Course 101: Reading Blueprints
Covers all types of blueprints used in industrial plants. Discusses machine parts and machine drawings. Features drawings of a compound rest and a clutch-brake control. Examines hydraulic, pneumatic, piping, plumbing, electrical, air-conditioning, and refrigeration drawings. Introduces sketching used in industrial plants.

TPC Training is accredited by IACET to offer 1.0 CEU for this program.

Lesson 1: Introduction to Blueprints
Topics
Importance of Blueprints; Purpose of Blueprints; Types of Information on Blueprints; Supplementary Spaces; Detail Drawings; Interpreting a Detail Drawing; Assembly Drawings; Orthographic Projections; Auxiliary Views; Sections; Pictorial Drawings
Objectives
• Identify details, markings, and machine parts from an assembly drawing.
• Identify an object from an orthographic drawing.
• Identify elements located within the title block of a detail drawing.
• Explain why more than one orthographic projection is needed to show an object on a blueprint.

Lesson 2: Machine Parts
Topics
Six Simple Machines; Screw Threads; Drawings of Screw Threads; Screw Thread Specifications; Heads; Rivets; Welds; Pins; Keys; Springs; Gears; Bearings; Belts and Pulleys
Objectives
• Describe what a machine is, and explain what it does.
• Name the two basic methods of joining machine parts.
• Name and identify from an exhibit several types of threaded fasteners.
• Name the two basic methods of permanent joining.
• Identify gears, bearings, and belt drives on drawings.
• Identify types of screw threads from a specification.

Lesson 3: Machine Drawings
Topics
Understanding Machine Tools; Purpose of the Compound Rest; Exploded View; Assembly Drawing; Detail Drawing; Comparison with Photograph; Clutch-Brake Control Mechanism; Exploded View; Assembly Drawing; Headstock Linkage; Clutch-Operating System; Assembly Drawing; Drafting Techniques for Gear Trains; Reading the Assembly Drawing
Objectives
• Name the main parts of a lathe.
• State the definition of an exploded view.
• Identify an assembly drawing.
• Identify a compound rest swivel on an assembly drawing.
• Identify a specific part on an assembly drawing.

Lesson 4: Sheet Metal Drawings
Topics
Sheet Metal; Ventilation Systems; Ductwork; Sheet Metal Drawings; Parallel Development; Miter Development; Radial Development; Extra Metal for Assembly
Objectives
• Describe the difference among coils, strips, and sheet metal.
• Describe how a ventilation system works.
• State the purpose of an arrow on a duct symbol.
• Demonstrate how to lay out a development.
• Define a radial development of a truncated pyramid.

Lesson 5: Building Drawings
Topics
Using Building Drawings; Buildings and Building Sites; Symbols and Conventions; Plat, Site Floor Plans; Working Drawings
Objectives
• Name building materials, given their standard symbols.
• Explain how to find useful information on a flow diagram.
• Explain how to find useful information on an industrial plat.
• List the contents of a set of building drawings.
• Describe the purpose of a structural drawing.

Lesson 6: Hydraulic and Pneumatic Drawings
Topics
Fluid Systems; Pascal’s Law; Multiplying Forces; Pistons and Cylinders; Fluid System Components; Hydraulic and Pneumatic Symbol
Objectives
• Name the components represented by common symbols on hydraulic and pneumatic drawings.
• Name the components in a simple hydraulic power system.
• Name the components in a simple pneumatic power system.
• State Pascal’s Law.
• Discuss the purposes of the components of hydraulic systems.

Lesson 7: Piping and Plumbing Drawings
Topics
Importance of Piping Systems; Piping and Plumbing Materials; Kinds of Joints; Fittings; Drawings; Joining Metal Pipes
Objectives
• State the definition of piping.
• Explain why joints are sometimes brazed instead of soldered.
• Explain how to assemble a screwed joint.
• Identify different types of pipe joints.
• Identify piping-system components shown in a single-line drawing.
• Define electrochemical corrosion.
Lesson 8: Electrical Drawings

**Topics**
- Importance of Electrical Drawings
- Electric Power
- Controlling Electricity
- Electrical Drawings
- Electrical Wiring
- Using Electrical Drawings

**Objectives**
- Identify different electrical symbols on a drawing.
- Identify the power distribution panels in your plant.
- Identify different types of conduit and cable.
- Select the best electrical drawing to use when looking for a faulty circuit between the basement and the first floor.
- Explain how electricity at 480 volts is reduced by a transformer to 120/240 volts.
- Define the terms voltage, current, and power

Lesson 9: Air Conditioning and Refrigeration Drawings

**Topics**
- Principles of Refrigeration
- Component Drawings
- Principles of Air Conditioning
- Air-Conditioning Systems
- A/C and R Operating Controls
- A/C and R Drawings

**Objectives**
- Explain how a refrigeration system works.
- Describe the types of ac controls.
- Name three kinds of condensers used in air conditioning systems.
- Explain the difference between unitary and central air-conditioning equipment.
- Explain how to find useful information on a duct drawing.

Lesson 10: Sketching

**Topics**
- Using Sketches
- Making Sketches
- Kinds of Sketches
- Orthographic Sketches
- Isometric Sketches
- Perspective Sketches

**Objectives**
- Name the four kinds of sketches.
- Identify an isometric sketch.
- Describe the appearance of a perspective drawing.
- Discuss how to sketch straight lines and curved lines.
- State the definition of a vanishing point.