

TRAINING TITLE

HYDROTREATING SYSTEM DESIGN

Training Duration

5 day

Training Venue and Dates

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| Ref. No. PE111 | Hydrotreating System Design | 5 | 29 Sep-03 Oct 2025 | \$5,500 | ABU DHABI, UAE |
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In any of the 4 or 5-star hotels. The exact venue will be informed later.

Training Fees

- \$5,500 per participant for Public Training includes Materials/Handouts, tea/coffee breaks, refreshments & Lunch

Training Certificate

Define Management Consultants Certificate of course completion will be issued to all attendees.

TRAINING DESCRIPTION

Hydrotreating is a critical process in the refining industry, enabling the removal of impurities such as sulfur, nitrogen, and metals from hydrocarbon streams. It plays a pivotal role in producing clean fuels, improving product quality, and meeting increasingly stringent environmental regulations. Designing efficient and reliable hydrotreating systems is essential to ensure operational performance, compliance, and cost-effectiveness in refinery operations.

This 5-day course provides a comprehensive exploration of hydrotreating system design, covering everything from fundamental principles and catalytic reactions to equipment design and process optimization. Through interactive lectures, and real-world case studies, participants will develop the skills necessary to design, operate, and troubleshoot hydrotreating systems that meet today's operational and regulatory challenges.

TRAINING OBJECTIVES

By the end of the course, participants will be able to understand

- Gain a solid understanding of hydrotreating chemistry and process principles.
- Learn how to design and size hydrotreating reactors and supporting equipment.
- Understand catalyst selection, management, and performance optimization.
- Explore troubleshooting strategies for operational issues and catalyst deactivation.

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- Evaluate energy efficiency and economic considerations in hydrotreating system design.
- Get hands-on experience through simulation exercises and case studies.

WHO SHOULD ATTEND?

This course is ideal for:

- Process engineers and designers in refining operations.
- Refinery production and operations personnel.
- Maintenance and reliability professionals.
- Project engineers managing hydrotreating projects.
- Environmental and compliance specialists.

TRAINING METHODOLOGY

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions and motivating everybody to find the right answers. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.

Very useful Course Materials will be given.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work & Practical Exercises
- 20% Videos & General Discussions

COURSE PROGRAM:

Day 1: Fundamentals of Hydrotreating

- Overview of Hydrotreating in the Refining Process
- Feedstock Properties and Challenges: Crude Oil, Gasoline, Diesel, and Kerosene
- Key Objectives: Sulfur Removal, Nitrogen Removal, and Saturation of Aromatics
- Catalytic Chemistry of Hydrotreating: Hydrogenation and Hydrodesulfurization
- Introduction to Hydrotreating Reactor Design and Flow Patterns
- Case Study: Role of Hydrotreating in Producing Low-Sulfur Fuels

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Day 2: Process and Equipment Design

- Hydrotreating Process Flow Diagrams (PFDs)
- Key Equipment Design: Reactors, Heat Exchangers, and Furnaces
- Hydrogen Supply and Management in Hydrotreating Units
- Catalyst Selection: Types, Properties, and Performance Considerations
- Reactor Design and Sizing Fundamentals
- Case Study: Designing a Diesel Hydrotreating Unit

Day 3: Operational Considerations and Optimization

- Start-Up and Shut-Down Procedures for Hydrotreating Units
- Process Variables: Temperature, Pressure, and Space Velocity
- Managing Catalyst Activity and Deactivation
- Troubleshooting Common Operational Issues in Hydrotreating Systems
- Process Optimization Techniques for Yield and Efficiency
- Optimizing Hydrotreating Performance Using Simulation Tools

Day 4: Environmental and Economic Considerations

- Emissions Control in Hydrotreating: Sulfur Recovery and Hydrogen Sulfide Management
- Environmental Regulations and Compliance Standards
- Energy Efficiency and Heat Integration in Hydrotreating Units
- Economic Analysis: CAPEX and OPEX Considerations for Hydrotreating Systems
- Case Study: Evaluating the Cost-Benefit of Upgrading Hydrotreating Units
- Designing an Energy-Efficient Hydrotreating System

Day 5: Advanced Topics and Integrated Systems

- Integration of Hydrotreating with Other Refinery Units (e.g., FCC, Hydrocracking)
- Emerging Technologies in Hydrotreating: Novel Catalysts and Process Intensification
- Digital Transformation in Hydrotreating: IoT, Automation, and Predictive Maintenance
- Developing a Comprehensive Design for a Hydrotreating System
- Review of Key Concepts and Best Practices
- Course Assessment, Feedback, and Closing Remarks

NOTE:

Pre-& Post Tests will be conducted.

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Case Studies, Group Exercises, Group Discussions, Last Day reviews, and assessments will be carried out.

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