€TRAINING

Fundamentals of Chemical Engineering

17 - 21 November 2024
Sharm El-Sheikh (Egypt)

Fundamentals of Chemical Engineering

REF: KJ394 DATE: 17 - 21 November 2024 Venue: Sharm El-Sheikh (Egypt) - Fee: 4465 Euro

Introduction:

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.

Program Objectives:

At the end of this program the participants will be able to:

- Learn how 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 understand 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 and perform basic economic analysis of a project.

Targeted Audience:

- Petrochemical Engineers.
- Chemical Engineers.
- Plant Engineers.
- Consulting Engineers.
- Engineering Managers.
- Maintenance Engineers/Technicians.
- Project Engineers.
- Process Control Engineers.

Program Outlines:

Unit 1:

Process Engineering Fundamentals:

- Basic Concepts to remember ans 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.

Unit 2:

Fluid Flow:

- Introduction to Thermodynamics.
- Pressure and Head.
- Bernoulli's Theorem.
- Flow of Liquids.
- Compressible flow.
- Reynolds number and pressure drop in pipes.
- Principle of process relief devices and process design of relief systems.
- Pumps, compressors, mixing, and mixers overview.

Unit 3:

Heat Transfer:

- Thermal conductivity.
- Conduction and convection.
- Insulation.

- Heat transfer coefficients.
- Heat exchangers, type and sizing.
- Chemical reactions and Reaction kinetics.
- Introduction to catalysis and Green Chemistry.

Unit 4:

Introduction To Separation Processes:

- Distillation basics.
- Phase behavior and vapor/liquid equilibria.
- Distillation Equipment and Troubleshooting.
- Gas/Liquid separation and Solid Liquid separation.
- Absorption and adsorption.
- Air and water pollution control.
- Effluent treatment.

Unit 5: Process Control & Economics Basics:

- Measured variables and process utilities overview.
- Simple feedback control principles.
- SIS Safety Instrumented Systems and SIL Safety Integrity Level.
- Process utilities including air, water, cooling water, and steam.
- Electricity and power generation in process industries.
- Process economics and preliminary economic analysis.
- Understanding fixed and variable costs, break-even analysis.
- Techniques for calculating raw material usage, scale-up considerations, and estimating the cost of process equipment and plants.