JUPITER PRIME

Consulting • Training • Advisory

جوبيتر برايم للاستشارات والتدريب

COURSE BROCHURE

Advanced Production and Operation Techniques Training Course

jupiterprime.uk

info@jupiterprime.uk

Registered in the United Kingdom and Saudi Arabia

Advanced Production and Operation Techniques Training Course

Advanced Production and Operation Techniques is a 2-week training course for production managers, plant superintendents and operations engineers who redesign how a line flows, changes over and keeps its schedule, and who leave with an Operations Improvement Roadmap for their own plant. Shorter product lives, volatile order books and rising energy costs now reward plants that convert capacity into reliable output. Jupiter Prime Training delivers this course for leaders who own that conversion.

Why Production and Operation Techniques Matter Now

Three forces shape production and operation techniques today: customers who expect smaller, more varied orders at short notice; a skilled workforce that is harder to recruit and retain; and connected equipment that exposes every minute of lost time. A plant that masters flow, changeover and scheduling absorbs variety without adding shifts, while one that does not hides losses in inventory and overtime. The course rests on the Toyota Production System TPS, Overall Equipment Effectiveness OEE, Single-Minute Exchange of Die SMED, Theory of Constraints TOC and Total Productive Maintenance TPM.

Who Gains Most from Production and Operation Techniques

- Leaders accountable for line output, cost per unit and delivery adherence across shifts
- Engineers who design cell layouts, station work content and material presentation
- Planners who sequence orders against finite machine and labour capacity
- Maintenance leads who protect equipment availability and changeover speed
- Improvement specialists who run kaizen events and track loss reduction

A plant leadership group that sends its production, planning and maintenance leads together gains most, because flow, schedule and uptime decisions are then redesigned on one shared picture of the line.

Production and Operation Techniques Capabilities

Participants move from measuring line losses to redesigning stations, sequences and changeovers that remove them, and they practise defending each change to the people who run the shift.

- Calculate takt time and balance station work content to it — line staffing decisions
- Analyse OEE losses by availability, performance and quality — capital and maintenance priorities
- Design a SMED changeover sequence separating internal and external tasks — batch size and variety decisions
- Build a finite capacity schedule around the system constraint — delivery promises to customers
- Specify pull signals and supermarket sizes for a value stream — inventory and working capital targets
- Communicate a phased improvement case to plant leadership — investment and resourcing approval

Key Production and Operation Techniques Terms

- Takt time — the available production time divided by customer demand, setting the pace each station must meet.
- Overall Equipment Effectiveness OEE — availability multiplied by performance and quality rate, showing how much planned time becomes good output.
- SMED — a method that converts changeover tasks to be done while the machine runs, shortening the stop between products.
- Line balancing — distributing work elements across stations so each carries a similar load close to takt time.
- Finite capacity scheduling — sequencing orders against the real limits of machines, labour and tooling rather than assumed infinite capacity.
- Drum-buffer-rope — a TOC scheduling approach that paces release of work to the constraint and protects it with a time buffer.

Production and Operation Techniques Day by Day

Day 1: Forces Reshaping the Production Floor

- High-Mix Low-Volume Demand Patterns — Product Range and Plant Configuration
- Toyota Production System House — Choosing Which Principles to Adopt First
- Seven Wastes Walk — Locating Hidden Losses on the Shop Floor
- Workforce Skills Matrix — Cross-Training and Shift Flexibility Choices
- Connected Equipment Data Streams — What to Measure on Each Asset

Day 2: Mapping the Value Stream

- Current-State Value Stream Map — Lead Time and Inventory Exposure
- Process Box Data Collection — Cycle Time and Uptime Baselines
- Information Flow Mapping — Order Release and Scheduling Points
- Lead Time Ladder — Value-Added Ratio and Customer Response
- Future-State Value Stream Map — Target Condition for the Line

Day 3: Takt Time and Line Balancing

- Takt Time Calculation — Matching Line Pace to Customer Demand
- Work Element Breakdown — Separating Value-Added and Incidental Motions
- Yamazumi Chart — Visualising Station Load Against Takt
- Ranked Positional Weight Method — Assigning Elements to Stations
- Operator Headcount Model — Staffing Levels Across Demand Scenarios

Day 4: Cell Design and Material Presentation

- U-Shaped Cell Layout — Operator Walk Paths and Multi-Machine Handling
- Standard Work Combination Sheet — Manual and Machine Time Alignment
- Point-of-Use Material Racks — Reach Distance and Replenishment Frequency
- Water Spider Route Design — Internal Logistics Cycle and Loading
- Ergonomic Station Assessment — Injury Risk and Sustainable Pace

Day 5: Overall Equipment Effectiveness

- OEE Calculation Structure — Availability, Performance and Quality Rate
- Six Big Losses Classification — Prioritising Recovery of Planned Time
- Short-Stop Logging — Minor Stoppages and Speed Loss Patterns
- Pareto of Downtime Causes — Selecting the First Loss to Attack
- OEE Dashboard Design — Shift Review and Escalation Triggers

Day 6: Changeover Reduction with SMED

- Changeover Video Analysis — Internal and External Task Separation
- Quick-Release Clamping and Fixtures — Converting Internal Tasks to External
- Parallel Changeover Teams — Labour Deployment During Product Switches
- Changeover Standard Sheet — Repeatable First-Off Quality
- Economic Batch Size Recalculation — Variety Versus Setup Frequency

Day 7: Equipment Reliability and TPM

- Autonomous Maintenance Steps — Operator Ownership of Basic Care
- Planned Maintenance Calendar — Protecting the Constraint Asset
- Mean Time Between Failures Tracking — Reliability Trend Decisions
- Focused Improvement Kaizen — Chronic Loss Elimination on One Asset
- Spare Parts Criticality Ranking — Stockholding for Critical Equipment

Day 8: Finite Capacity Scheduling and Flow Control

- Constraint Identification — Where Throughput Is Actually Set
- Drum-Buffer-Rope Scheduling — Work Release Paced to the Constraint
- Heijunka Levelling Box — Smoothing Mix and Volume Across the Week
- Kanban Loop Sizing — Supermarket Quantities and Signal Rules
- Finite Capacity Scheduling Software Logic — Sequence-Dependent Setup Handling

Day 9: Leading Improvement on the Floor

- Tiered Daily Huddles — Escalating Line Problems Within the Shift
- A3 Problem-Solving Report — Structuring Countermeasures for Recurring Losses
- Leader Standard Work — Gemba Routines for Supervisors and Managers
- Improvement Business Case — Throughput, Inventory and Operating Expense Effects
- Change Readiness Assessment — Union, Shift and Skill Considerations

Day 10: Practising the Operations Improvement Roadmap

- Line Redesign Simulation — Applying Takt, Balancing and Cell Layout
- Loss Recovery Plan — Applying OEE and SMED Findings
- Schedule Stress Test — Applying Constraint and Levelling Methods
- Peer Challenge Panel — Testing Assumptions Before Leadership Review
- Operations Improvement Roadmap — Phased Actions, Owners and Measures

Applying Production and Operation Techniques After the Course

- Lead a takt time and Yamazumi review on one line and rebalance the two most overloaded stations.
- Run a filmed SMED event on the longest changeover and publish the new changeover standard sheet.

Production and Operation Techniques Questions FAQ

What are advanced production and operation techniques and why do they matter now?

They are the methods that set line pace, remove equipment losses, shorten changeovers and schedule against real capacity. They matter now because plants face more product variety, tighter labour markets and closer scrutiny of every lost minute, in sectors from food processing to automotive components.

Which roles gain most from production and operation techniques training?

Production managers, plant superintendents and operations engineers gain most. Planners, maintenance leads and improvement specialists also benefit, especially when they attend with the production leaders whose lines they schedule and maintain.

How does this production and operation techniques course differ from a production planning course?

It works on the physical line itself rather than on planning systems alone. A planning course concentrates on forecasts, material requirements and master schedules, while this course redesigns stations, changeovers, equipment care and flow control on the floor.

What do you bring back from production and operation techniques training?

You bring back a phased roadmap for your own plant. It sets out line balancing changes, OEE and changeover targets, scheduling rules and owners, ready for review by plant leadership and the shift teams who will run it.

Production and Operation Techniques: The Way Forward

The Operations Improvement Roadmap first informs which line or asset receives improvement effort in the coming quarter. Plant managers use it to assign owners and resources, while supervisors use its measures in daily huddles. After the first changes go live, revisit the constraint: once one loss is removed, throughput is set somewhere else, and the roadmap should follow it.