

# Introduction to Technical Drawing

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## Overview

New to draughting? This course will help students gain the foundational knowledge of understanding technical drawings within the architecture, engineering and construction industries. It will teach the student the fundamentals to identify basic drawing equipment, read and interpret a paper based drawing and drawing arrangement by using practical and theoretical methods to illustrate drawing techniques.

The material will also include the requirements of ISO and SABS and should therefore give the learner an idea of the fundamentals of draughtsmanship.

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## Prerequisites

Anyone who wants to learn how to create and read a basic technical drawing and would like to train themselves further up into the software.

No prior knowledge of drawing is required.

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## Course Outline

### **Drawing Equipment**

- Introduction
- Drawing Equipment
  - Drawing paper and its application
  - Drawing board and its application
  - T-Square
  - Set squares or triangles and their application
  - Masking tape
  - Pencils and their application
  - Eraser (rubber)
  - Erasing shield
  - Adjustable compass or large bowl and its application
  - Sandpaper pad or file
  - Dust cloth or brush
  - Other instruments

- Scale rulers (metric)
- Essentials do's and don'ts of neatness in drawing

### **Application of the alphabet of lines**

- Introduction
- Application of the alphabet of lines Adding linear dimensions
  - Outlines or object lines (line type A)
  - Centre lines (line type G1)
  - Dimension lines (line type B2)
  - Extension lines for dimensions (line type B3)
  - Leader lines (line type B4)
  - Construction lines (line type BB1)
  - Projection lines (line type B)
  - Guide lines (line type BB2)
  - Dashed lines to show hidden details (hidden detail lines – line type E and F)
  - Hatched lines or section lines (line type B5)
  - Other lines

### **Lettering, figuring and dimensioning**

- Introduction
- Lettering figuring and dimensioning in drawing
  - Preparation of the drawing sheet
  - Lettering and figuring
  - Positions of the title and scale relative to each other
  - Positioning of the title and scale on the drawing sheet
  - Dimensioning on a working drawing
  - Different types of dimensions on a working drawing
  - Tolerance dimensions
  - Dimensioning keyways
  - Leaders
  - Machining symbols

### **Freehand sketching**

- Introduction
- Real-life (field) sketching and design sketching
- Freehand sketching
  - Sketching horizontal lines
  - Sketching vertical lines
  - Sketching slanted lines
  - Sketching curved figures and geometric shapes
  - Sketching irregular shapes
  - Isometric sketching
  - Oblique sketching

### **Constructions**

- Introduction
- Geometrical constructions
  - Bisecting lines and angles
  - Perpendiculars
  - Parallel lines
  - Setting out angles with the aid of set squares
  - Hexagons (Six-sided figures)
  - Octagons (Eight-sided figures)
  - Joining straight lines with arcs using a compass
  - An ellipse

### **Layout of drawings**

- Introduction
- Layout of drawings
  - First-angle orthographic projection
  - Third-angle orthographic projection
  - Projecting a third view
  - Drawing step-method for laying out drawings
  - Isometric drawings
  - Oblique drawings
  - Projections of prisms and pyramids
  - Developments
  - Interpenetrations

### **Sectioning**

- Introduction
- Sectioning
  - Terminology
  - Sectional cutting planes
  - Various aspects of sectioning
  - How to draw a sectional view
  - Sectional detail drawings

### **Conventional representations**

- Introduction
- Holes and fasteners
  - Representation of a drilled hole
  - Representation of a tapped hole (threaded hole)
  - Construction of a hexagonal nut
  - Representation of a hexagonal head bolt
  - Representation of a stud
  - Representation of a stud assembly
- Springs
  - Representation of springs
- Breaks
- Welded joints

- Types of welded joints
- Supplementary symbols

### **Fasteners**

- Introduction
- Types of threaded fasteners
  - Bolt heads
  - Screw heads
- Locking devices
- Riveted joints
- Single or double rivet joints

### **Assembly drawings**

- Introduction
- Hatching sectional drawings
- Sections of sectional drawings
- A typical assembly drawing
- Item numbers
- Parts list
- How to start an assembly drawing

### **Pipe drawings (chemical)**

- Introduction
- Kinds of piping
- Pipe joints and fittings
- Pipe drawings
- Pipe drawing symbols