

# INDUSTRIAL MAINTENANCE: WELDING PRODUCTION

## Levels 1-5

Learners on this pathway are introduced to the basic tools of welding and their application to the manufacturing process. Special attention is paid to the types of metal to which welds will be applied and to the designs and drawings welders use to determine where to make the welds. This pathway employs one level covering five areas of expertise through 13 courses. It will take learners 18 hours to complete this pathway.

Among the objectives for this pathway, learners will be able to:

- identify types of welds and the symbols on drawing calling for each
- describe the basic types of joints used in welding
- understand the use of a variety of gauges used to measure weld quality
- describe the properties of metals and nonmetals
- explain the purpose of blueprints and other engineering drawings

**Total # of Modules: 13**

**Total Hours: 18**



# WELDING-PRODUCTION

## Level 1

### Welding Skills

- 1.1 Welding Basics
- 1.2 Introduction to Welding

### Welding for NDE

- 1.3 Welding and Welding Discontinuities

### Weld Inspection Gauges

- 1.4 Weld Gauges

### Metal and Materials

- 1.5 Introduction to Metals
- 1.6 Ferrous Metals
- 1.7 Nonferrous Metals
- 1.8 Heat Treatment of Metals

### Blueprint Reading Fundamentals

- 1.9 Introduction to Blueprints
- 1.10 Engineering Drawing Terminology
- 1.11 Engineering Drawing Views
- 1.12 Engineering Drawing Lines
- 1.13 Dimensions and Tolerances

## Level 2

### Welding Processes

- 2.1 Weld Defects
- 2.2 Arc Welding Safety
- 2.3 Elements of an Arc Welding Circuit
- 2.4 Shielding

### Advanced Blueprint Reading

- 2.5 Geometric Dimensions and Tolerances
- 2.6 Assemblies and Fits
- 2.7 Threads and Fasteners

### Aerospace Wire Installation Drawings

- 2.8 Engineering Drawing Review

### Geometric Dimensioning and Tolerancing

- 2.9 Introduction to GD&T
- 2.10 GD&T Terms and Symbols
- 2.11 Rules of GD&T
- 2.12 Geometric Tolerances

## Level 3

- 3.1 Arc Welding Parameters
- 3.2 Gas Metal Arc Welding (GMAW)
- 3.3 Flux Core Arc Welding (FCAW)
- 3.4 Gas Tungsten Arc Welding (GTAW)
- 3.5 Datums
- 3.6 Form Tolerances
- 3.7 Profile Tolerances

## Level 4

- 4.1 Plasma Arc Welding (PAW)
- 4.2 Shielded Metal Arc Welding (SMAW)
- 4.3 Submerged Arc Welding (SAW)
- 4.4 Electroslag Welding (ESW) and Electrogas Welding (EGW)
- 4.5 Orientation Tolerances
- 4.6 Runout Tolerances
- 4.7 Location Tolerances