



WE103

Advanced Welding Technology

Course Introduction:

This course teaches the principles of arc and oxy-acetylene welding, flame cutting, and brazing with emphasis on mastering basic welding techniques.

Course Objectives:

Upon successful completion of this course, the delegates will be able to:

- ✓ The participants should be able to identify the tools and techniques associated with welding-related fabrication and quality control.

Who Should Attend?

This course design for:

Supervisor, foreman and engineers.

Course Outline:

Day 1:

Operate all of the welding shop equipment in a safe and careful manner

Learning Objectives

- What you will learn as you master the competency:
- List all of the safety rules which apply to the welding shop.
- Be alert to situations which produce specific hazards in the welding environment.
- Identify the causes of accidents in case studies.
- Develop the habits of working safely in all situations.

Performance Standards

Competence will be demonstrated:

- Criteria - Performance will be satisfactory when:
- learner works safely and uses appropriate safety gear with each piece of welding
- Equipment.
- Learner sets up all of the welding equipment correctly for the required conditions.
- Learner operates all of the welding equipment safely.
- learner uses all appropriate safety procedures while using welding and cutting
- Equipment.

Day 2:

Operate the O-A cutting torch and plasma torch to produce accurate cuts in metal projects

Learning Objectives

What you will learn as you master the competency:

- Diagram the cutting processes and explain how they work.
- List the components of an ox-acetylene cutting torch and explain how they work.
- List the components of a plasma torch and explain how they work.
- Demonstrate the proper cutting techniques using O-A and plasma arc cutting.

Performance Standards

Competence will be demonstrated:

- Criteria - Performance will be satisfactory when:
- Learner installs components and adjusts each piece of cutting equipment correctly.
- Learner makes precise and accurate cuts on different thicknesses and shapes of metal
- Using the oxy-acetylene torch, the plasma cutter, the arc-air torch, the power shear, the
- Iron worker, the horizontal band saw and the abrasive cut off saw.
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- Equal Opportunity Employer and Educator
- Learner produces a minimum of waste in the cutting process.

Day 3:

Prepare edges and joints for effective weld procedures

Learning Objectives

What you will learn as you master the competency:

- a. Explain the reasons for proper edge joint preparation.
- b. Diagram different edge joint preparation for a variety of welded joints.
- c. List the reasons for joint spacing in square butt joints.
- d. Demonstrate the increased strength of a welded joint which occurs when proper edge
- Joint preparation has taken place.

Performance Standards

Competence will be demonstrated:

- By using the measuring and layout tools to produce accurate layouts.
- Criteria - Performance will be satisfactory when:
- Learner demonstrates correct use of the O-A torch for proper beveling and scarfing.
- Learner demonstrates the correct use of the horizontal band saw and the iron worker for edge preparation.
- Learner prepares 5 basic weld joints with correct edge preparation.

Day 4:

Select the proper electrodes for various welding applications on assigned projects

Learning Objectives

What you will learn as you master the competency:

- Describe the importance of tensile strength in choosing electrodes.
- List the ingredients in stick welding electrode coatings.
- Explain the difference between fast fill and fast freeze electrodes.
- Show which electrodes can be used in all positions.
- Demonstrate the effectiveness of low hydrogen electrodes in welding new steel.

Performance Standards

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Competence will be demonstrated:

- Criteria - Performance will be satisfactory when:
- Learner lists the criteria for selecting electrodes.
- Learner describes the advantages and disadvantages of each electrode.
- Learner defines the special purpose of each commonly used electrode.
- Learner chooses the correct electrode for each assigned lab project.

Day 5:

Produce sound welds in flat and horizontal positions using the O-A torch

Learning Objectives

What you will learn as you master the competency:

- List the components of a sound weld.
- Diagram the operations of producing a weld with good penetration and proper

- Configuration with both O-A and Arc welding techniques
- Recognize the distinct sound of an arc welding operation that is being done correctly.
- Develop a steady hand and a keen eye for detail in producing a good weld.

Performance Standards

Competence will be demonstrated:

- Criteria - Performance will be satisfactory when:
- Learner recognizes all of the components of correct welding procedure.
- Learner sets up the arc welder correctly for the conditions at hand.
- Learner sets up the oxy-acetylene torch correctly for the required job.
- Learner manipulates the stinger and rod to produce sound welds.
- Learner handles the torch with skill to produce high quality gas welds.
- Learner is able to produce sound welds in the flat and horizontal position with both gas Welding and arc welding.

Produce sound welds in flat and horizontal positions using the arc welder

Learning Objectives

What you will learn as you master the competency:

- Recognize the appearance and the sound of a good weld as it progresses.
- Manipulate the welding rod to produce maximum penetration and good weld beads.
- Produce good sound welds with various rods and arc welding machines.

Complete six basic weld joints with both arc and gas welding

Learning Objectives

What you will learn as you master the competency:

- List the factors which must be considered in proper weld joint design.
- Describe the effect on the welded joint when the amount of weld material is insufficient.
- Using the oxy-acetylene torch on 16 gage steel substrate complete the following weld Joints: butt, flange, lap, inside corner, outside corner and plug weld.
- Using the arc welding equipment complete the following weld joints; lap, tee, butt,
- Outside corner, groove, and pad.

Produce sound braze joints with brass and silver filler material

Learning Objectives

What you will learn as you master the competency:

- Describe and define the brazing process.
- Diagram the physical and chemical process which occurs in brazing.
- Demonstrate the effects of capillary action in brazing.
- List the different filler materials which are used for brazing operations.
- Demonstrate the correct procedures for joining two steel parts together with solid braze joints.

Course Certificate:

International Center for Training & Development (ICTD) will award an internationally recognized certificate(s) for each delegate on completion of training.

Course Methodology:

A variety of methodologies will be used during the course that includes:

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionnaires
- Group Work
- Discussion
- Presentation

Course Fees:

To be advised as per course location. This rate includes participant's manual, Hand-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Timings:

Daily Course Timings:

08:00 - 08:20	Morning Coffee / Tea
08:20 - 10:00	First Session
10:00 - 10:20	Coffee / Tea / Snacks
10:20 - 12:20	Second Session
12:20 - 13:30	Lunch Break & Prayer Break
13:30 - 15:00	Last Session

