

## DESIGN OF EXPERIMENTS (DOE)

### 2 day workshop

#### 1. Design of Experiments (DOE)

DOE is an approach to process analysis that identifies which input factors in a process (e.g. temp, pressure, time, altitude, colour, material type) have most influence on the process outputs, and enables the selection of optimal settings for these inputs in order to optimize process outputs. This interactive workshop introduces DOE to engineers, managers, and technicians. The focus is on the practical application of this essential product and process development tool with a small emphasis on statistics and a big emphasis on how modern DOE software packages (e.g. Minitab) can help.

#### 2. Learning Objectives and Deliverables

Upon completion, participants will understand:

- The principles of DOE
- The need for experimentation and different approaches to experimentation
- How to select relevant factors (process inputs) for DOE
- How to establish orthogonal arrays (structured selection of tests to run, to minimise the amount of testing needed)
- How to design and run an experiment
- How to graph and analyse DOE results
- How to bring about a significant increase in process results, based on scientific understanding of influencing process inputs.

#### 3. Workshop agenda

Time	Day 1	Day 2
9:00	Introductions Problems with experimental strategies Introduction to DOE Designing a simple experiment Running a simple experiment	Centre points and blocking Fractional Factorial Experiments – how to screen many factors with a few runs Follow-up on practical experiment
12:30	Lunch	Lunch
13:30	Analysing an experiment graphically Analysing an experiment statistically Trial experiment & practical session for candidates	Plackett-Burman Experiments Response Surface Methodology Case study review
16:30	Review & close	Review & close

#### 4. Who should attend?

Product or process development engineers, scientists and statisticians in all industries and services including pharmaceutical, medical, automotive, general engineering, semiconductor, plastics and composites. DOE is also particularly useful for the development of new analytical tests and methods. In summary, this approach is useful to anyone charged with optimizing the performance of a process that has many input variables.

#### 5. Contact

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