Chemical Process Engineering Principles, Equipment, and Troubleshooting

Energy Milestones Corporation

Advancing Professionals to the next level

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Overview

This course is intended for engineers from non-chemical backgrounds who want to improve the breadth and depth of their chemical engineer ing knowledge. This course focuses on the core building blocks of chemi cal engineering systems, equipment and economics. This course identifies the areas of chemical engineering that are most commonly encountered by non-specialists, with examples drawn from a range of process industries, including oil and gas processing, petrochemicals, and chemical manufacturing.

Course Objectives

- **Interpret flow sheets and process flow diagrams**
- **Develop and understand mass and energy balances in process design**
- **Learn about fluid flow, pumps, compressors, and mixing**
- **Discuss heat transfer equipment and their design, including heat ex changers**
- **Understand distillation and separations used in oil and gas processing**
- **Discuss waste treatment minimization and treatment**
- **Learn how to control processes**
- **Perform a fundamental economic analysis of a project**
- **Understand the safety and environmental responsibility of process engi neering**

Course Content

1. Introduction

- Overview of the Chemical Processing Industry

2. Review of Process Incidents

- Safety for the Processing Industry

3. Fundamentals of Chemistry

- Description of a Hydrocarbon Molecule
- Types of Hydrocarbon Molecules
- Definition and Function of a Catalyst

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Course Content

4. Introduction to Unit Operations Equipment

- Distillation
- Absorption
- Heat Exchange
- Reactors
- Pumps
- Compressors
- Furnaces

- **5. Introduction to Fluid Flow and Mixing**
- **6. Introduction to Process Control and Instrumentation**
- **7. Introduction to the Energy and Material Balance**
- **8. Introduction to Thermodynamics and Equilibrium**
- **9. Introduction to Reaction Engineering**
- **10. Introduction to Separation and Mass Transfer Operations**
- Distillation
- Adsorption
- Crystallization
- Filtration
- Membrane
- **11. Process Operations and Troubleshooting**
- **12. Introduction to Unit Operations Economics**

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Targeted Audience

This course is designed for non-technical professionals assigned to positions in petroleum refineries, corporate offices, suppliers, and other related companies. The content of the program is based upon the assumption that those in attendance do not have formal education in engineering and chemistry and do not work in highly technical environments.

Attendance at this course will be beneficial to support personnel such as:

- Environmental professionals
- Accountants
- Business managers
- Administrative and legal staff
- Sales and marketing personnel
- Insurance representatives
- Personnel managers
- Financial professionals

Course Methodology

Facilitated by an experienced professional trainer, this training course will be conducted as a highly interactive workshop session. A variety of training methodologies and facilitation techniques will be used before and during the course whenever applicable. These methods are aimed at enhancing individual and group interaction while maximising learning. Some of these methods are:

- Online Pre-post Test
- Colourful Visual Aids
- Gamification
- Self-Assessment Instruments
- Simulations
- Case Studies
- Videos
- Group Exercises & Discussions
- Role-plays
- Indoor & Outdoor games