

Statistics Fundamentals for Research & Industry

This basic but wide-ranging course covers the easy to use features in XLSTAT for investigating, visualising and performing basic statistical techniques on data sets typical to research and industry settings. There are many basic concepts that need to be understood before statistics can be used to its full potential to give useful and informative answers. This course ensures that these concepts are understood in a non-technical way and then practised using real data examples.

Mathematical details are kept to a necessary minimum and we focus on the interpretation of the outputs from XLSTAT and illustrate applications with case studies using data from surveys, instrumental analysis, manufacturing processes, clinical trials and biological data.

We aim to explain the objectives of the techniques and to send you away with a better understanding of which technique to use when.

No previous knowledge of statistics is necessary with this course, as we start right from the beginning. It also serves as a useful refresher course to those who once studied statistics as part of a college course.

There is plenty of opportunity for practice using XLSTAT through “hands on exercises” for which annotated solutions are provided.

Day 1

1. Back to the beginning – Refresh the absolute basics of statistics
 - Types of data
 - Summary Measures
 - What is variability?
2. How sure are we? - Assessing Variability
 - Data Visualisation
 - Frequency Distributions
 - Measures of Variability
 - Degrees of Freedom
 - Descriptive Statistics
3. The answer could be...? - Estimation
 - Estimation
 - Confidence Intervals
 - Presenting Results
 - Data Requirements
4. Which is better? - Making Statistical Comparisons
 1. Testing against a target (T Tests)
 2. General Hypothesis tests
 3. Comparison of 2 samples (means and variance) inc ANOVA
 4. Problems with statistical significance and p-values

Day 2

5. Analysis of Binary (Yes/No)Data

- Estimating Response Rates with uncertainty
- Testing for significance

6. Power & Sample Size

- How big a sample do I need to meet my objectives?
- What is statistical power?
- Statistical performance v practical considerations
- Power & Sample Size

7. Correlation & Simple Regression

- Correlation – what it measures
- Simple trend modelling – assessment of fit
- Diagnostics

8. Multiple Regression & Further Modelling

- Variable selection techniques
- Pitfalls for the unwary
- Modelling curvature

9. Study Design

- Issues to consider

The course will be held at a state of the art training venue in the City of London. There are plenty of hotels in the area to suit all budgets and with the course on a Thursday and Friday means there is plenty of chance to also see the sights of London at the weekend!

Computers will be provided so there is no need to bring your laptop (unless you want to work on some of your own data)