SQT

TRAINING THAT DEVELOPS
REAL CAPABILITY









Design of Experiments with Minitab

CPI004

Design of Experiments with Minitab

Many experimenters are using an OFAT (one-factor-at-a-time) approach to their experimental designs. In addition to the issue of inefficiency, this approach fails to identify often crucially important interaction effects among factors. There are available to experimenters advanced analytical tools based on mathematical techniques and utilising special computer software, which will enable them to gain a deep understanding of their processes, including the impact of interactions among factors, and to do so in the most efficient manner with minimum numbers of experimental runs. These modern DOE tools will be presented on this training course.

Duration & Price

Duration: 3 days
Public Virtual Training: €1,055
Delivery mode: This programme is available In-Company, and via Public Virtual Training

Dates & Locations

Date	Venue	
15 - 17 Jun 2027	Virtual	Book Date

In-Company Training

Please contact us for more information on our In-Company training options

What's covered?

Day 1 - Introduction to Statistics Underlying Experimental Design

- Mean, variance, standard deviation, degrees of freedom
- The normal, Student-t and F distributions
- Normal probability plots
- Hypothesis testing

Day 2 - DOE Terminology

- Definition of terms such as independent and dependent variables, factors and levels, response, treatment, error and replication

Planning and Organizing Experiments

- Applying the basic elements of experiment planning and organizing, including determining the experiment objective; selecting factors, responses, and measurement methods; choosing the appropriate design
- Design Principles
- Applying the principles of power and sample size, balance, replication, order, efficiency, randomisation and blocking, interaction, and confounding

Design and Analysis of Factorial Experiments

- Constructing full-factorial designs and applying computational and graphical methods to

analyse and evaluate the significance of results
- Planning the experiment and determining the experimental objective.
- Explanation of the terminology – responses, factors, levels, replication, randomization, design points, design runs
- Understanding the statistical importance of avoiding excess variation in experiments – the role of measurement and careful control of the experiments
- Establishing the basic principles with a two factor and three factor design – explanation of main effects and interactions
- Analysis of experimental results using the two-sample t-test, ANOVA, and the probability plot
- Screening out the non-significant factors
- Understanding how to interpret interaction plots
- The role of blocking in DOE
- The need to reduce the number of runs when there are a large number of factors involved – the concept of using fractional factorial designs

Day 3

- Fractional factorial designs continued
- Simple and multiple regression and correlation analysis
- Analysis of residuals
- Optimization – Response Surface Methodology (RSM)– Modelling the relationship between factors and responses using advanced mathematical techniques and computer software
- Simultaneously optimising multiple responses

Who should participate?

- Product design and process design engineers and scientists
- R&D engineers and scientists
- QC and QA personnel

What will I learn?

Participants achieve the following learning outcomes from the programme;

- Plan designed experiments to include appropriate factors and responses
- Analyse factor effects and interaction effects using specialist computer software
- Interpret the outcome of designed experiments so as to choose factor settings for optimum process performance
- Demonstrate knowledge of the statistics underlying the design of experiments

What are the entry requirements?

A prior knowledge of basic statistics is recommended. However, the course will commence with a review of basic statistics, which will be sufficient to provide understanding of the statistical material that will be met during the course. Participants should have knowledge of mathematical principles, for example, Leaving Certificate mathematics.

How do we train and support you?

In-House Courses

For In-House courses the tutor will contact you in advance to discuss the course programme in more detail in order to tailor it specifically for your organisation. Where appropriate and facilitated by the organisation, the course can be run using Minitab or Design Expert software.

Course Manual

Delegates will receive a very comprehensive course manual written by the course tutor, which explains the underlying statistics, describes the principles of experimental design, explains in detail how experiments are designed and analysed, includes examples of several practical case studies, and incorporates completed versions of all the course exercises and graphs, including the output from Minitab computer software. The course manual will provide a very useful reference for participants undertaking the design and analysis of experiments when they return to their workplace.

What software do we use?

Minitab will be demonstrated as part of the training. Delegates are invited to bring a laptop loaded with either Minitab 20, 21 or 22 and they will work through several Minitab exercises throughout the three days of the course. A free 14 day trial version of Minitab 22 is available on www.minitab.com. For in-company training courses, there is an option to use the specialist DOE software, Design Expert. A free 45 day trial version of Design Expert is available for downloading from www.statease.com.

Tutors



Albert Plant
View Profile



Grainne Heneghan
View Profile

What Our Learners Say

We believe in excellence through transparency and continuous improvement. That's why we invite all our delegates to share their experiences on CourseCheck.com, an independent platform dedicated to genuine, unfiltered feedback. Learner insights help us not only to enhance our training programmes but also empower potential learners to make informed decisions. Click on the link below to read firsthand experiences and testimonials from past learners.

Click Here

SQT TRAINING THAT DEVELOPS *REAL* CAPABILITY

SQT provide a unique combination of high quality, accredited, practical training delivered by leading industry experts and supported by the most up to date learning technology and tools

LEAN SIX SIGMA, PROCESS & PROJECT MANAGEMENT

- Lean Six Sigma
- Join our Lean Six Sigma Network
- Continual Process Improvement
- Project & Programme Management

COMPLIANCE, STANDARDS & AUDITING

- Quality
- Environment & Energy Management
- Health & Safety
- Food Safety
- Life Sciences
- Laboratory
- Integrated Management Systems

LEADERSHIP & PERSONAL DEVELOPMENT

- Leadership & Personal Development
- Train the Trainer

QQI AWARD | IEMA APPROVED | CompEx Part of the JTL Group | FSPCA FOOD SAFETY PREVENTIVE CONTROLS ALLIANCE | CQI IRCA APPROVED TRAINING PARTNER | Chartered Institute of Environmental Health

SQT Training Ltd. | T: +353 61 339040 | E: info@sqt-training.com
W: sqt-training.com

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