

## Fundamentals of Mechanical Technology

*Cairo (Egypt)*

*20 - 24 April 2025*

UK Traininig

# PARTNER



# Fundamentals of Mechanical Technology

Code: OG28 From: 20 - 24 April 2025 City: Cairo (Egypt) Fees: 4000 Pound

## Introduction: Fundamentals of Mechanical Technology

Mechanical technology is a fundamental foundation for the development and design of systems and devices that rely on mechanics. In this training course, we will explore the basic principles of mechanical technology, including an understanding of forces, motions, and materials, and how to use this knowledge to design and manufacture mechanical components. The training will cover how to apply these principles to enhance performance and improve the efficiency of mechanical systems in various applications.

## Course Objectives Fundamentals of Mechanical Technology

- Perform NDE Non-Destructive Examination for static and rotating equipment
- Select proper materials for static and rotating equipment
- Understand the principle of operation and design for this equipment
- Protect the equipment from corrosion
- Identify different mode failures of static and rotating equipment

## Fundamentals of Mechanical Technology Course Outlines

### Day 1

#### Introduction & Fundamentals

- Engineering Material Properties
  - Stress and Strain
  - Fracture failure, Modes, Stress concentration, Fracture toughness
  - Fatigue failure, testing, and mechanism
  - Temperature Considerations and Creep Failure
  - Identification of Damage Mechanisms
- Mechanical Design
- ASME & API
- Codes & Standards
- Design for static strength

### Day 2

#### Materials Selection and Inspection

- Materials Selection
  - Materials of Construction
  - Carbon Steels
  - Alloy Steels
  - Stainless Steels
  - Nickel Based and Titanium Alloys



- Inspection techniques
- Visual
- Penetrant
- Magnetic Flux
- Eddy Current Inspections
- X-Ray & Gamma-ray
- Ultrasonics - TOFD & Pulse-Echo

### Day 3

#### Valves, Piping & Fitness for Service

- Valves
  - Valve Types
  - Valve Characteristics
  - Valve Applications
  - Valve Selection
  - Valve Actuators
- Piping & Pipelines
- ASME B31
- Pipe Types, construction, and Schedules
- Steel Pipes
- Welded Types and Sections
- Flanges and Gaskets
- Plastic Pipes, Composite Pipes
- Pipe Coatings and Linings
- Pipe Supports and insulation blocks
- Stress relief in Piping Design
- Pigging
- Water hammer
- Overview of API 570 - Inspection & repair of Pipelines & Piping
- API 579 overview
- Fitness for Service

### Day 4

#### Corrosion

- Corrosion Fundamentals
- Types of Corrosion
- Corrosion Inspection and Monitoring
- Corrosion Minimization
- Coatings
- Inhibitors
- Cathodic Protection

#### Compressors

- Types of Compressors - Reciprocating, Centrifugal, and Screw
- Blading and Staging



- Performance Curves
- Compressed Air Usage and instruments
- Glands and Mechanical Seals

## Day 5

### Mechanical Maintenance

- Strategies & Philosophies
  - Maintenance system optimisation
  - Maintenance Management Systems
- Condition Monitoring
- Vibration Analysis
- Shaft Alignment
- Practical Examples





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