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COURSE BROCHURE

Refinery Process Yields Optimisation Advanced Training Course

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Registered in the United Kingdom and Saudi Arabia

Refinery Process Yields Optimisation Advanced Training Course

Refinery Process Yields Optimisation is a 2-week advanced training course for refinery process engineers, planners and operations supervisors, and each participant builds a yield improvement case for one refinery unit. Narrow cracking margins, changing crude slates and tighter product specifications mean every percentage point of distillate or gasoline recovered from the barrel now matters to profitability. Jupiter Prime Training offers Refinery Process Yields Optimisation to cohorts from fuels refineries and integrated petrochemical complexes.

Why Refinery Process Yields Optimisation Matters Now

Refiners face three converging pressures: volatile crude differentials that reward plants able to process heavier or opportunity crudes, product markets shifting from fuel oil towards middle distillates and petrochemical feedstocks, and lower-sulphur specifications that load hydrotreaters and hydrogen systems. A refinery that runs to habit leaves margin in the bottom of the barrel, gives away octane and cetane, and misses the best crude purchases; one that manages yields deliberately captures value on every cargo. The course refers to refinery equipment and practice standards published by the American Petroleum Institute API and treats crude quality data consistently from assay to planning model.

Who Gains Most from Refinery Process Yields Optimisation

- Process engineers responsible for crude, vacuum and conversion unit performance
- Planning and scheduling engineers who maintain the refinery linear programming model
- Operations supervisors who set unit targets and respond to daily constraints
- Crude and feedstock selection specialists who evaluate cargoes against plant capability
- Blending and product quality engineers who certify gasoline, diesel and jet batches

A refinery that sends process, planning and blending engineers together gains most, because the planning model, the units and the tank farm finally speak the same language.

Refinery Process Yields Optimisation Capabilities

Participants learn to follow a crude from assay sheet through distillation cuts, conversion units and blend headers, and to put a margin on each operating choice.

- Assess crude assays and cut-point data for plant fit — crude purchase and selection decisions
- Calculate the yield and margin effect of changing cut points — operations and planning targets
- Weigh conversion unit severity against catalyst life and product quality — unit engineers and supervisors
- Build and test linear programming vectors for refinery planning — monthly and weekly plans

- Design blend recipes that minimise quality giveaway — product certification and sales
- Communicate a yield improvement case with margin, risk and cost — refinery management

Key Refinery Process Yields Optimisation Terms

- Crude assay — laboratory data describing a crude's distillation curve, sulphur, metals and properties of each boiling-range cut.
- Cut point — the temperature at which one distillation product ends and the next begins, shifting volume between products.
- Conversion unit — a process such as a fluid catalytic cracker or hydrocracker that turns heavy fractions into lighter, higher-value products.
- Linear programming model — a mathematical refinery model that selects crudes, unit rates and blends to maximise margin within constraints.
- Quality giveaway — product quality delivered above specification, such as excess octane, that earns no extra revenue.
- Gross refining margin — the value of products sold minus the cost of crude and feedstocks, before operating costs.

Refinery Process Yields Optimisation Day by Day

Day 1: Refinery Economics and Configuration

- Refinery Configurations From Hydroskimming to Deep Conversion — Yield Potential Compared
- Gross Refining Margin Build-Up — Crude Cost Against Product Values
- Product Market Shifts — Middle Distillate and Petrochemical Feedstock Demand
- Integration With Petrochemical Units — Naphtha, Propylene and Aromatics Routes
- Yield Accounting and Mass Balance — Measuring Losses Across the Site

Day 2: Crude Assay Evaluation

- Assay Data Structure and Quality — True Boiling Point Curves and Cut Properties
- Crude Compatibility and Blending — Avoiding Asphaltene Precipitation
- Contaminants and Metals — Impact on Catalysts and Corrosion
- Crude Valuation Methods — Netback and Breakeven Values per Cargo
- Opportunity Crude Screening — Discounted Grades Against Plant Limits

Day 3: Crude and Vacuum Distillation Yields

- Atmospheric Column Cut-Point Optimisation — Shifting Volume Into Diesel and Kerosene
- Fractionation Efficiency and Overlap — Reducing Product Gaps and Tails
- Vacuum Unit Deep Cut Operation — Raising Gas Oil Recovery
- Preheat Train and Furnace Limits — Throughput Versus Energy Trade-Offs
- Desalter Performance — Protecting Downstream Units From Salts

Day 4: Fluid Catalytic Cracking Yields

- Feed Quality and Pretreatment — Effect on Conversion and Coke
- Reactor Severity and Catalyst-to-Oil Ratio — Gasoline Versus Light Olefins
- Catalyst Selection and Additives — Propylene, Octane and Bottoms Upgrading
- Heat Balance and Regenerator Constraints — Limits on Throughput
- Yield Shift Monitoring — Test Runs and Data Reconciliation

Day 5: Hydroprocessing and Residue Upgrading

- Hydrocracker Conversion and Selectivity — Maximising Middle Distillate Yield
- Hydrotreater Severity for Low-Sulphur Products — Hydrogen and Catalyst Life
- Hydrogen Network Balance — Allocating Hydrogen to Highest Value
- Delayed Coking and Visbreaking — Bottom of the Barrel Options
- Catalyst Cycle Planning — Timing Changeouts Against Margin

Day 6: Reforming, Isomerisation and Light Ends

- Catalytic Reformer Severity — Octane, Hydrogen and Aromatics Yield
- Isomerisation and Alkylation Units — Clean Octane for Gasoline Pools
- Light Ends Recovery — Liquefied Petroleum Gas and Fuel Gas Losses
- Naphtha Routing Decisions — Gasoline Pool Versus Petrochemical Feed
- Flare and Loss Minimisation — Recovering Hidden Hydrocarbon Value

Day 7: Linear Programming for Refinery Planning

- Planning Model Structure — Crude, Unit, Blend and Product Submodels
- Base and Shift Vectors — Representing Unit Yields Accurately
- Constraints and Marginal Values — Reading Shadow Prices for Decisions
- Crude Selection Runs — Ranking Cargoes by Incremental Margin
- Model Back-Casting — Comparing Plan With Actual Performance

Day 8: Product Blending and Quality Giveaway

- Gasoline Blending Rules — Octane, Vapour Pressure and Distillation
- Diesel and Jet Blending — Cetane, Cold Flow and Flash Point
- Blend Optimisation Software — Recipe Setting and Online Analysers
- Giveaway Measurement and Reduction — Capturing Lost Quality Value
- Tankage and Scheduling Constraints — Feasible Blend Plans

Day 9: Margin Optimisation and Operational Excellence

- Advanced Process Control on Key Units — Pushing Constraints Safely
- Real-Time Optimisation and Digital Twins — Closing the Plan-to-Plant Gap
- Energy Efficiency and Yield Trade-Offs — Fuel Cost Against Recovery
- Reliability Effects on Yield — Unplanned Shutdowns and Slowdowns
- Margin Improvement Governance — Tracking Initiatives to Confirmed Benefit

Day 10: Practising the Refinery Unit Yield Improvement Case

- Crude and Cut-Point Baseline — Applying Days 2 and 3 to a Unit
- Conversion Unit Opportunity Sizing — Applying Days 4 and 5
- Planning Model Test — Applying Day 7 to the Proposed Change
- Blend and Giveaway Check — Applying Day 8 to Product Pools
- Refinery Unit Yield Improvement Case — Margin, Risk and Implementation Plan

Applying Refinery Process Yields Optimisation After the Course

- Run a cut-point sensitivity study on the atmospheric or vacuum column and present the margin effect to the planning meeting.
- Compare last month's linear programming plan with actual unit yields and update the shift vectors that drifted most.

Refinery Process Yields Optimisation Questions FAQ

What is refinery process yields optimisation and why does it matter now?

It is the discipline of choosing crudes, cut points, unit severities and blends to maximise valuable products from each barrel. Narrow margins, shifting product demand and tighter specifications make every yield gain directly visible in refinery profit.

Which roles gain most from refinery process yields optimisation training?

Process engineers, planning engineers, operations supervisors, crude selection specialists and blending engineers gain most. Together they control the decisions that move volume between low-value and high-value products.

How does refinery process yields optimisation differ from a general refinery operations course?

It focuses on economic decisions rather than equipment operation. A general refinery operations course explains how units run safely, while this course connects assays, cut points, conversion severity, linear programming and blending to margin.

What do you bring back from refinery process yields optimisation training?

You bring back a yield improvement case for one refinery unit. It holds a crude and cut-point baseline, sized conversion opportunities, a planning model test and a blend check with margin and implementation steps.

Refinery Process Yields Optimisation: The Way Forward

The refinery unit yield improvement case gives each participant a quantified proposal tested against the planning model and blend constraints. Its first use is the next monthly planning cycle, where the planning manager and operations superintendent decide whether to trial the change. After the trial, revisit the shift vectors and giveaway figures, because crude slates and catalyst condition keep moving.