Business Intelligence & Data · BI22

# Advanced-Data Analysis Techniques

Barcelona (Spain) · 30 Nov 2026 - 4 Dec 2026

| Date | Venue | Duration |
|---|---|---|
| **30 Nov 2026 - 4 Dec 2026** | **Barcelona (Spain)** | **1 Week** |
| Fee | Ref | Language |
| **£5,000 GBP** | **BI22** | **English** |

## Introduction

The Statistical Analysis of Numerical Information is demonstrated to be a powerful tool for providing everyday insight into topics such as corporate finance, manufacturing processes, and quality control.

However, with the rise of the Internet of Things, significant growth in Big Data, and ever-increasing demands to model and predict, many of the analytical possibilities and needs of a modern, high-performing company cannot be met using traditional statistical methods alone.

More and more businesses are dealing with complex modelling and simulation challenges, such as analysing to optimise production systems, maximising fulfilment performance, reducing operating costs, resisting risk, detecting fraud, and forecasting future performance and outcomes.

### Prerequisite

This Advanced Data Analysis Techniques Analytics training course is intended for participants who have previously attended the course (this is a fundamental prerequisite for this training) and thus have a solid understanding of traditional data analysis techniques.

This Analytics training course demonstrates how to build on the method learned in the Data Analysis Techniques training seminar to create a variety of powerful modelling, simulation, and predictive analytical methods by using examples.

Bayesian models, Newtonian and genetic optimisation approaches, Monte Carlo simulation, Markov models, advanced what If review, Time Series models, Linear Programming, and other methods are covered.

This Analytics training course on Advanced Data Analysis Techniques utilises advanced features of Microsoft Excel throughout, and all participants must be fully competent in both Excel and the statistical analysis of data.

## Course Objectives of Advanced Data Analysis Techniques

This Analytics training course on purposes to give those required in explaining numerical data with the knowledge and practical capabilities required to convert data into meaningful information via the usage of a range of very powerful modelling, simulation, and predictive analytical techniques.

**The specific objectives are as follows:**

- To instruct delegates how to explain a wide range of business difficulties which demand modelling, simulation, and predictive analytical approaches
- To explain delegates how to perform a wide range of the more common modelling, simulation and predictive analytical methods using Microsoft Excel 2010 (or higher) and in particular the Solver tool
- To provide delegates with both a conceptual understanding and practical experience of a range of the more common modelling, simulation and predictive analytical techniques, including Bayesian models, conventional and genetic optimisation methods, Monte Carlo models, Markov models, What If analysis, Time Series models, Linear Programming, and more
- To give delegates the ability to recognise which modelling, simulation, and imminent analysis arrangements are best satisfied to which sorts of problems
- To give participants adequate background and professional experience to be capable to judge when a utilised technique will likely lead to incorrect conclusions
- To implement a clear knowledge of why the best companies in the world see modelling, simulation, and predictive analytics as being imperative to delivering the right quality products and optimised services at the lowest probable costs

## Course Methodology of Advanced Data Analysis Techniques

This Analytics training course on Adopts a problem-based training programme, in which participants are performed with a group of real problems described from the widest possible range of applications – they vary from insurance to supply chain logistics, from chemistry to engineering, and from production optimisation to financial risk assessment. Each problem presents and exemplifies the need for a different modelling or analytical method.

This training course is entirely applications-oriented, reducing the time used on the theory and mathematics of analysis and maximising the time wasted on the use of practical methods from within Excel, along with the understanding of how and why such practices work.

participants will consume almost all of their time investigating the use of modelling and simulation techniques using Microsoft Excel, to promote solutions to the true problems that are conferred.

## Organisational Impact of Advanced Data Analysis Techniques

Businesses that can make excellent arrangements, and can certainly predict future trends and behaviours, can enhance considerably their capability to compete on the global stage.

**As a result of sending their employees on this Analytics training course, businesses can expect to profit from:**

- A team from intuition-based to information-based judgment making
- The preparation of accurate solutions to difficult problems
- Enhanced forecasting and future role prediction
- Superior modelling and simulation of business manners
- More intelligent risk estimation and risk-informed decision making

- Enhanced capitalisation on the wealth of information comprised in Big Data

## Personal Impact of Advanced Data Analysis Techniques

Participants will each increase inclusive understanding and many of user experiences of a wide range of the more common modelling, simulation, and sinister analytic techniques.

**All of these will have direct importance to a wide range of business matters, specifically, participants will acquire:**

- New penetrations into the use of optimisation, modelling, and foresight using Microsoft Excel
- Knowledge of Linear Programming
- A judgment of how and when to use Newtonian and Genetic Optimisation Approaches
- Awareness of Scenario Analysis, Markov Modelling, and Monte Carlo Simulation
- The capability to identify which types of analysis are relevant to particular kinds of problems
- Adequate situational awareness to assess when a technique will manage to incorrect results

## Target Audience of Advanced Data Analysis Techniques

This Analytics training course has been outlined for professionals whose jobs require the manipulation, representation, interpretation, and/or analysis of data. This training course requires expanded modelling and analysis using Excel 2010 (or higher) and therefore participants must not only be numerate but must appreciate detailed working with numerical data to resolve complex obstacles.

Full familiarity with Microsoft Excel (version 2007 or higher), and the capability to review data using common statistical programmes, are significant requirements for participation in this training course.

Only participants who have attended the training will be qualified to attend this training course with the goal, without mastery of the abilities taught in the aforementioned training, a Participant will not be capable to succeed on this training course.

## Course Outlines of Advanced Data Analysis Techniques

### DAY 1

### Linear Programming

- Introduction to Optimisation; Multi-variate Optimisation Problems; Determining the Objective Function; Constraints to Problems; Sign Restrictions; The ‘feasibility region’; Graphical Representation; Implementation using Solver in Excel
- Using Linear Programming to Solve Production and Supply Chain / Logistics Problems, such as optimising the products from a refinery, and minimising the manufacturing and delivery costs for a complex supply chain (with and without batch manufacturing, and with and without warehousing)

### DAY 2

### Newtonian and Genetic Optimisation Methods

- Linear and Non-linear Optimisation Problems; Stochastic Search Strategies; Introduction to Genetic Algorithms; Biological Origins; Shortcomings of Newton-type optimisers; How to Apply

Genetic Algorithms; Encoding; Selection; Recombination; Mutation; How to Parallelise; Implementation using Solver in Excel
- How to Solve a range of Optimisation Problems, Culminating in the classic ‘travelling salesman problem’ by optimising the motion trajectory of a large manufacturing robot, both with and without forced constraints

## DAY 3

## Scenario Analysis

- Introduction to Scenario Analysis; A What-If example in Excel; Types of What-If analysis; Performing manual what-if analysis in Excel; One Variable Data Tables; Two-variable data tables
- Using Scenario Manager in Excel; Using scenario analysis to predict business expenses and revenues for an uncertain future

## DAY 4

## Markov Models

- Understanding Risk; Introduction to Markov Models; 5 Steps for Developing Markov Models; Manipulating Arrays and Matrices inside Excel; Constructing the Markov Model; Analysing the Model; Roll Back and Sensitivity Analysis; First-order Monte Carlo; Second-order Monte Carlo
- Decision Trees and Markov Models; Simplifying Tree Structures; Explicitly Accounting for Timing of Events
- Using Markov Chains to simulate an insurance no claims discount scheme and Modelling the Outcomes of a Healthcare System

## DAY 5

## Monte Carlo Simulation

- Introduction to Monte Carlo Simulation; Monte Carlo building blocks in Excel; Using the RAND() function; Learning to model the problem; Building worksheet-based simulations; Simple problems; How many iterations are enough?; Defining complex problems; Modelling the variables; Analysing the data; Freezing the model; Manual recalculation; "Paste Values" function; Basic statistical functions; PERCENTILE function
- Monte Carlo Simulation solutions to problems of traffic flow in a city, dealing with uncertainty in the sale of the product, predicting market growth and assessing risk in currency exchange rates

**Register or ask about this course online**
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