Engineering Drawing Interpretation for Sheet Metal and Costing Professionals Training Course

Target Audience

This course is designed for non-technical staff, costing engineers, sourcing professionals, and sales teams working in sheet metal manufacturing environments who need to read and interpret engineering drawings. It is suitable for individuals with little or no prior CAD or engineering background who want to develop the ability to understand drawings, dimensions, tolerances, symbols, and bill of materials for accurate quotation and costing.

Course Outcomes

- Understand the fundamentals of engineering drawing interpretation
- Identify and interpret orthographic views and projections
- Apply knowledge of dimensions, tolerances, and fits in real scenarios
- Interpret section views and hidden features in complex drawings
- Recognize and understand common manufacturing and sheet metal symbols
- Analyze sheet metal drawings including bends, holes, and flat patterns
- Interpret bill of materials for costing and sourcing decisions
- Use basic CAD visualization techniques for better understanding of drawings

Course Objective

- Develop structured understanding of engineering drawing standards
- Build proficiency in reading and interpreting 2D mechanical drawings
- Enable learners to understand tolerances and their impact on manufacturing
- Introduce sheet metal specific drawing elements and fabrication features
- Strengthen interpretation skills for costing and quotation processes
- Reinforce learning through practical examples and real-world drawings
- Provide basic exposure to CAD tools for visualization

Course Outline

The course comprises 32-hours of theory and labs and is divided into 8 different chapters. Each chapter will be followed by hands-on lab exercises to reinforce learning and gauge understanding of the topics covered.

Table of Contents

Chapter 1. Introduction to Engineering Drawings and CAD Basics

- Importance of engineering drawings in manufacturing
- Types of drawings
- Drawing standards and formats
- Title block and drawing information
- Units and scales
- Getting started with CAD environment
- Understanding interface elements Ribbon, Browser, ViewCube
- Navigation and viewing of models
- Identifying CAD file types and formats

Chapter 2. Orthographic Projection and Visualization

- Concept of orthographic projection
- Front, top, and side views
- First angle and third angle projection
- Understanding multiple views
- Visualization of 3D objects from 2D drawings
- Basic interpretation of simple parts

Chapter 3. Sketch Basics for Drawing Understanding

- Creating basic sketches Line, Circle, Rectangle
- Understanding sketch geometry
- Editing sketches Trim, Extend, Offset
- Pattern and mirror basics
- Role of sketches in part design

Chapter 4. Dimensions, Constraints and Tolerances

- Types of dimensions
- Dimensioning practices
- Applying and modifying dimensions
- Concept of constraints
- Under constrained and fully constrained sketches
- Tolerances and limits
- Fits and allowances
- Introduction to geometric tolerancing

Chapter 5. Section Views and Advanced Visualization

- Purpose of section views
- Types of section views
- Hidden features and internal details
- Reading complex parts using sections
- Visualization using CAD tools

Chapter 6. Manufacturing Symbols and Annotations

- Welding symbols
- Surface finish symbols
- Hole callouts
- Thread and tapping symbols
- General notes and annotations

Chapter 7. Sheet Metal Drawing Interpretation

- Sheet metal drawing concepts
- Bend lines and bend allowance
- Flat pattern understanding
- Holes, slots, countersinks
- Common sheet metal features
- Interpretation of fabrication drawings

Chapter 8. Bill of Materials and Costing Interpretation

- Understanding BOM
- Parts list and item numbers
- Quantity and material identification
- Reading drawings for costing and sourcing
- Practical examples from manufacturing
- Introduction to cost estimation from drawings