مركز الوقت للتدريب
Time Training Center

FUNDAMENTALS OF PROCESS & MECHANICAL ENGINEERING COURSE

Introduction

This course is designed to equip learners with a comprehensive foundation in the principles of process and mechanical engineering. Ideal for early-career engineers, technicians, and recent graduates, the program introduces core technical concepts used across oil & gas, power, chemical, and manufacturing industries. Participants will explore fluid mechanics, process flow, mechanical components, instrumentation, and maintenance strategies—providing a well-rounded understanding essential for plant operations, design work, or engineering support roles.

Learning Objectives

- Interpret engineering drawings and process documents
- Explain mechanical systems and equipment functions
- Apply principles of heat transfer and fluid dynamics
- Understand process control and instrumentation basics
- Perform material selection with corrosion considerations
- Recognise maintenance and reliability practices

Course Details

Mode of Training	Classroom or Online
Duration	5 Days

Who Should Attend

- Mechanical, chemical, and process engineering students
- Junior engineers and field technicians
- Maintenance staff transitioning to design roles
- Professionals in plant operations and production support

Certificate(s)

Participants who complete a minimum of 80% of the total training hours will receive a **Certificate of Completion** issued by **Time Training Center**. This certificate reflects their active participation and commitment to professional development in the relevant field.

Course Outline

Module 1: Introduction to Engineering Disciplines

- Overview: Process vs. Mechanical Engineering roles
- Typical industry applications and interdependencies
- Key standards and codes (ASME, API, ISO, IEC)

Module 2: Engineering Fundamentals

- Units, conversions, and dimensions
- Force, stress, and strain basics
- Pressure, temperature, flow rate, and energy concepts
- Fluid properties and flow regimes (laminar/turbulent)

Module 3: Process Engineering Basics

- PFD (Process Flow Diagram) and P&ID interpretation
- Mass and energy balances
- Heat transfer (conduction, convection, radiation)
- Basic thermodynamics and process control concepts

Module 4: Mechanical Systems & Components

- Piping systems and pressure vessels
- Pumps: types, curves, and selection
- Compressors, blowers, and fans
- Heat exchangers, filters, tanks
- Valves, flanges, and supports

Module 5: Process Equipment Design & Selection

- Sizing of pipes and fittings
- Pump NPSH and system curve matching
- Heat exchanger selection criteria
- Pressure vessel design basics (ASME Sec VIII)

Module 6: Materials & Corrosion

- Common engineering materials (carbon steel, stainless, alloys)
- Material selection for process environments
- Corrosion types and prevention methods
- Coatings, linings, and cathodic protection

Module 7: Instrumentation & Control (Intro Level)

- Pressure, temperature, flow, level measurement
- Basic control loops (PID)
- Safety Instrumented Systems (SIS)
- Control valves and actuators

Module 8: Maintenance & Reliability Overview

- Preventive vs. predictive maintenance
- Mechanical failure modes
- Lubrication basics
- Vibration and thermographic analysis (overview)

Module 9: Engineering Drawings & Documentation

- Isometric and orthographic drawings
- Equipment data sheets
- Bill of Materials (BOM)
- Engineering workflow and project documents

Methodology

We employ a comprehensive and applied learning strategy, integrating theory with real-world implementation:

- **Conceptual Learning**: Expert-led sessions on catalytic theory and engineering principles
- **Interactive Workshops**: Group exercises, presentations, and technical discussion forums
- **Case-Based Learning**: Industry-specific examples and troubleshooting scenarios
- **Technology Integration**: Digital tools, simulations, and catalyst modeling applications
- **Assessment**: Pre-tests, post-tests, and Competence Validation Exams for Certified courses to ensure knowledge transfer and skills validation

Note: Instructors may adjust the training approach to fit technical requirements or participant engagement levels.

Instructors

Our instructors bring deep cross-functional expertise in mechanical and process engineering with over a decade of industry experience across utilities, oil & gas, and manufacturing sectors. They are skilled in simplifying complex technical concepts and guiding learners through real engineering scenarios and workflows. Trainer profiles, including qualifications and industry projects, will be shared upon request.

About Time Training Center

Time Training Center is a leading professional training institute in Abu Dhabi that provides students and professionals with quality education and skill development programs. Time Training Center is accredited by the Abu Dhabi Center for Technical Vocational Education & Training (ACTVET) with a specialization in Computer and Management Training programs and certified by QA QC with ISO 9001:2015.

Operating in Abu Dhabi for over 3 decades, Time Training Center has established brand value as a high-quality Management & Technical Training Center in Abu Dhabi. We have also secured strong loyalty from corporate companies and associations with our holistic and practical teaching approach.

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