CONCEPT

Predictive Analytics and Forecasting: Time Series, Regression and Forecast Accuracy

25 – 29 January 2027
London - Central London four-star



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Introduction

Effective resource allocation, budgeting, and capacity planning require disciplined predictive analytics and forecasting rather than arbitrary percentage uplifts applied to prior figures. When organizations project future demand without testing statistical assumptions, systematic errors compound across operating cycles and surface only after financial periods close. Establishing dependable projections demands formal time series decomposition, structured regression analysis, and rigorous model validation against naive benchmarks. Working across spreadsheet environments and computational toolkits in Excel and Python, participants develop tested models that quantify uncertainty and produce an enterprise Validated Forecasting Model and Forecast Pack with Core Concept.

Course Objectives

- Establish forecast horizon, periodicity, and data granularity while systematically cleansing historical records of calendar distortions and outliers.
- Construct and contrast benchmark, exponential smoothing, ARIMA, and multivariate regression models tailored to underlying data structures.
- Implement rolling-origin backtesting and holdout validation protocols to measure out-of-sample accuracy across competing statistical formulations.
- Evaluate forecast uncertainty using prediction intervals, probabilistic metrics, and scenario sensitivity grounded in ISO 31000 risk principles.
- Isolate the analytical contribution of manual interventions and consensus overrides through systematic Forecast Value Added audits.
- Assemble an operational Forecast Pack detailing model parameters, error ranges, and baseline assumptions for executive review.

Target Audience

- Demand and supply planners establishing baseline operational requirements and throughput projections.
- Financial planning and analysis specialists generating revenue projections, cost drivers, and cash forecasts.
- Business intelligence and data analysts developing predictive algorithms for operational risk, attrition, and volume demands.
- Workforce management and capacity leads projecting staffing schedules, inquiry loads, and service volumes.
- Public sector performance and statistics officers responsible for workload modeling and program projections.
- Commercial planning and sales operations analysts maintaining revenue pipelines and delivery trajectories.

Course Outline

Day 1: Predictive Analytics Foundations and Forecasting Context

- Descriptive, Predictive and Prescriptive Analytics Maturity Model
- Forecast Purpose, Horizon and Granularity Definition Canvas
- Time Series Decomposition: Trend, Seasonality, Cycle and Noise
- Forecast Data Preparation: Calendars, Outliers and Missing Periods
- Current Forecasting Process Assessment with a Naive Forecast Baseline

Day 2: Forecasting Methods and Predictive Modelling Frameworks

- CRISP-DM Lifecycle for Predictive Modelling Projects
- Benchmark Methods: Naive, Seasonal Naive and Moving Average
- Exponential Smoothing Family: Simple, Holt and Holt-Winters ETS
- Box-Jenkins ARIMA and SARIMA Model Identification
- Multiple Regression and Driver-Based Forecasting Models

Day 3: Building and Evaluating Predictive Models

- Excel Forecast Sheet and FORECAST.ETS Model Build
- Python statsmodels and Prophet Model Build
- Churn, Default and Attrition Prediction with scikit-learn Classifiers
- Accuracy Metrics: MAE, RMSE, MAPE, MASE and Forecast Bias
- Rolling-Origin Backtesting and Holdout Validation

Day 4: Uncertainty, Risk and Advanced Problem Cases

- Prediction Intervals and Probabilistic Forecasts
- Scenario and Sensitivity Analysis Aligned to ISO 31000 Principles
- Structural Break, Promotion and Shock Adjustment Techniques
- Intermittent Demand Forecasting with Croston's Method
- Gradient Boosting and Hierarchical Reconciliation Lessons from the M5 Competition

Day 5: Modelling Build and the Forecast Pack

- Retail Demand Case: Model Selection and Backtest
- Public Service Workload Case: Scenario Forecast Build
- Judgemental Adjustment Log and Forecast Value Added Review
- Validated Forecasting Model and Forecast Pack Build
- Forecast Presentation and Peer Challenge Panel

Skills You Will Gain

- Time Series Analysis
- Demand Forecasting
- Predictive Modelling
- Forecast Accuracy Measurement
- Model Backtesting
- Uncertainty Quantification
- Scenario Analysis
- Forecast Communication

Why Attend This Course

- Develop a fully documented Validated Forecasting Model and Forecast Pack ready for implementation within internal planning cycles.
- Replace single-point projections with probability distributions and prediction intervals that communicate realistic operating risks.
- Audit organizational forecasting steps to identify which manual revisions enhance accuracy and which introduce systematic bias.
- Calibrate statistical and machine learning methodologies across diverse public sector, commercial, and operational planning datasets.

Conclusion

Predictive models generate practical value only when planners quantify error, expose underlying assumptions, and articulate risk boundaries. By mastering classical time series decomposition, algorithmic machine learning models, and structured backtesting protocols, analysts transition from passive reporting to active decision support. Participants conclude the course with an enterprise-ready Validated Forecasting Model and Forecast Pack, providing stakeholders with transparent, defensible projections that strengthen organizational resilience.