

Design of Experiments: New Methods and How to Use Them

October 18 & 19

Douglas Montgomery, Arizona State University
Bradley Jones, SAS Institute, JMP Division

Early designed experiments in agriculture required a statistician to create a design and analyze the data. As DOE has transcended its roots in agriculture, the lack of statisticians relative to the number of potential applications of DOE makes professional statistical involvement in every experimental study infeasible. One way of dealing with this scarcity is to use tabulated sample plans that are available in textbooks on designed experiments. These plans typically have very desirable statistical properties and have a fairly wide range of applicability. This "one size fits all" approach to design choice is quite popular.

Recently, a viable alternative has arisen due to a huge increase in the power of computers and their accompanying software. A computer-aided approach to DOE offers the possibility of a tailored approach to design as opposed to the "one size fits all" approach. As a result interest in design of experiments (DOE) has greatly increased in recent years. Many organizations have effectively integrated the design of experiments methodology into their overall operational improvement strategy, including those deploying six sigma and design for six sigma (DFSS). DOE is the most powerful of the six sigma tools, and its impact on product design and development, manufacturing, and production operations can be profound.

Well-designed experiments are a powerful tool for developing and validating cause and effect relationships when evaluating and improving product and process performance. Designed experiments are the only efficient way to verify the impact of changes in product or process factors on actual performance.

This course on DOE is unique in that it discusses new approaches to choosing a design and analyzing the resulting data that have only been recently available. These methods allow you to solve the most complex experimental design problems easily and directly using the same general approach.

The course is taught by two internationally known experts in the field, one of whom is the author of the most widely-used textbook on the subject. The instructors have over 60 years of experience in teaching and using DOE in a wide variety of industrial and business settings. The course focuses on several major aspects of DOE, including both the practical and the statistical aspects, and interpretation of results.

Course Topics

- * Screening designs
- * Nonregular fractional factorial designs and their advantages
- * Optimal designs
- * Response surface designs
- * Mixture experiments
- * Robust design
- * Split-plot experiment

Notes:

- * There are 48 computers available, provided by SAS for this event.
- * Registration came all at once and exceeded that total of machines by about 10 people.
- * If you do not want to share a machine, you might want to have your own laptop available.
- * JMP can be downloaded for a 30-day trial.
- * JMP notes will be provided.

Book:

- * 15 Copies of Douglas Montgomery's book, Design and Analysis of Experiments, 7th ed will be available for \$125.00.

Slides
JMPfiles1
JMPfiles2

The short course is a free service offered to conference registrants. No additional fees are required beyond conference registration.