Introduction to Petrochemical Processing

Course general description:

Petrochemicals, essential to modern industries, are the foundation of countless products and processes. This Petrochemical Processes course delves into the industry's core, covering key processing technologies, equipment, operational parameters, and quality control. The course spans from fundamental cracking and polymerization to advanced process control, safety, and environmental aspects. Through practical case studies, participants will enhance their ability to optimize operations and uphold safety and quality standards.

Audience:

This course is designed for:

1. Chemical & Process engineers
2. Operation & Production Engineers
3. Mechanical Engineers
4. Technical and Managerial Staff those seeking to enhance their knowledge in Petrochemical Processing Fundamentals.

Course objectives:

By end of the course participants will gain:

1. Understand essential petrochemical processes.
2. Knowledge about critical equipment design, operation, and maintenance in petrochemical plants.
3. Skills on controlling operation and quality control parameters for high-quality production.
4. Apply theoretical knowledge through real-world case studies to solve operational challenges.

Course duration:

5 days

Course location:

Dubai

Course contents:

Day-1

- Pretest
- Overview of the Petrochemical Industry
- Basic petrochemicals, intermediates, and final products.
- Feedstocks and Raw Materials and other essential inputs.
- Fundamental Petrochemical Processes
    - Cracking Processes
    - **Polymerization**
    - Separation Techniques

Day-2

- Processing Technologies I: Olefins and Aromatics
- Ethylene and Propylene Production: Steam cracking of naphtha and ethane.
- Aromatics Production: Catalytic reforming, hydrodealkylation, and toluene disproportionation.
- Major Equipment: Furnaces, reactors, distillation columns, and compressors.

Day-3

- Overview Oil Separation and Treatment
- Processing Technologies II: Polymers and Derivatives
- Polyethylene and Polypropylene Production: Processes, reactors, and catalysts.

- PVC, PS, and PET Production: Process details and typical setups.
- Major Equipment: Polymerization reactors, extruders, and granulators.

Day-4

- Quality Control in Petrochemical Processes
- Quality Control Parameters: Purity, yield, and by-product management.
- Analytical Techniques: Chromatography, spectroscopy, and physical testing.
- Standards and Specifications: ASTM, ISO, and other industry standards.

Day-5

- Advanced Petrochemical Processes
- Hydroprocessing: Hydrodesulfurization (HDS), hydrocracking, and hydrotreating.
- Alkylation and Isomerization: Octane enhancement and feedstock improvement.
- Syngas and Derivatives: Methanol, ammonia, and Fischer-Tropsch synthesis.
- Emerging Technologies: Green chemistry, bio-based processes, and circular economy.
- Posttest

Methodology:

- 50% lectures & concepts
- 10% Videos
- 15% Case studies
- 15% Exercises
- 10% Discussions

Course code: (TPRS004)