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COURSE BROCHURE

# Advanced Data Analysis Methods and Techniques Training Course

19 – 30 September 2027
Doha

# Advanced Data Analysis Methods and Techniques Training Course

**Ref:** 203_6202 **Date:** 19 – 30 September 2027 **Location:** Doha **Fees:** 11700 GBP

Advanced Data Analysis Methods and Techniques is a 2-week training course for senior analysts, performance managers and decision-support specialists who build an analytical method selection playbook that matches each business question to a defensible technique. Choosing the wrong model now quietly distorts budgets, forecasts and targets across organisations. The course is delivered by Jupiter Prime Training.

## Why Data Analysis Methods and Techniques Matter Now

Three forces shape the field today. Executives expect forecasts and segment insights within days rather than quarters; cloud platforms put regression, clustering and simulation within reach of every analyst, whether or not the method suits the question; and auditors, boards and regulators increasingly ask how a figure was derived. An organisation that selects and validates its methods well earns trust in its numbers, while one that reaches for familiar averages misreads seasonality, causation and risk. The course follows the Cross-Industry Standard Process for Data Mining CRISP-DM, from business understanding through modelling and evaluation to deployment.

## Who Gains Most from Data Analysis Methods and Techniques

- Analysts accountable for the statistical models behind budgets, forecasts and performance reports
- Performance specialists who interpret variance, trends and drivers for operational leaders
- Decision-support leads who translate business questions into analytical briefs
- Research and insight professionals who design surveys, tests and controlled comparisons
- Planning specialists who own demand, capacity or revenue projections

A central analytics or strategy unit gains most when several members attend together and agree one shared standard for choosing, testing and explaining methods.

## Data Analysis Methods and Techniques Capabilities

Participants move from running familiar tests to defending why a particular estimator, model or design answers the question in front of them.

- Assess whether a business question calls for description, inference, prediction or segmentation — the analytics lead scoping the request
- Design hypothesis tests and controlled experiments with adequate power — product and marketing owners judging an intervention
- Build multivariate regression models and diagnose their assumptions — finance partners explaining cost and revenue drivers
- Apply time-series decomposition and forecasting models to seasonal series — operations planners setting capacity
- Weigh cluster and factor solutions for stability and meaning — commercial heads defining customer segments
- Communicate model limits, uncertainty and validation results — executives deciding how far to rely on a figure

## Key Data Analysis Methods and Techniques Terms

- Multicollinearity — strong correlation among predictor variables that inflates coefficient uncertainty and makes individual effects hard to interpret.
- Statistical power — the probability that a test detects a real effect of a given size, set by sample size, variance and significance level.
- Stationarity — the property of a time series whose mean, variance and autocorrelation stay stable over time, required by many forecasting models.
- Factor loading — the correlation between an observed variable and an underlying factor, showing how strongly the variable expresses that factor.
- Silhouette score — a measure of how well each observation fits its own cluster compared with the nearest neighbouring cluster.
- Cross-validation — repeatedly fitting a model on part of the records and testing it on the remainder to estimate out-of-sample accuracy.

## Data Analysis Methods and Techniques Day by Day

## Day 1: Framing Questions for Analytical Methods

- CRISP-DM Business Understanding — Turning Executive Requests Into Testable Questions
- Question Typology Matrix — Separating Descriptive, Inferential and Predictive Needs
- Variable Measurement Scales — Choosing Valid Summaries and Tests
- Stakeholder Decision Mapping — Linking Each Output to a Named Choice
- Analytical Brief Template — Agreeing Scope, Assumptions and Acceptance Criteria

## Day 2: Preparing Records for Robust Analysis

- Missing-Value Mechanisms and Imputation — Protecting Estimates From Hidden Bias
- Outlier Detection With Robust Statistics — Deciding What to Keep or Exclude
- Variable Transformation and Scaling — Meeting Model Assumptions Before Fitting
- Exploratory Profiling and Distribution Checks — Spotting Skew and Data Quirks
- Reproducible Preparation Scripts — Keeping Every Cleaning Step Auditable

## Day 3: Inference and Hypothesis Testing

- Sampling Distributions and Confidence Intervals — Expressing Uncertainty Around Estimates
- Parametric Versus Non-Parametric Tests — Matching Tests to Distribution Shape
- Multiple-Comparison Corrections — Controlling False Discoveries Across Many Tests
- Effect Size Reporting — Distinguishing Statistical From Practical Significance
- Analysis of Variance — Comparing Performance Across Branches or Product Lines

## Day 4: Experimental Design for Business Decisions

- Randomised Controlled Trials — Isolating the Effect of a Pricing or Process Change
- Power and Sample Size Calculation — Sizing Tests Before Launch
- A/B and Multivariate Test Design — Comparing Website, Branch or Campaign Variants
- Quasi-Experimental Methods — Estimating Impact When Randomisation Is Impossible
- Difference-in-Differences Estimation — Measuring Policy Effects Against a Comparison Group

## Day 5: Multivariate Regression Modelling

- Ordinary Least Squares Specification — Explaining Cost and Revenue Drivers
- Residual Diagnostics and Heteroscedasticity — Testing Whether Model Assumptions Hold
- Multicollinearity and Variance Inflation — Stabilising Coefficients for Interpretation
- Interaction and Polynomial Terms — Capturing Effects That Depend on Context
- Regularised Regression With Ridge and Lasso — Selecting Predictors Among Many Candidates

## Day 6: Classification and Limited Outcomes

- Logistic Regression — Predicting Churn, Default or Claim Likelihood
- Confusion Matrix and ROC Curve — Setting Thresholds Against Business Costs
- Decision Trees and Random Forests — Revealing Non-Linear Drivers of Outcomes
- Count and Survival Models — Analysing Incidents and Time to Event
- Model Calibration Checks — Aligning Predicted Probabilities With Observed Rates

## Day 7: Time-Series Forecasting Techniques

- Seasonal Decomposition — Separating Trend, Seasonality and Irregular Movement
- Stationarity Tests and Differencing — Preparing Series for ARIMA Models
- Exponential Smoothing Families — Forecasting Demand With Level and Season
- ARIMA and Regression With External Drivers — Adding Promotions and Holidays
- Forecast Accuracy Metrics — Comparing MAPE, MASE and Bias Across Horizons

## Day 8: Segmentation With Cluster and Factor Analysis

- Exploratory Factor Analysis — Reducing Survey Items to Underlying Constructs
- Principal Component Analysis — Compressing Correlated Indicators for Reporting
- K-Means and Hierarchical Clustering — Grouping Customers, Patients or Assets
- Cluster Validation With Silhouette and Stability — Judging Segment Robustness
- Segment Profiling Narratives — Turning Clusters Into Actionable Personas

## Day 9: Validation and Communication of Results

- Cross-Validation and Holdout Testing — Estimating Out-of-Sample Performance
- Sensitivity and Scenario Analysis — Showing How Conclusions Shift With Assumptions
- Uncertainty Visualisation — Presenting Intervals and Fan Charts to Executives
- Model Documentation Cards — Recording Purpose, Inputs and Known Limits
- Peer Review Checklists — Challenging Method Choice Before Publication

## Day 10: Practising the Analytical Method Selection Playbook

- Retail Demand Case — Applying Decomposition and Smoothing to a Seasonal Series
- Healthcare Readmission Case — Applying Logistic Models and Calibration to Risk
- Bank Customer Case — Applying Factor and Cluster Methods to Segmentation
- Method Choice Defence Panel — Testing Selections Against Peer Challenge
- Analytical Method Selection Playbook — Completing the Question-to-Technique Guide

## Applying Data Analysis Methods and Techniques After the Course

- Lead a power-calculated A/B test on one live pricing, process or campaign change and report the effect size with its confidence interval.
- Rebuild one recurring forecast using seasonal decomposition and exponential smoothing, then compare MAPE and bias with the current approach.

## Data Analysis Methods and Techniques Questions FAQ

### What are advanced data analysis methods and techniques, and why do they matter now?

They are the statistical and machine learning approaches, such as multivariate regression, forecasting, clustering and experimental design, used to answer business questions defensibly. They matter now because decisions increasingly rest on model outputs that boards and auditors expect analysts to justify.

### Which roles gain most from data analysis methods and techniques training?

Senior analysts, performance and planning specialists and decision-support leads gain most. You benefit if you already run analyses and now need to choose between competing techniques, validate them and explain their limits to executives in finance, operations, healthcare or retail settings.

## How does a data analysis methods and techniques course differ from a dashboard or reporting course?

It focuses on statistical reasoning rather than visual tools. A reporting course teaches how to display figures, while this subject teaches how to estimate, test, forecast and segment them, and how to prove the chosen method suits the question before anything reaches a dashboard.

## What do you bring back from data analysis methods and techniques training?

You bring back a structured guide that links typical business questions to suitable techniques, diagnostics and validation steps. It also holds worked retail, healthcare and banking cases that colleagues can reuse.

## Data Analysis Methods and Techniques: The Way Forward

The analytical method selection playbook first informs how the next forecasting or segmentation request is scoped, ensuring the method is chosen before the software is opened. Analysts, planners and their reviewers use it to agree diagnostics and acceptance criteria early. After its first use, revisit the validation thresholds, because real error rates often reveal which assumptions deserve a stricter test.