Petroleum Refinery Operations 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 Petroleum Refinery Operations Training Course is designed to equip learners with advanced knowledge and practical skills in modern refinery systems. As global energy demand continues to evolve, the need for highly skilled refinery operators has become critical in ensuring process optimization, operational efficiency, safety compliance, and sustainable fuel production. This course integrates real-world refinery workflows including crude oil distillation, catalytic cracking, hydroprocessing, and product blending, aligned with current Industry 4.0 digital refinery technologies and automation trends.

This training also emphasizes process safety management (PSM), environmental sustainability, energy efficiency, and emissions control, ensuring learners are prepared for high-performance roles in downstream petroleum industries. Participants gain hands-on understanding of DCS/SCADA systems, predictive maintenance, refinery troubleshooting, and operational decision-making under dynamic plant conditions. The course is ideal for building competency in oil and gas downstream operations, refinery asset management, and smart refinery transformation strategies.

Programme Curriculum

Petroleum Refinery Operations Training Course

Introduction

The Petroleum Refinery Operations Training Course is designed to equip learners with advanced knowledge and practical skills in modern refinery systems. As global energy demand continues to evolve, the need for highly skilled refinery operators has become critical in ensuring process optimization, operational efficiency, safety compliance, and sustainable fuel production. This course integrates real-world refinery workflows including crude oil distillation, catalytic cracking, hydroprocessing, and product blending, aligned with current Industry 4.0 digital refinery technologies and automation trends.

This training also emphasizes process safety management (PSM), environmental sustainability, energy efficiency, and emissions control, ensuring learners are prepared for high-performance roles in downstream petroleum industries. Participants gain hands-on understanding of DCS/SCADA systems, predictive maintenance, refinery troubleshooting, and operational decision-making under dynamic plant conditions. The course is ideal for building competency in oil and gas downstream operations, refinery asset management, and smart refinery transformation strategies.

Course Duration

5 days

Course Objectives

1. Master crude oil refining processes and downstream operations
2. Understand refinery process flow diagrams (PFD) and P&ID interpretation
3. Apply advanced process control (APC) in refinery systems
4. Develop expertise in distillation, cracking, reforming, and treating units
5. Implement process safety management (PSM) and HAZOP analysis
6. Enhance skills in DCS, SCADA, and refinery automation systems
7. Optimize energy efficiency and heat integration in refineries
8. Strengthen troubleshooting and root cause analysis (RCA) techniques
9. Apply predictive and preventive maintenance strategies
10. Ensure environmental compliance and emissions reduction
11. Improve refinery production planning and scheduling
12. Understand hydrocarbon accounting and quality control systems
13. Build capability in digital refinery transformation and smart operations

Target Audience

1. Refinery process operators
2. Petroleum engineers
3. Chemical engineers
4. Maintenance technicians
5. Plant supervisors and shift managers
6. HSE (Health, Safety & Environment) officers
7. Energy consultants and analysts
8. Graduates entering downstream oil & gas industry

Course Modules

Module 1: Introduction to Petroleum Refining Systems

- Overview of upstream vs downstream operations
- Crude oil properties and classification
- Refinery configuration
- Product slate-LPG, gasoline, diesel, jet fuel
- Case Study: Configuration comparison of simple vs complex refinery

Module 2: Crude Oil Distillation & Separation Processes

- Atmospheric and vacuum distillation units
- Fractionation principles and tower operations

- Heat exchange networks
- Cut point optimization
- Case Study: Optimization of CDU throughput in a mid-size refinery

Module 3: Conversion Processes (Cracking & Reforming)

- Fluid catalytic cracking (FCC)
- Hydrocracking fundamentals
- Catalytic reforming processes
- Yield optimization strategies
- Case Study: Improving gasoline yield through FCC catalyst adjustment

Module 4: Treating & Product Upgrading Units

- Hydrodesulfurization (HDS)
- Sweetening processes
- Hydrogen management systems
- Product quality improvement techniques
- Case Study: Sulfur reduction compliance in diesel production

Module 5: Refinery Process Control Systems

- DCS and SCADA architecture
- Instrumentation and control loops
- Advanced Process Control (APC) systems
- Alarm management and control room operations
- Case Study: Reducing plant upsets using APC optimization

Module 6: Refinery Safety, HSE & Risk Management

- Process Safety Management (PSM) framework
- HAZOP and risk assessment techniques
- Fire and explosion prevention systems
- Emergency response planning
- Case Study: Root cause analysis of refinery incident prevention

Module 7: Maintenance, Reliability & Asset Integrity

- Predictive maintenance tools
- Equipment reliability strategies
- Turnaround planning and shutdown management
- Corrosion control and inspection systems
- Case Study: Extending pump lifecycle through predictive maintenance

Module 8: Digital Refinery & Sustainability Optimization

- Industry 4.0 in oil refineries
- AI and data analytics in operations
- Energy optimization systems
- Carbon footprint reduction strategies
- Case Study: Digital twin implementation for refinery efficiency improvement

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
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

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

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com