Training Course on Refinery Process Yield Optimisation

Professional Development Training Course Outline

Category	Engineering	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Unlock the full potential of your refinery operations with our comprehensive **Refinery Process Yield Optimisation** training course. In today's competitive energy landscape, maximizing output while minimizing costs is paramount. Training Course on Refinery Process Yield Optimisation equips participants with the essential knowledge and practical skills to implement cutting-edge techniques in **process improvement**, **production efficiency**, and **resource management**. Learn how to leverage data-driven strategies and industry best practices to achieve significant gains in **yield enhancement** and overall profitability.

This dynamic training goes beyond theoretical concepts, providing real-world case studies and actionable insights into **catalyst management**, **distillation column optimisation**, and **crude oil processing**. Participants will gain expertise in identifying bottlenecks, implementing effective control strategies, and utilizing advanced analytical tools for continuous **performance monitoring** and **operational excellence**. Join us to transform your refinery's performance and contribute directly to increased **profitability**, reduced **waste**, and sustainable **energy efficiency**.

Programme Curriculum

Training Course on Refinery Process Yield Optimisation

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Course Objectives

1. Master the fundamentals of **refinery economics** and their direct impact on yield optimisation.
2. Implement advanced techniques for **crude oil assay analysis** to maximise feedstock value.
3. Apply statistical process control (SPC) for real-time **quality monitoring** and consistency.
4. Optimise **distillation column operation** to improve product separation and reduce losses.
5. Develop strategies for effective **catalyst management** and performance enhancement.
6. Identify and mitigate common causes of **yield loss** in key refinery processes.
7. Utilise **process simulation software** for scenario analysis and optimisation.
8. Implement best practices in **energy efficiency** to reduce operational costs.
9. Apply **lean manufacturing principles** to streamline refinery workflows.
10. Leverage **advanced process control (APC)** for stable and optimised operations.
11. Conduct thorough **process troubleshooting** to identify and resolve yield-limiting factors.
12. Implement strategies for minimising **waste generation** and promoting circular economy principles in refining.
13. Develop key performance indicators (KPIs) for continuous **yield improvement** and performance tracking.

Organisational Benefits

- Increased **profitability** through higher product yields.
- Reduced operational costs due to improved **energy efficiency** and resource utilisation.
- Enhanced **operational excellence** and process stability.
- Improved product **quality** and consistency.
- Better decision-making based on data-driven insights.
- Development of a highly skilled and knowledgeable workforce.
- Reduced **environmental impact** through minimised waste and emissions.
- Enhanced competitiveness in the global energy market.

Target Audience

1. Process Engineers
2. Operations Managers
3. Chemical Engineers
4. Refinery Technicians
5. Production Planners
6. Maintenance Engineers
7. Technical Managers
8. Anyone involved in improving refinery efficiency and profitability

Course Outline

Module 1: Introduction to Refinery Economics and Yield

- Understanding key refinery profitability metrics.
- The impact of yield on overall financial performance.
- Different types of yields and their calculations.
- Identifying factors affecting refinery margins.
- **Case Study:** Analysis of a refinery's profitability improvement through yield enhancement.

Module 2: Crude Oil Characterisation and Feedstock Selection

- Understanding crude oil assays and their significance.
- Impact of crude oil properties on refinery processes and yields.
- Strategies for optimal feedstock selection and blending.
- Economic evaluation of different crude oil slates.
- **Case Study:** A refinery's strategic decision on crude oil sourcing for maximum yield.

Module 3: Distillation Column Optimisation

- Principles of fractional distillation and separation efficiency.
- Identifying and addressing common column operational issues.
- Advanced control strategies for improved separation.
- Techniques for minimising reflux ratio and energy consumption.
- **Case Study:** Implementing advanced control on a crude distillation unit to increase light product yield.

Module 4: Catalytic Cracking Unit (CCU) Optimisation

- Understanding CCU chemistry and catalyst types.
- Factors affecting conversion, selectivity, and yield.
- Optimising reactor conditions and catalyst management.
- Strategies for maximising valuable product yields (e.g., gasoline, propylene).
- **Case Study:** Optimising catalyst regeneration in a CCU to improve gasoline yield.

Module 5: Hydroprocessing Unit Optimisation (Hydrotreating, Hydrocracking)

- Fundamentals of hydrotreating and hydrocracking reactions.
- Impact of catalyst properties and operating conditions on product quality and yield.
- Optimising hydrogen consumption and reactor performance.
- Strategies for maximising distillate and jet fuel yields.
- **Case Study:** Improving middle distillate yield through hydrocracking unit optimisation.

Module 6: Catalytic Reforming Unit Optimisation

- Reforming reactions and their impact on gasoline octane.
- Catalyst selection and management for optimal performance.
- Optimising reactor conditions to maximise aromatics production.
- Strategies for balancing octane enhancement and liquid yield.
- **Case Study:** Adjusting reforming unit operating parameters to meet gasoline pool octane targets efficiently.

Module 7: Catalyst Management and Performance Monitoring

- Understanding catalyst deactivation mechanisms.
- Best practices for catalyst handling, loading, and unloading.

- Techniques for monitoring catalyst performance and predicting lifespan.
- Economic evaluation of catalyst replacement strategies.
- **Case Study:** Implementing a proactive catalyst monitoring program to prevent yield decline.

Module 8: Energy Efficiency and Heat Integration

- Identifying major energy consumers in a refinery.
- Principles of heat integration and waste heat recovery.
- Optimising heat exchanger network performance.
- Strategies for reducing fuel gas consumption and utility costs.
- **Case Study:** Implementing a heat integration project to significantly reduce energy consumption.

Module 9: Process Control and Instrumentation for Yield Optimisation

- The role of advanced process control (APC) in yield improvement.
- Utilising real-time data for process monitoring and adjustment.
- Implementing model predictive control (MPC) for stable and optimised operation.
- Advanced instrumentation for accurate measurement and control.
- **Case Study:** Implementing MPC on a distillation column to improve stability and yield.

Module 10: Statistical Process Control (SPC) and Quality Monitoring

- Applying SPC tools for monitoring process variability.
- Identifying and addressing sources of product quality deviations.
- Using statistical analysis for continuous improvement.
- Implementing online analysers for real-time quality monitoring.
- **Case Study:** Using SPC to reduce variability in a product specification and improve yield.

Module 11: Process Troubleshooting and Root Cause Analysis

- Systematic approaches to identifying and resolving process issues.
- Utilising root cause analysis techniques (e.g., 5 Whys, Fishbone diagrams).
- Developing effective troubleshooting strategies for yield losses.
- Learning from past operational incidents and near misses.
- **Case Study:** Investigating and resolving a persistent low yield issue in a specific process unit.

Module 12: Waste Management and By-Product Valorisation

- Identifying and quantifying different types of refinery waste streams.
- Strategies for minimising waste generation and promoting recycling.
- Exploring opportunities for by-product valorisation and revenue generation.
- Environmental regulations and sustainable waste management practices.
- **Case Study:** Implementing a project to convert a refinery waste stream into a valuable product.

Module 13: Lean Manufacturing and Operational Excellence in Refining

- Applying lean principles to streamline refinery processes.
- Identifying and eliminating waste (muda) in operations.
- Implementing continuous improvement methodologies (e.g., Kaizen).
- Fostering a culture of operational excellence.
- **Case Study:** Using lean techniques to improve turnaround efficiency and reduce downtime.

Module 14: Process Simulation and Optimisation Tools

- Introduction to process simulation software (e.g., Aspen HYSYS, Petro-SIM).
- Developing and utilising process models for scenario analysis.
- Identifying optimisation opportunities through simulation studies.
- Integrating simulation results with operational decisions.
- **Case Study:** Using process simulation to evaluate different operating conditions for yield improvement.

Module 15: Yield Accounting and Performance Monitoring Systems

- Establishing accurate yield accounting methodologies.
- Developing key performance indicators (KPIs) for yield monitoring.
- Implementing data management and reporting systems.
- Utilising performance dashboards for real-time insights.
- **Case Study:** Implementing a comprehensive yield accounting system to track and improve performance.

Training Methodology

Our training methodology incorporates a blend of:

- **Interactive Lectures:** Engaging presentations with real-world examples.
- **Group Discussions:** Collaborative problem-solving and knowledge sharing.
- **Practical Exercises:** Hands-on application of concepts and tools.
- **Case Study Analysis:** In-depth examination of real refinery scenarios.
- **Simulation Activities:** Using software to model and optimise processes.
- **Q&A Sessions:** Direct interaction with experienced instructors.

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	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

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