Course ID
PRINTREAD
Course Duration
1 day

Course Title
Print Reading Workshop for Engineers and Support Personnel

Related Courses

- Geometric Dimensioning & Tolerancing (GD&T): 3-Day Workshop (GDT3D, 3 days)
- Geometric Dimensioning and Tolerancing: A Comprehensive Workshop (GDT, 2 days)
- Statistical Tolerance Analysis: A Comprehensive Workshop (S-TOL-ANAL, 2 days)
- Tolerance Stack Analysis Using GD&T (TOL-GDT, 2 days)

Aimed At

This course is aimed at those involved in mechanical design and manufacturing as well as those who support them. Product engineers, manufacturing engineers, quality managers and inspectors, CAD operators, and supplier relations personnel will all benefit from this course.

Group Size

5-25

Prerequisites

There are no prerequisites.

Course in a Nutshell

This course teaches how to interpret the views, callouts, and other information communicated on mechanical drawings. You will gain a complete understanding of all aspects of blueprints, from reading the title block to visualizing a three-dimensional part from a two-dimensional rendering.

Other topics include: section views, dimensioning and tolerancing practices, and special callouts for screw threads, surface finish, and an introduction to GD&T.

Customize It!

Based on the knowledge base of your group, and the types of products you work with, we can customize the course to your specific needs. We also encourage participants to bring actual prints/drawings to the course for a discussion of the proper interpretation for your products. If sample prints are provided, the course can be turned into a workshop at no added cost.

While the course is mainly designed around the Y14 standards (ASME), it can be customized to accommodate other standards, such as the internal company standards for your prints.

Learn How To

- Interpret different styles of lines shown on a print
- Visualize an object based on the given flat images
- Recognize first-angle projection and third-angle projection drawings
- Interpret the title block and the information it contains
- Use auxiliary and section views to supplement your understanding of a part
- Describe symbols and instructions for special machining processes
- Interpret various dimensioning methods and the allowable tolerances

Course Outline

- Blueprint Basics
  - Importance of engineering drawings
  - Types of graphic representation
  - Basic steps in reading a print

- Types of Lines
  - Visible line
  - Hidden line
  - Center line
  - Extension line
  - Dimension and leader lines
  - Cutting plane and section lines
  - Break line
  - Phantom line

- Orthographic Projection
  - Why use orthographic projection?
  - The “glass box” visualization method
  - The “bowl” visualization method
  - First-angle vs. third-angle projection

- The Title Block
  - A tour of the usual items found in the title block
  - Sheet sizes
  - Materials list
  - General tolerances
  - Drawing revision process
  - Drawing notes

- Supplemental Views

- Auxiliary (angled) views
- Section views
- Removed views
- Detail and assembly drawings

- Dimensioning and Tolerancing
  - Definitions
  - Units (metric vs. inch)
  - Fundamental dimensioning rules
  - Limit dimensioning
  - Plus/minus tolerances
  - Special dimensioning symbols
  - Introduction to GD&T
  - Calculating dimensions / tolerance stacks
  - Capability and statistics in tolerancing

- Manufacturing Specifications
  - Screw threads
  - Machining callouts
  - Surface finish / roughness
  - Special considerations for plastics and sheet metal
  - Impact on tooling and inspection

- Wrap-up and Review of Drawings
  - How prints are influenced by "math data"
  - Review sample drawings
  - Evaluations

How You Will Learn

- A seasoned instructor with 20+ year engineering and teaching experience will present this course in interactive lecture format.
- Along with the lecture, we will use exercises to enrich the instruction and drive home the essential points. If sample prints are provided, the course can include a hands-on workshop session at no added cost.
- We will use meaningful and relevant examples and analogies to simplify the subject matter.
- You will receive a printed Participant Handbook which will help you remember and retain what you learned in class and apply it to your job.

Revised *3Ltb-f*