Making Data do the Work: Essential and Advanced Statistics for Manufacturing R&D

(Hands on course using MINITAB following six sigma best practice)

Duration 3 days
(MAN4-3)

This series of courses covers the statistical techniques for investigating, performing and interpreting common statistical techniques on data sets typical to manufacturing. 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 to the business and there are also many ways statistics can be taught and learnt! This course aims to break the myth that statistics is 'boring' or 'too tricky' and show you how it actually could save you time and improve your working day!

Pre-requisite

No previous knowledge is required for Day 1 and once Day 1 is completed, participants will be ready to take on either of the other 2 day courses. If day 1 is not attended, a basic awareness of how statistics is used is assumed, together with an understanding of the topics covered on the day 1 course. However there will be plenty of reminders of statistical concepts given along the way throughout both of the 2 day courses.

Course Summary

The course ensures that statistical concepts are understood in a non-technical way and then applied using real data examples and relevant software. The software of choice for the course will be MINITAB.

We aim to explain the objectives of the techniques and to send you away with a better understanding of which technique to use when and how to run these in the MINITAB software package.

Mathematical details are kept to a necessary minimum and where used are thoroughly and non-technically explained. The focus is on the interpretation of the outputs from MINITAB and illustrated with examples using data from a variety of manufacturing scenarios. There is plenty of opportunity for practice using MINITAB through "hands on exercises" for which annotated solutions are provided.

Software

MINITAB

Flexibility

There are several possible options for attending this course, either as day 1 alone (1 day in total), either of the 2 day courses alone (2 days in total), or day 1 plus one of the 2 day options (3 days in total).

More details in the individual aspects of the course are given below, however if you would like more information or to discuss customizing examples with your typical data please contact us.

Course content

Day 1: Fundamental Statistical Concepts and Analysis Methods (optional)

THEN EITHER

Days 2&3 (Option 1): Assessing Quality – Process Control, Capability & Measurement Systems Analysis

OR

Days 2&3 (Option 2): Experimental Design for Process Development and Improvement

Qi statistics

Course description and details

MANUFACTURING

Day 2 &3 (Option 1): Assessing Quality – Process Control, Capability & Measurement Systems Analysis

Training Objectives:

- To understand how to investigate if processes are on track (monitoring), showing a trend or just subject to a lot of random variation
- To introduce attendees how to assess the quality of their processes and outputs using accepted statistical techniques (the course covers all the topics suggested in the statistical section of the six sigma green belt training)
- To use statistical software to both design and analyse efficient and capable processes
- To understand and interpret the graphical and statistical outputs provided by the software

Topics Covered:

- Statistical Process Control
  - Objectives & Aims
  - Control charts
- Statistical Process Capability
  - Measures of capability (Cp, Cpk)
  - Potential vs Actual Capability
  - Design of capability studies
  - Non-normal capability
- Gage R&R

Day 2 &3 (Option 2): Experimental Design for Process Development and Improvement

Training Objectives:

- To introduce attendees to the benefits of statistical experimental design
- To use statistical software to both design and analyse experiments
- To understand and interpret the graphical and statistical outputs
- To enable attendees to develop a programme of experimentation from screening key variables to process optimisation

Topics Covered:

- Statistical modelling refresher
- Factorial experiments - benefits, design issues, interpretation of effects and importance of understanding interactions
- Screening designs - how to deal with many factors, fractional factorials benefits and dangers
- Optimisation experiments - Experimental designs for process optimisation: Box-Behnken, central composite and other options.
- Optimisation, identification of viable operating regions when there are many output parameters
- Mixture designs

For further information and pricing contact:
Qi Statistics Ltd at www.qistatistics.co.uk or telephone +44 (0)1189 34572