Petrochemical Process Engineering Training Course

Professional Development Training Course Outline

Category	General Training	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

The Petrochemical Process Engineering Training Course is designed to equip learners with advanced knowledge of refining technologies, process optimization, plant operations, and petrochemical production systems. This training delivers in-depth exposure to upstream and downstream processes, hydrocarbon processing, refinery operations, safety standards, and energy-efficient process design aligned with modern oil and gas industry requirements. Participants gain practical insights into process simulation, troubleshooting, plant performance improvement, and digital transformation in petrochemical engineering.

This course is structured to bridge the gap between academic theory and real-world industrial application in oil refining, gas processing, and chemical manufacturing sectors. With a strong focus on operational excellence, sustainability, automation, and process safety management (PSM), learners are prepared to meet global energy industry demands. The program integrates case-based learning, refinery simulations, and real-time engineering scenarios to build highly skilled professionals capable of optimizing petrochemical plant performance and ensuring safe, efficient, and profitable operations.

Programme Curriculum

Petrochemical Process Engineering Training Course

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Course Objectives

1. Understand fundamentals of petrochemical process engineering and refinery operations
2. Master crude oil refining processes and hydrocarbon conversion technologies
3. Develop skills in process flow diagram (PFD) and P&ID interpretation
4. Apply process simulation tools
5. Enhance knowledge of distillation, cracking, reforming, and separation processes
6. Improve process optimization and energy efficiency techniques
7. Strengthen process safety management (PSM) and HAZOP analysis
8. Learn equipment design for heat exchangers, reactors, and columns
9. Gain expertise in plant troubleshooting and operational diagnostics
10. Understand petrochemical plant automation and digital transformation
11. Implement sustainability practices in refinery and petrochemical systems
12. Develop competence in quality control and process monitoring systems
13. Build capability in industrial case study analysis and decision-making

Target Audience

1. Chemical and Petrochemical Engineers
2. Process Engineers in Oil & Gas Industry
3. Refinery Operations Technicians
4. Mechanical Engineers in Process Plants
5. Energy and Sustainability Consultants
6. Industrial Safety and HSE Professionals
7. Graduate Engineering Students
8. Project Engineers and Plant Managers

Course Modules

Module 1: Introduction to Petrochemical Industry

- Overview of global oil & gas value chain
- Upstream, midstream, downstream integration
- Major petrochemical products and applications
- Industry standards and regulatory frameworks
- **Case Study:** Global refinery integration model (Middle East mega-refinery operations)

Module 2: Crude Oil Refining Processes

- Atmospheric and vacuum distillation
- Thermal and catalytic cracking

- Hydroprocessing and reforming units
- Product yield optimization techniques
- **Case Study:** Optimization of diesel yield in a large-scale refinery

Module 3: Process Simulation & Modeling

- Introduction to Aspen HYSYS and Aspen Plus
- Steady-state and dynamic simulations
- Process modeling for refinery units
- Sensitivity and optimization analysis
- **Case Study:** Simulation of naphtha reforming unit for efficiency improvement

Module 4: Chemical Reaction Engineering in Petrochemicals

- Reactor design principles
- Catalytic reaction systems
- Kinetics and reaction mechanisms
- Industrial reactor optimization
- **Case Study:** Ethylene production optimization in steam cracking unit

Module 5: Heat Transfer & Mass Transfer Operations

- Heat exchanger design and analysis
- Distillation column operations
- Absorption and stripping processes
- Membrane and separation technologies
- **Case Study:** Energy recovery in heat exchanger networks in refinery

Module 6: Process Safety & Risk Management (PSM)

- Hazard identification (HAZID) and HAZOP studies
- Safety instrumented systems (SIS)
- Risk assessment methodologies
- Emergency response planning
- **Case Study:** Accident prevention in LNG processing plant using HAZOP

Module 7: Plant Operations & Troubleshooting

- Operational diagnostics techniques
- Equipment failure analysis
- Process bottleneck identification
- Maintenance strategies
- **Case Study:** Compressor failure troubleshooting in gas processing plant

Module 8: Digital Transformation in Petrochemical Engineering

- Industry 4.0 in oil and gas
- IoT-enabled plant monitoring systems
- AI and machine learning in process optimization
- Digital twins for refinery operations
- **Case Study:** Smart refinery implementation using predictive analytics

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
21 Sep 2026	25 Sep 2026	Online	$1,000
21 Sep 2026	25 Sep 2026	Physical	$1,500
21 Sep 2026	25 Sep 2026	Physical	$0

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21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0

Ready to enroll or request a customized program? Book online or contact us:

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