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COURSE BROCHURE

Data Science for Operational Excellence Training Course

15 – 19 August 2027
Cairo

Data Science for Operational Excellence Training Course

Ref: 2649_100831 **Date:** 15 – 19 August 2027 **Location:** Cairo **Fees:** 4000 GBP

Data Science for Operational Excellence is a 1-week training course for operations, quality and continuous improvement professionals who turn process records into measurable gains, building an Operations Analytics Improvement Case. Process records now grow faster than shift teams can read them, so organisations that model them fix recurring losses sooner. Jupiter Prime Training delivers Data Science for Operational Excellence.

Why Data Science for Operational Excellence Matters Now

Three forces shape this field. Connected equipment produces continuous streams of temperature, vibration and cycle-time readings; customers expect fewer defects and shorter lead times; and improvement teams are asked to prove savings with evidence rather than anecdote. An organisation that reads its process signals early prevents breakdowns, reduces scrap and frees capacity without new capital. The course rests on a six-phase analytics cycle of problem framing, data understanding, preparation, modelling, evaluation and deployment, paired with statistical process control and structured root cause reasoning.

Who Gains Most from Data Science for Operational Excellence

- Production and shift supervision — accountable for throughput and first-pass yield
- Quality assurance and inspection — responsible for control limits and corrective actions
- Continuous improvement and process excellence — owning improvement projects and their verified savings
- Maintenance and reliability planning — scheduling interventions from failure history
- Service operations coordination — managing queues and turnaround times

Cross-functional improvement cells gain most when production, quality and maintenance members attend together.

Data Science for Operational Excellence Capabilities

Participants turn process records into predictions a shift team can act on.

- Assess the quality of machine, inspection and ticket records — the go or no-go call on a dataset
- Apply control charts to separate common from special causes — quality engineers deciding when to intervene
- Build a simple downtime or defect prediction model — reliability planners setting maintenance windows
- Calculate feature importance to rank likely root causes — improvement leads choosing countermeasures
- Weigh model errors against the cost of false alarms and missed failures — operations managers approving alert thresholds
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Communicate findings as an evidence-backed improvement case — sponsors releasing resources for the change

Key Data Science for Operational Excellence Terms

- Process capability index — a ratio comparing the spread of a process with its specification limits.
- Special cause variation — an unusual shift in output traced to an assignable event rather than routine noise.
- Feature engineering — creating model inputs from raw readings such as rolling vibration averages.
- Remaining useful life — an estimate of how long equipment can run before it is expected to fail.
- Precision and recall — paired measures of how many alerts were real and how many real events were caught.
- Data drift — a change over time in the pattern of incoming process data that weakens a model.

Data Science for Operational Excellence Day by Day

Day 1: Operations Problems as Analytics Questions

- Loss Tree of Downtime, Scrap and Delay — Choosing the Loss to Attack
- Six-Phase Analytics Cycle — Sequencing an Operations Analytics Project
- Problem Statement and Target Variable — Defining What the Model Predicts
- Process Map Linked to Data Sources — Locating Where Evidence Is Captured
- Value Hypothesis for Throughput and Yield — Sizing the Benefit Before Modelling

Day 2: Preparing Process and Equipment Records

- Sensor and Log Data Profiling — Judging Whether Records Are Fit for Use
- Time Alignment of Shifts, Batches and Events — Joining Sources Without Distortion
- Missing Readings and Outlier Treatment — Protecting Models From Faulty Instruments
- Rolling Windows and Lag Features — Capturing Equipment Behaviour Before Failure
- Labelling Failure and Defect Events — Building a Trustworthy Training Set

Day 3: Statistical Insight Into Process Behaviour

- Control Charts for Variables and Attributes — Separating Routine Noise From Signals
- Capability Indices and Specification Limits — Testing Whether Output Meets Tolerance
- Hypothesis Tests Across Lines and Shifts — Confirming Real Performance Differences
- Regression on Process Settings — Linking Parameters to Quality Outcomes
- Pareto and Stratification Analysis — Focusing Effort on Dominant Defect Types

Day 4: Predictive Models for Downtime and Quality

- Classification Models for Failure Risk — Flagging Assets Needing Early Attention
- Remaining Useful Life Estimation — Timing Maintenance Windows Against Production Plans
- Anomaly Detection on Sensor Streams — Raising Alerts Before Quality Slips
- Precision, Recall and Alert Cost Trade-Offs — Setting Thresholds Operators Will Trust
- Drift Monitoring and Retraining Triggers — Keeping Models Valid as Processes Change

Day 5: Practising the Operations Analytics Improvement Case

- Feature Importance for Root Cause Ranking — Prioritising Countermeasures From Model Evidence
- Before and After Comparison Design — Verifying Savings From an Improvement
- Shop Floor Alert Routines and Visual Boards — Embedding Predictions in Daily Huddles
- Service Queue Case on Turnaround Breaches — Transferring Methods Beyond Manufacturing
- Operations Analytics Improvement Case — Presenting Evidence, Countermeasure and Expected Gain

Applying Data Science for Operational Excellence After the Course

- Lead a control chart and Pareto review of one line or queue and agree two countermeasures.
- Pilot a failure risk model on one asset group and tune its alert threshold from precision and recall.

Data Science for Operational Excellence Questions FAQ

What is Data Science for Operational Excellence and why does it matter now?

It is the use of statistical and predictive methods on process data to cut downtime, defects and delay. It matters now because connected equipment produces more evidence than manual reviews handle.

Which roles gain most from Data Science for Operational Excellence?

Those who own a process metric gain most: production supervision, quality, reliability planning, improvement and service operations. You benefit if you want to anticipate failures.

How does Data Science for Operational Excellence differ from a general data analysis course?

It focuses on process records and equipment behaviour rather than business reporting. General analysis courses centre on dashboards, whereas this one builds control charts, failure predictions and root cause rankings.

What do you bring back from Data Science for Operational Excellence?

You bring back an evidence-backed improvement case for one real loss in your operation, with a prepared dataset, a tested model and a proposed countermeasure.

Data Science for Operational Excellence: The Way Forward

The Operations Analytics Improvement Case gives an improvement cell a single, testable account of one recurring loss. Its first use informs which countermeasure receives resources, and sponsors, planners and shift leaders all read it. After the first cycle, revisit the alert threshold, since the countermeasure itself changes the data the model relies on.