



CC095

Engineering Drawings, Codes and Standards

Course Introduction:

This fully interactive course explains how to correctly interpret engineering drawings. It will improve a participant's understanding of print reading and result in more effective communication on the job.

This course helps participants learn about the creation, interpretation and use of Engineering drawings, codes and standards, including manual and computer-aided design practices.

All over the years the industry has accumulated its experience in standards and codes which stipulates the minimum requirements to have a safe and economic products serving to the benefit of the project stakeholders. Every company should select from industry standards and codes and develop its standard which is its internal law responding to the minimum requirements normally set by the regulations and laws in the country where the company operates. The industry and company standards are interrelated in a way to build on the accumulated experience and mutual benefit for each party.

Course Objectives:

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

- Define and use techniques of engineering drawings
- Identify the types of engineering drawings
- Use the appropriate standards and documents specified on engineering drawings
- Acquire the basic part definition required on engineering drawings
- Understand the ASME standards and common industry practices.
- Practice, create and interpret the principles of engineering drawings, codes and standards.
- Apply best practice manufacturing and assembly guidelines to their designs
- Understand the capabilities and limitations of the main production processing groups.
- Problem-solve and work in teams on design projects.
- Apply process selection, component costing, manufacturing planning and design strategies to their projects.
- Provide trainees with the basic knowledge of industry standards and standardization bodies as well as the concept of standards, codes and specifications.

- Explain how to read and understand the articles and language of standards and codes. At the end of this practical workshop, participants would have Practical hands-on experience creating and reading engineering drawings.

Who Should Attend?

This course is intended for operations and maintenance engineers, senior engineers, supervisors, section heads, department heads from operation, maintenance, planning, contracts, procurement, supervisors whom their job duties require handling of Engineering drawings.

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 Certificate:

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

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 Outline:

Day 1:

Introduction to Engineering Drawings

- Engineering Drawings
- Computer-aided Design (CAD)
- The Purpose of Engineering Drawings
- The Importance of Engineering Drawings
- The Definition of a Standard
- The Importance of Drawing Standards
- ASME Y14.100-2004
- Using ASME Y14.100 on Engineering Drawings
- Specifying Drawing Standards
- Types of Engineering Drawings

Day 2:

Drawing Types, Part 1

- Layout Drawings
 - Design Layout Drawings
 - Contour Definition Drawings
- Detail Drawings
 - Mono Detail Drawings
 - Multi Detail Drawings
 - Tube Bend Drawings
- Assembly Drawings
 - Arrangement Drawings
 - Assembly Drawings
 - Inseparable Assembly Drawings
 - Installation Drawings
 - Wiring Harness Drawings

Day 3:

Drawing Types, Part 2

- Control Drawings
 - Altered Item Drawings
 - Design Parameter Drawings
 - Envelope Drawings
 - Interface Drawings
 - Procurement Control Drawings
 - Selected Item Drawings
 - Source Control Drawings
 - Vendor Item Control Drawings
 - When to use each type of Control Drawing
 - Control Drawing Requirements

Day 4:

Drawing Types, Part 3

- Diagram Drawings
 - Mechanical Schematic Diagram
 - Functional Block Diagram
 - Single Line Diagram
 - Schematic or Circuit Diagram
 - Connection or Wiring Diagram
 - Interconnection Diagram
 - Logic Circuit Diagram
 - When to use each type of Diagram Drawing
 - Diagram Drawing Requirements

Day 5:

- Project Life Cycle and Development Phases
- Engineering Design from Concept to Reality
- Standards and Standardizing Societies
- History of Codes Development
- Briefing on Codes Common to Petroleum Industries API, ASME, NFPA
- Evolution of European Codes and Normative
- Engineering Drawings Developed during different Design Phases
- Conceptual Design Inputs and Deliverables
- Front End Design Phase

- Detailed Design and Supply Specifications and Drawings
- Drawings and Specifications Revisions
- Plant piping Systems Drawings and Symbols According to ASME B31.3
- Pipe and Fittings Specifications and Standards
- PFD, P&IDs, Isometric, GA Drawings
- Plant Equipment and Standards for each type
- Fluid Power Diagrams and Control Systems
- Drafting Line Types and Standards
- Geometrical Dimensioning & Tolerances
- Modeling of Equipment's, Piping, Pipe Rack, Structures & Electrical Cable Trays
- Plant Modeling Software Packages
- Conflicts and Corrective Measures
- Preparation of MTO
- Material Selection and Standards Referenced
- ASTM Material Standard Specifications
- Material Quality Control and Certificates Requirements
- Case study of CAD Software Applied to Project Piping Drawing

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