stateaser

Workshop Schedule

DOE Simplified

November 7: Minneapolis, MN

An overview of Design of Experiments from A to Z, based on the popular book. $195*

Statistics for Technical Professionals New!

July 23-24: Minneapolis, MN
October 1-2: Minneapolis, MN

Revitalize the statistical skills you need to stay competitive. $895*

Experiment Design Made Easy

July 9-11: Seattle, WA
August 6-8: San Jose, CA
September 10-12: Minneapolis, MN
October 8-10: Philadelphia, PA
November 5-7: Dallas, TX
December 10-12: San Jose, CA

Study the practical aspects of DOE. Learn about simple, but powerful, two-level factorial designs. $1295*

Response Surface Methods for Process Optimization

July 16-18: Minneapolis, MN
October 15-17: Minneapolis, MN

Maximize profitability by discovering optimal process settings. $1295*

Mixture Design for Optimal Formulations

August 13-15: Minneapolis, MN
November 12-14: Minneapolis, MN

Learn high-powered statistical tools that help you find the ideal recipe for your mixture. $1295*

Robust Design: DOE Tools for Reducing Variation

October 8-10: Minneapolis, MN

Use DOE to create products and processes robust to varying conditions. A must for six sigma. *Factorial and RSM proficiency are required.* $1295*

Attendance limited to 20. Reserve your place by calling Sherry at **800.801.7191 x18**.

*Includes a $95.00 student materials charge which is subject to state and local taxes.

Stat-Ease
statistics made easy™

Goldilocks and the 3 Chairs

Goldilocks paid a visit to our new home (suite 480, Hennepin Square - the full address is on page 4) in Minneapolis, MN. She sat down in three different chairs trying to determine which one was "just right" for the students who attend Stat-Ease's DOE workshops.

You see, our current home has a fantastic new training room which needed new furniture! (All Minneapolis classes will now be held in our new facility. The training room may also be rented for private DOE training sessions.) Of the chairs we were choosing between, there was not a great difference in price. Comfort, then, became the deciding factor. We decided to do a DOE to pick the chair which was most comfortable to the most people.

Our students are not all the same size as Goldilocks (otherwise known as Sherry Klick, Workshop Coordinator). She is rather slightly built and has long blond hair to contend with. We thought that differing size people might have different opinions about the comfort of the chairs. So, the Stat-Ease crew joined Goldilocks in testing out three chairs - a

Sherry & Shari's Experiment

blue, black, and maroon one. Each person independently tested each chair by using it for approximately half an hour and then gave it a rating from 1 to 5. A rating system like this works well for responses that are subjective in nature.

Getting the opinions of multiple people ensures that the results should satisfy most students. However, we had to somehow deal with the fact that some people may look at a 1-5 scale and think that nothing deserves a "5" while others may think that nothing deserves a "1". The first thing we did to try to counteract that effect was to define each unit of the rating system (see the rating scale on the left). In a real manufacturing setting, you might try taking pictures of product samples that represent each point on the scale. For instance, you could take a picture of a "worst case" sample and label it a "1". Then take a "mid-point" sample and call it a "3", and so on. This will create consistency in the ratings.
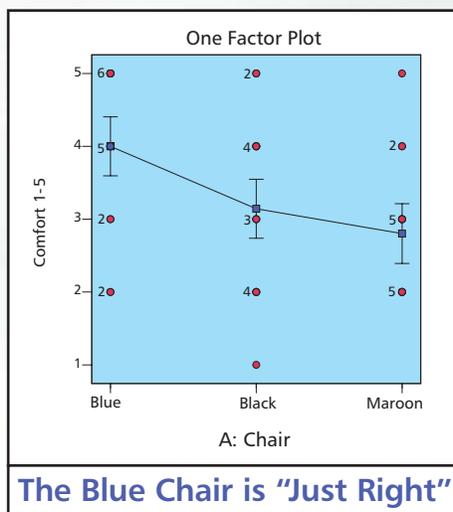
Rating System

1 - Hate it!
2 - Not thrilled with it
3 - A chair's a chair
4 - Like it
5 - Love it!

-- Continued from page 1.

The other thing that can be done from an analysis standpoint is to block on the person doing the rating. In our case, we ended up with 14 people testing the chairs, so we had 14 blocks. Blocking is a statistical technique that removes a potential source of variation from the ANOVA before the effects are tested for significance against the noise. An important note here is that blocking is only done on variables that you are NOT trying to study.

In our case, we suspected that individuals might have differing ways of rating the chairs, but we did not care about these differences. Our interest was only in the differences between the chairs. You should consider blocking on resources that are used to complete an experiment, such as differing material batches, operators, shifts or days.

The test results showed clear favor for the Blue chair. The Blue chair was rated a 4 or 5 eleven times, versus the Black chair six times and the Maroon chair only three times. The data analysis

The Blue Chair is "Just Right"

(not shown) indicated a statistically significant difference between the Blue chair and either the Black or Maroon chairs.

Students who attend DOE workshops at the new Stat-Ease site will now have the luxury of sitting in brand new chairs. You can be confident that the chairs were chosen through DOE testing with your comfort in mind.

- Shari Kraber, shari@statease.com

New Private Workshop Pricing!

Stat-Ease is pleased to announce a new pricing structure for private, in-house DOE workshops. Have you been wanting to host a private training session at your company, but didn't think you had enough students to justify the cost? Our recently revised pricing plan makes workshops much more cost effective for smaller groups of students, as well as large.

What are the benefits of holding a workshop in-house? The instructor does the traveling, not your employees. This reduces your expenses and reduces employee time away from work.

During the workshop, we can discuss applications that are specific to your

work environment and examples that your employees are familiar with. Stat-Ease instructors are not only DOE experts, but are also experienced engineers who are ready to answer your specific questions.

Based on the cost of tuition alone, it is economical to bring Stat-Ease workshops in-house if you have 6 or more employees to train. And, if you have a larger group, you'll save even more.

If you would like a quotation for in-house training, please contact the Workshop Coordinator, Sherry Klick, at **612.378.9449 x18** or **sherry@statease.com**. For an accurate quote, please provide her with an estimated number of students .

Did You Know That...? (Helpful Hints for DX6)

We've designed Design-Expert 6 software to be flexible and user-friendly. For those of you who haven't had a chance to fully explore its capabilities, here are some tips to help you make the most of it:

☑ To bring up Help specific to the screen that you are on, click on the **?** button (located next to the printer button at the top of Design-Expert). F1 generally also accesses context-sensitive help.

☑ You can change factor names or levels by right-clicking on either a factor or response column header and choosing Edit Info. This is a convenient way of editing design information rather than rebuilding the design.

☑ Insert or Delete a response (or factor) by right-clicking on a response or factor column header.

☑ To access context-sensitive help, right-click on a number (not a name) on any report.

☑ To ensure that a graph is sized correctly when you copy/paste it to another document, turn off the legend first (View, Show Graph Legend).

☑ On a graph, you can change axis settings, number formats, graph features, colors, and more, by right-clicking on the graph and choosing Graph Preferences. On a contour plot, you can set the increments of the contour lines to specific values.

☑ Under Numerical Optimization you can choose the Options button and then increase the number of random starting points for the optimization search (i.e. change the default of 10 to perhaps 30.) This has the potential to increase the number of possible solutions found. This is desirable if you have a large number of responses or complex analyses. Moving the red slider bar for the Duplicate solutions filter to the right (+) will decrease the number of solutions that are nearly the same. Similarly, sliding the bar to the left (-) will increase the number of nearly identical solutions.

- Shari Kraber, shari@statease.com

Easily edit factor names or levels with a right click

Alter graph settings by choosing Graph Preferences

Edit your optimization search

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06/02

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	Upgrade to DX6 from DX5 Old Serial # required:	$295.00	
	Upgrade to DX6 from DX4 or earlier Old Serial # required:	$395.00	
	DOE Simplified Book (Comes with a 180-day CD-ROM of Design-Ease 6 software)	$39.95	
	Shipping within the USA—Add $15.00 for each software package & $5.00 for each book. All others, please call for a quote.		
	Total (Residents of Minnesota are subject to state and local taxes.)		

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