Global Horizon
TRAINING CENTER

Training Course:
Fundamentals of Chemical Engineering

22 December 2024 - 2 January 2025
Sharm El-Sheikh (Egypt)
Sheraton Sharm Hotel

Training Course:
Fundamentals of Chemical Engineering

Training Course code: EN6027 From: 22 December 2024 - 2 January 2025 Venue: Sharm El-Sheikh (Egypt) - Sheraton Sharm Hotel Training Course Fees: 6720 Euro

Introduction

Chemical engineering is at the heart of much of the chemical, oil, gas, and petrochemical industries. The chemical engineer is interested in the transportation and transformation of solids, liquids, and gases, but must also be familiar with many of the other engineering disciplines including mechanical, electrical and instrumentation. Of specific importance are separation processes including distillation, heat transfer, hydraulics, and fluid flow, reaction engineering, but also process control and economics. These are the fundamental principles of chemical engineering.

This program considers the areas of chemical engineering that are most commonly encountered and will provide an understanding of the fundamentals to the non-specialist, and a refresher to practicing engineers, with examples that will be drawn from a range of process industries including oil and gas processing, petrochemicals, chemical manufacturing. In this program you will:

- Learn to interpret flowsheets and process flow diagrams
- Develop and understand mass and energy balances in process design
- Learn about fluid flow, pumps, and compressors, and mixing
- Discuss heat transfer equipment and their design, including heat exchangers
- Understand distillation and separations used in oil and gas processing
- Discuss effluent minimization and treatment
- Learn how to control processes
- Perform basic economic analysis of a project
- Understand the safety and environmental responsibility on process engineers

Objectives

Using case studies from the oil, gas and chemical industry to illustrate the material, participants attending the program will:

- Learn to interpret flowsheets and process flow diagrams
- Understand the use of mass and energy balances in process design
- Gain a basic understanding of fluid flow, including pumping and mixing

- Study examples relevant to the oil and gas industry
- Design a heat exchanger and know the advantages/disadvantages of different types
- Understand distillation and separations used in oil and gas processing
- Appreciate the need to control environmental pollution from industry
- Learn how to control processes
- Perform basic economic analysis of a project

Methodology

In addition to formal lectures. videos and discussions, the participants will learn by active participation through the use of problem-solving exercises, group discussions, and analysis of real-life case studies.

Outlines

Day 1:

Process Engineering Fundamentals

- Introduction
- Basic Concepts to remember
- Flow diagrams
- Piping and Instrumentation Diagrams P&IDs
- Process equipment
- Introduction to mass and energy balances
- Batch vs Continuous
- Risk Assessments and Hazard Studies
- Flammability and Electrical Area Classification
- Workshop Session

Day 2:

Fluid Flow

- Pressure and Head

- Bernoulli's Theorem
- Flow of Liquids
- Reynolds number, the pressure drop in pipes
- Compressible flow
- Introduction to Thermodynamics
- Two-phase and Multi-phase Flow
- Principle of process relief devices and process design of relief systems
- Pumps and Compressors
- Mixing and Mixers
- Workshop Session

Day 3:

Heat Transfer

- Thermal conductivity
- Conduction and convection
- Insulation
- Heat transfer coefficients
- Heat exchangers, type and sizing
- Chemical reactions
- Reaction kinetics
- Introduction to catalysis and Green Chemistry
- Workshop session

Day 4:

Introduction To Separation Processes

- Distillation basics
- Phase behavior and vapor/liquid equilibria

- Distillation Equipment
- Distillation Troubleshooting
- Gas/Liquid separation
- Absorption and adsorption
- Solid Liquid separation
- Air and water pollution control
- Effluent treatment
- Workshop Session

Day 5:

Process Control & Economics Basics

- Measured variables
- Simple feedback control
- SIS and SIL
- Process Utilities
- Air
- Water and cooling water
- Steam
- Electricity and power generation
- Process Economics
- Preliminary economic analysis
- Fixed and variable costs, break-even
- Calculating raw materials usage
- Scale-up and six-tenths rule
- Estimating the cost of process equipment and plants

Registration form on the Training Course: Fundamentals of Chemical Engineering

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Complete & Mail or fax to Global Horizon Training Center (GHTC) at the address given below

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Payment Method

- ☐ Please find enclosed a cheque made payable to Global Horizon
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