding consumable storage as well as demonstrate proper storage methods and their importance
- Examine the interaction of welding with different materials



- Identify welding carbon and low alloy steels and discuss the critical aspects, techniques and precautions
- Determine higher alloy materials in welding and explore the complexities and methods for welding stainless steel, aluminum and other alloys
- Examine weldability of different materials and analyze how different materials respond to welding and techniques for effective welding
- Review common welding defects and carryout non-destructive testing methods
- Carryout hot and cold tapping techniques and explain the procedures, applications and safety aspects
- Read welding design and blueprint as well as interpret welding blueprints and symbols
- Carryout quality control and inspection techniques and methods to ensure the quality and integrity of welds
- Apply welding and cutting in maintenance and discuss the role of welding and cutting in routine in maintenance function

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 a fundamental overview of welding and cutting for engineering maintenance, welders and machinists.

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 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 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: -

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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.

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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.





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. Hesham Moharram, is a **Senior Inspection Engineer** with over **35 years** of industrial experience in the **Oil & Gas, Refineries** and **Petrochemical** industries. His expertise includes **Facility Integrity, Technical Integrity, Repair of Pressure Equipment and Piping, Process Piping, Valves, Flanges and Fitting Standards, Integrated Safety Management Plan, Inspection, Repair, Maintenance, Alteration and Reconstruction of Aboveground Storage**

Tanks, Pressure Vessels, Piping Inspection, Risk-Based Inspection, Fitness-for-Service (FFS), Asset Integrity Management, Plant Inspection & Corrosion Engineering, Pipeline Integrity Assessment, Integrity Management, Pipeline Rehabilitation & Repair, Pipeline Design & Maintenance, Corrosion Monitoring & Cathodic Protection, Pressure & Leak Testing, Metallurgy, Corrosion & Prevention of Failures, Material Selection & Properties, Physical Metallurgy of Steel, Welding Technology, Fabrication & Inspection, Conventional & Advanced Non-destructive Testing (NDT), Process Safety Hazard Analyses (PHA), Risk Assessment, Pigging & Pipe Support and Acoustic Emission. Further, he is also well-versed in Quality Assurance & Quality Control, **HAZOP**, Permit-to-Work, Hazard Identification, Safety Meeting, Accident Investigation, Emergency Response, Task Risk Assessment, Root Cause & Failure Analysis, Fire Fighting, First Aid Basic, CPR, H₂S Awareness, Distillation Units, Preventive Maintenance, FEED, Contract Management, Stress Management, Coaching & Mentoring Skills, Interpersonal Skills and Communication Skills. He is currently the **Senior Inspection Engineer** wherein he is responsible in various inspection works like fitness-for-service, remaining life assessments, risk based inspection, intelligent pigging, problematic pipe supports, non-destructive testing and acoustic emission.

Throughout his career life, Mr. Hesham has provided significant contributions to the companies he has worked with, having filled key positions such as being the **Senior Inspection Engineer, Inspection Engineer, Production Engineer, API Instructor, QA/QC and Supervisor** for international companies such as Abu Dhabi Company for Onshore Oil Operations (**ADCO**), Suez Oil Company (**SUCO**), Cairo Oil Refining Company (**CORC**) Refinery, DURA Refinery, State Company for Oil Projects (**SCOP-IRAQ**) and **Iron & Steel**.

Mr. Moharram has a **Bachelor's** degree in **Metallurgical Engineering**, from the Suez Canal University. Further, he is a **Certified Instructor/Trainer**, a **Certified Pressure Vessel Inspector (API-510)**, **Certified Piping Inspector (API-570)**, **Certified Aboveground Storage Tanks Inspector (API-653)**, **Certified Risk Based Inspector (API-580)**, an **ASNT Certified Level II** in **UT, RT, MT, PT** and **Eddy Current Testing**.



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, 11th of February 2024

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	Introduction to Welding & Cutting: Understanding the Scope and Applications in Engineering Maintenance
0930 – 0945	Break
0945 – 1100	Safety in Welding & Cutting: Emphasizing the Importance of Safety Measures, Personal Protective Equipment (PPE) and Workplace Safety Standards
1100 – 1230	Fundamentals of Welding: Exploring the Basic Concepts, Terminology and the Physics Behind Welding Processes
1230 – 1245	Break
1245 -1420	Welding Processes Overview: Introduction to Different Welding Methods such as MIG, TIG, Stick and others
1420 – 1430	Recap
1430	Lunch & End of Day One

Day 2: Monday, 12th of February 2024

0730 – 0930	Critical General Aspects of Welding: Discussing Quality Control, Defect Identification and Corrective Measures
0930 – 0945	Break
0945 – 1100	Basic Metallurgy: Understanding the Metal Properties and its Significance in Welding
1100 – 1230	Welding Joints & Positions: Exploring Various Welding Joints (Butt, Lap, Corner, etc.) and Positions (1G to 6G)
1230 – 1245	Break
1245 -1420	Welding Accessories & Equipment: Detailed Overview of Welding Tools, Equipment and their Usage
1420 – 1430	Recap
1430	Lunch & End of Day Two

Day 3: Tuesday, 13th of February 2024

0730 – 0930	Fundamentals of Cutting Processes: Overview of Common Cutting Techniques - Oxy-Fuel Cutting, Plasma Cutting, Laser Cutting, etc.
0930 – 0945	Break
0945 – 1100	Welding Consumable Storage: Demonstrating Proper Storage Methods and their Importance
1100 – 1230	Material Science in Welding: Understanding the Interaction of Welding with Different Materials
1230 – 1245	Break
1245 -1420	Welding Carbon & Low Alloy Steels: Discussing the Critical Aspects, Techniques and Precautions
1420 – 1430	Recap
1430	Lunch & End of Day Three





Day 4: Wednesday, 14th of February 2024

0730 – 0930	Higher Alloy Materials in Welding: Exploring the Complexities and Methods for Welding Stainless Steel, Aluminum and Other Alloys
0930 – 0945	Break
0945 – 1030	Weldability of Different Materials: Analyzing How Different Materials Respond to Welding and Techniques for Effective Welding
1030 – 1130	Welding Defects & Testing Methods: Understanding Common Welding Defects and Non-Destructive Testing Methods
1130 - 1230	Hot & Cold Tapping Techniques: Explaining the Procedures, Applications and Safety Aspects
1230 – 1245	Break
1245 -1420	Welding Design & Blueprint Reading: Teaching How to Read and Interpret Welding Blueprints and Symbols
1420 – 1430	Recap
1430	Lunch & End of Day Four

Day 5: Thursday, 15th of February 2024

0730 – 0930	Quality Control & Inspection Techniques: Methods to Ensure the Quality and Integrity of Welds
0930 – 0945	Break
0945 – 1100	Application of Welding & Cutting in Maintenance: Discussing the Role of Welding & Cutting in Routine in Maintenance Function
1100 – 1230	Practical Demonstration of Cutting Techniques: Hands-on Session with Various Cutting Methods
1230 – 1245	Break
1245 – 1345	Practical Demonstration of Welding Techniques: Applying Learned Techniques on Various Metals and Joints
1345 – 1400	Course Conclusion
1400 – 1415	POST-TEST
1415 – 1430	Presentation of Course Certificates
1430	Lunch & End of Course





Practical Sessions

Practical session will be organized during the course for delegates to practice the theory learnt.







Liquid Penetrant Testing (PT) Equipment



Magnetic Particle Testing (MT) Equipment





Ultrasonic Testing (UT) Equipment



Ultrasonic Testing Package USM 36



Flawed Specimen Test Components

Course Coordinator

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