Statistics Fundamentals for Research & Industry Using Statistical Software

Duration 2 days
(RND6-0)

Pre-requisite

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.

Course Summary

This basic but wide-ranging course covers the easy to use features in statistical software 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 practiced using real data examples.

Mathematical details are kept to a necessary minimum and we focus on the interpretation of the outputs from statistical software 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.

Software

There is plenty of opportunity for practice using statistical software through “hands on exercises” for which annotated solutions are provided.
We can recommend appropriate software packages.

Flexibility

We can customise the module content to meet specific requirements. This can also be reduced to run as a 1 day course.

Course Content

Day 1 **Back to the beginning – Refresh the absolute basics of statistics**

- Types of data
- Summary Measures
- What is variability?

How sure are we? - Assessing Variability

- Data Visualisation
- Frequency Distributions
- Measures of Variability
- Degrees of Freedom
- Descriptive Statistics

The answer could be…? - Estimation

- Estimation
- Confidence Intervals
- Presenting Results
- Data Requirements

Which is better? - Making Statistical Comparisons

- Testing against a target (T Tests)
- General Hypothesis tests
- Comparison of 2 samples (means and variance) inc ANOVA
- Problems with statistical significance and p-values

Day 2 **Analysis of Binary (Yes/No)Data**

- Estimating Response Rates with uncertainty
- Testing for significance

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

Correlation & Simple Regression

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

Multiple Regression & Further Modelling

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

Study Design

- Issues to consider

For further information and pricing contact:
Qi Statistics Ltd at www.qistatistics.co.uk or telephone +44 (0)1189 345722