



*Training Course:
Fundamentals of Process Technology*

*16 - 27 March 2025
Alexandria (Egypt)*

Training Course: Fundamentals of Process Technology

Training Course code: EN6050 From: 16 - 27 March 2025 Venue: Alexandria (Egypt) - Training Course Fees: 7585 € Euro

Introduction

Process engineering is at the heart of much of the chemical, oil, gas, and petrochemical industries. It requires familiarity not only with chemical engineering principles but also with many of the other engineering disciplines including mechanical, electrical and instrumentation. The process engineer is interested in the transportation and transformation of solids, liquids, and gases. Of specific importance are separation processes including distillation, heat transfer, hydraulics, and fluid flow, reaction engineering, but also process control and economics.

Course Objectives of Fundamentals of Process Technology

This seminar focuses on the central areas of process engineering and guides the delegates in developing both fundamental and practical understandings of key issues. Workshop examples will be drawn from the oil and gas processing, petrochemicals and chemical manufacturing industries.

The Core Competencies

Key competencies include a practical understanding of essential process units and classes of units involved in separations, heat exchange, and reactions as well as hydraulics and fluid flow. Delegates will be able to perform relevant calculations and analyses to assist in the operation, sizing, and troubleshooting.

Course Outlines of Fundamentals of Process Technology

Day 1: Introduction and Fundamentals of Process Engineering

- Process engineering basics
 - Mass and energy balances
 - Batch and continuous processes
 - Reactor types
 - Process equipment and flow diagrams
 - P&IDs
- Flammability
- Electrical area classification
- Risk Management and Hazard Studies
- Hydraulics and Fluid flow
 - Pressure and head
 - Bernoulli's theorem and its field applications
 - Flow of liquids
 - Reynolds number and pressure drop in pipes
 - Two-phase and multi-phase flow
- Enthalpy and thermodynamics
- Principle of process relief devices and process design of relief systems
- Principles of pressure vessel and piping design
- Pumps

- Compressors
- Mixers
- Mechanical Equipment - Types and application guidelines

Day 2: Heat Transfer and Reaction Engineering

- Heat Transfer
 - Thermal conductivity
 - Conduction and convection
 - Insulation
 - Heat transfer coefficients and calculation
 - Heat exchangers, type and sizing
 - Steam reboilers
 - Condensers and sub-cooling
 - Introduction to energy recovery
- Catalysis and Reaction Engineering
- Chemical reactions
- Reaction kinetics
- Introduction catalysis
- Green Chemistry and Engineering
- Reactor Design and Operation

Day 3: Distillation Processes and Equipment

- Distillation basics
 - Phase behavior and vapor/liquid equilibria
 - Gas/Liquid separation
- Distillation equipment - Columns and vessels
- Columns and vessels - Sizing and selection guidelines
- Column and vessel internals - Types and selection guidelines
- Troubleshooting of process equipment

Day 4: Separation Processes and Equipment

- Overview of Other Separation Processes
 - Absorption and adsorption
 - Amine sweetening
 - Solid Liquid separation
 - Effluent treatment [in refinery and petrochemical] industries

Day 5: Process Control and Economics

- Process Control Basics
 - Classification of control systems
 - Measured variables
 - Simple feedback control
- Process Economics
- Preliminary economic analysis
- Fixed and variable costs, break-even analysis
- Calculating raw materials usage
- Estimating the cost of process equipment and plants

Registration form on the Training Course: Fundamentals of Process Technology

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