JUPITER PRIME

Consulting • Training • Advisory

جوبيتر برايم للاستشارات والتدريب

COURSE BROCHURE

Process Plant Optimisation and Continual Improvement Training Course

4 – 8 April 2027
Muscat

jupiterprime.uk

info@jupiterprime.uk

Registered in the United Kingdom and Saudi Arabia

Process Plant Optimisation and Continual Improvement Training Course

Ref: 842_31979 **Date:** 4 – 8 April 2027 **Location:** Muscat **Fees:** 6500 GBP

Process Plant Optimisation and Continual Improvement is a 1-week training course for process engineers, plant operators and continuous improvement leads who raise yield, cut energy use and remove bottlenecks in continuous and batch plants, and who leave with a Plant Optimisation Improvement Plan for their own unit. Tighter margins, energy costs and emissions targets now make every percentage point of yield matter. Jupiter Prime Training delivers this course for engineers who carry that responsibility.

Why Process Plant Optimisation and Continual Improvement Matter Now

Three forces drive process plant optimisation today: volatile feedstock and utility costs that squeeze margins, decarbonisation commitments that put furnaces, boilers and compressors under scrutiny, and an ageing workforce whose operating know-how must be turned into written operating envelopes. Plants that run close to their true limits sell more on-specification product per tonne of feed, while plants that drift lose yield, burn excess fuel and absorb unplanned slowdowns. The course draws on the Plan-Do-Check-Act PDCA cycle, the DMAIC improvement sequence from Six Sigma, pinch analysis for heat integration and the Theory of Constraints TOC for debottlenecking.

Who Gains Most from Process Plant Optimisation and Continual Improvement

- Engineers responsible for unit performance, heat and material balances and operating targets
- Console and field operators who hold units within their operating envelope shift by shift
- Improvement leads who run DMAIC projects and track savings across the site
- Energy coordinators who monitor fuel, steam and power intensity
- Control engineers who tune loops and maintain advanced process control applications

A unit group that sends its process engineer, senior operator and control engineer together gains most, since benchmark gaps, constraints and control changes can then be agreed on one shared heat and material balance.

Process Plant Optimisation and Continual Improvement Capabilities

Participants learn to locate the gap between actual and achievable unit performance, choose the cheapest lever to close it and lock in the gain through operating envelopes and control.

- Calculate key performance indicators such as specific energy consumption and yield per pass — site benchmarking decisions
- Build a reconciled heat and material balance for one unit — optimisation targets agreed with operations
- Apply pinch analysis to identify heat recovery opportunities — energy project prioritisation
- Assess unit constraints and debottlenecking options — throughput investment choices
- Specify control loop and advanced process control improvements — operating stability and margin capture
- Design a PDCA review cadence for sustained gains — plant management and shift teams

Key Process Plant Optimisation and Continual Improvement Terms

- Operating envelope — the safe and economic range of temperatures, pressures and flows within which a unit is run.
- Specific energy consumption — energy used per tonne of product, the main yardstick for comparing unit energy performance.
- Pinch analysis — a method that matches hot and cold streams to find the minimum external heating and cooling a process needs.
- Debottlenecking — identifying and relieving the equipment or process limit that caps unit throughput.
- Advanced process control — multivariable control that pushes a unit towards its constraints more consistently than single loops.
- DMAIC — Define, Measure, Analyse, Improve and Control, a structured sequence for data-based improvement projects.

Process Plant Optimisation and Continual Improvement Day by Day

Day 1: Benchmarking Unit Performance

- Margin and Energy Pressures on Process Plants — Where Optimisation Pays First
- Unit Key Performance Indicator Set — Yield, Energy and Availability Measures
- Heat and Material Balance Reconciliation — Trustworthy Baseline Before Targets
- Internal and Peer Benchmarking — Gap to Achievable Performance
- Operating Envelope Documentation — Capturing Operator Know-How Before Retirement

Day 2: Energy and Yield Optimisation

- Pinch Analysis and Composite Curves — Heat Recovery Targets
- Furnace and Boiler Efficiency Checks — Excess Air and Stack Losses
- Steam and Condensate System Survey — Trap Losses and Letdown Choices
- Yield and Selectivity Analysis — Reactor Conditions and Catalyst Life
- Utility Cost Allocation Model — Pricing Energy Savings for Approval

Day 3: Control and Debottlenecking

- Control Loop Performance Assessment — Oscillation, Saturation and Tuning Needs
- Advanced Process Control Basics — Constraint Pushing and Benefit Estimation
- Constraint Identification Across Equipment — Pumps, Exchangers and Columns
- Debottlenecking Option Screening — Operational Versus Capital Remedies
- Process Simulation Case Studies — Testing Throughput Increases Safely

Day 4: Continual Improvement Cycles

- DMAIC Project Charter — Scoping Improvement on One Unit
- Statistical Process Control Charts — Separating Drift From Normal Variation
- PDCA Review Cadence — Daily, Weekly and Monthly Performance Meetings
- Management of Change Screening — Safety Review of Optimisation Moves
- Savings Tracking Register — Verifying and Sustaining Realised Gains

Day 5: Practising the Plant Optimisation Improvement Plan

- Unit Gap Assessment — Applying Benchmarking and Balance Findings
- Energy and Yield Opportunity List — Applying Pinch and Selectivity Results
- Constraint and Control Action Set — Applying Debottlenecking and Control Findings
- Peer Review of Proposed Actions — Risk, Cost and Benefit Challenge
- Plant Optimisation Improvement Plan — Ranked Actions, Owners and Targets

Applying Process Plant Optimisation and Continual Improvement After the Course

- Reconcile the heat and material balance for one unit and publish a specific energy consumption baseline.
- Launch a DMAIC project on the largest yield or energy gap found and set up its control chart.

Process Plant Optimisation and Continual Improvement Questions FAQ

What is process plant optimisation and continual improvement and why does it matter now?

It is the practice of running process units closer to their achievable yield, energy and throughput limits and keeping them there. It matters now because energy costs, emissions targets and tight margins reward refineries, chemical plants and food processors that remove avoidable losses.

Which roles gain most from process plant optimisation training?

Process engineers, plant operators and continuous improvement leads gain most. Energy coordinators and control engineers also benefit, particularly when they attend with the process engineers whose units they support.

How does this process plant optimisation course differ from a plant troubleshooting course?

It improves units that are running normally rather than diagnosing failures. A troubleshooting course investigates upsets and equipment faults, while this course benchmarks performance, optimises energy and yield, relieves constraints and builds improvement routines.

What do you bring back from process plant optimisation and continual improvement training?

You bring back a ranked set of energy, yield, control and debottlenecking actions for your own unit. Each action has an owner, a target and a tracking method, ready for review with plant management.

Process Plant Optimisation and Continual Improvement: The Way Forward

The Plant Optimisation Improvement Plan first informs which unit opportunity receives engineering time next month. Process engineers use it to schedule studies, operators use its envelopes on shift and managers use its savings register. After the first actions are implemented, revisit the benchmark: closing one gap often reveals a new constraint further downstream.