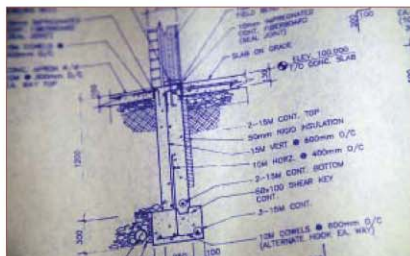




► Design of Experiments

Using DOE methods to improve product and process design



Design of Experiments (DOE) is a complex but powerful method of validating product and process designs. So often, organizational experiments are carried out using “best guess” or “one factor at a time” approaches to determine which particular changes or solutions work best. These methods of testing can be time and resource-intensive, may lead you on a random walk of experimenting, and may or may not produce the optimal solution in the end.

DOE, on the other hand, guides experimenters through making several simultaneous changes or testing more than one factor at a time. Overall, you spend less time and resources doing fewer experiments, and you end up with better, more reproducible solutions.

Course Description

BMGI's Design of Experiments course is designed for engineers, scientists, researchers and developers who are interested in reducing experiment timing and costs and improving results. The five-day course includes an introduction to statistics before delving into the specifics of conducting a variety of proven experimental designs. Participants will learn about the advantages of fractional and screening designs versus full factorial and Taguchi designs. The last day includes an introduction to more advanced design approaches, including response surface designs and mixture designs. Along the way, participants will learn what type of design works best for the particular outcomes they want to investigate as well as gain an understanding of how to analyze DOE results.

Course Highlights

- ❑ Offers a quick and effective way to get up to speed on DOE, without prior or continuing knowledge of Six Sigma.
- ❑ Features extensive practical application, with hands-on exercises and simulations.
- ❑ Designed by the same experienced DOE practitioners who contributed to “The Complete Idiot’s Guide to Lean Six Sigma” (AlphaBooks, 2007), and “The Innovator’s Toolkit: 50+ Techniques for Predictable and Organic Growth” (Wiley, 2008).

Course Specifics

Who Should Attend:

Engineers, researchers and developers, scientists and others who are interested in improving experimental results and have NOT been trained in Six Sigma.

Session Length:

4 or 5 consecutive days

Course Requirements:

A computer with MS Excel and prior knowledge of Excel.

(continued)

“BMGI’s training material is comprehensive and, given the complexity of the subject matter, easy to follow.”

– Joe Guthrie
Deployment Leader
Asure

KEY LEARNING OUTCOMES

Participants will learn how to:

- ❑ Enhance product and process development through improved experimentation.
- ❑ Plan, design and conduct more effective experiments with minimal resources and time.
- ❑ Accurately track experiment results during multiple trials.
- ❑ Reduce development time for new products/processes.
- ❑ Improve process control for higher quality outcomes.

Design of Experiments

Course Agenda

Design of Experiments includes the following topics. The first day is optional, based on student needs.

► Day 1 - Basic Statistics for Engineers (Optional)

- ❑ Data Types, Statistical Measures
- ❑ Cause & Effect Diagrams
- ❑ Capability
- ❑ Statistical Process Control
- ❑ Simple Linear Regression & Correlation

► Day 2 - Introduction to Design of Experiments

- ❑ On-line vs. Off-line Improvement
- ❑ System – Parameter – Tolerance Design
- ❑ Loss Function Analysis
- ❑ Computer Simulations
- ❑ Design of Experiments Concepts
- ❑ 2k Factorial Designs
- ❑ Randomizing and Blocking Methods
- ❑ Main Effects & Interaction Analysis
- ❑ Multiple Response Optimization

► Day 3 - Fractional and Screening Designs

- ❑ 2k Fractional Designs
- ❑ Aliasing and Confounding of Interactions
- ❑ Screening Designs (Plackett - Burman)
- ❑ Classroom Simulations

► Day 4 - Full Factorial and Taguchi Designs

- ❑ Multiple Level Designs
- ❑ Interactions, Covariates, Random Factors
- ❑ Transactional DOE's
- ❑ Taguchi Concepts
- ❑ L18 Design

► Day 5 - Introduction to Advanced Designs

- ❑ Response Surface Designs
- ❑ Mixture Designs

BMGI holds this class regularly in cities around the world.

Classes can also be scheduled onsite for groups of six or more.

Curriculum is available for licensing.



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