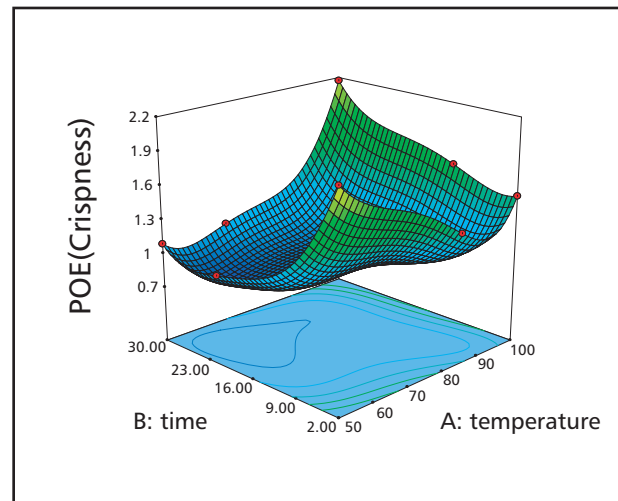


Robust Design & Tolerance Analysis (RDTA)—2 days (In-House Only)

Use DOE to create products and processes robust to varying conditions, then assure your specifications are met via tolerance analysis. This workshop is a must for lean manufacturing. Anyone with prior DOE experience and the desire to create ideal products or processes should attend.

In just two days you discover how to take your DOE knowledge to the next level by making improved design decisions that lead to defect-free products. Apply the techniques you learn to minimize expensive design rework and accelerate product scale-up and commercialization.



You'll Learn How to:

- Apply robust designs in lean manufacturing settings
- Find robust operating conditions
- Discover which DOE is best for verification studies
- Use propagation of error (POE) to optimize factor levels and minimize sensitivity to noise
- Improve the process capability indices (Cpk's) for your process via tolerance analysis
- Use VarTran® software for tolerance analysis

Prerequisites: Advanced DOE proficiency—a working knowledge of factorial design, RSM, and tolerance analysis (green-belt in Six Sigma statistics). Both the *Experiment Design Made Easy* and *Response Surface Methods for Process Optimization* workshops are recommended. **Fee:** Private workshop only. **Fee Includes:** Course materials and a link to a time-limited version of Design-Expert software (1.6 CEU's).

Basic Statistics for DOE (SDOE)—1 day

Refresh yourself on the fundamental statistics that serve as the base for design of experiments (DOE) skills. In a quick one-day class, we will review basic concepts and learn how to use Design-Expert® software to generate statistics such as confidence intervals, t-tests, and one-way ANOVAs. You'll also learn how to calculate mean, variance, and standard deviation, as well as power and sample size.

Basic Statistics for DOE is aimed at engineers and other technical professionals who would like to brush up on their statistical skills before attending a DOE workshop. Using Design-Expert software, practical case studies are interwoven with statistical theory to help you rediscover your long-lost skills. Entertaining videos expand on the concepts presented in class.

Prerequisites: None. **Fee:** \$595 for 1 day (\$495 if you send 3+ students). **Fee Includes:** Course materials and a link to a time-limited version of Design-Expert software. (0.8 CEU's).

PreDOE: Basic Statistics for Experimenters (Web-Based Prerequisite)—3–6 hours

If you have never taken a statistics class, you may need a jump start before doing Design of Experiments (DOE). The *PreDOE* online course provides the essentials you need. Our objective is to keep it simple and make it fun. After mastering simple statistical tools, you'll be ready to move on to the next level—our two-day *Experiment Design Made Easy* workshop.

PreDOE is an entry-level course for technicians, managers, and professionals who need to begin with the basics. It teaches the fundamental statistics used in design of experiments (DOE) through the use of reading materials, interactive exercises, and quizzes. It's fun and informative.

Upon successful completion (which involves passing the final test with a score of 80% or higher) you'll receive a certificate granting you 0.6 CEU's. For more information, please visit our web site: www.statease.com/out_pre.html. Access *PreDOE* web-based training at www.statease.net.

Prerequisites: None. Use our our free Self-Assessment Questionnaire to determine whether or not you should take this course. Visit www.statease.net. **Fee:** Free—a \$95 value (0.6 CEU's).

Design of Experiments (DOE) Workshops

Learn how to optimize your product or process with DOE

Stat-Ease, Inc. offers classes on design of experiments (DOE) for everyone from the first-time experimenter to the advanced practitioner. Whether you are an engineer, scientist, quality professional or statistician, you want to do all you can to improve quality and efficiency, and save money at the same time!

By enrolling in a Stat-Ease® class you benefit from experienced instructors (see www.statease.com for pictures and biographies) who have worked worldwide in industry. You will also receive free follow-up help by phone or e-mail.

You'll work through many practical and specific hands-on case study exercises to learn how to apply your new skills. Students attending these classes are given a path to all simulation and data files used in class, which are posted to a special internet site where you can also link to a free, fully-functional, but time-limited, copy of Design-Expert® software for use after class.

In addition to public workshops in the United States, Stat-Ease offers private in-house classes at your location, both here and abroad. In-house training is cost-effective when you have six or more students. For more information on any of our workshops, contact Elicia at 612.746.2038 or workshops@statease.com, or visit our web site at www.statease.com.

COURSE DESCRIPTIONS

Experiment Design Made Easy (EDME)—2 days

Learn how to make breakthrough improvements using powerful DOE techniques. Our *Experiment Design Made Easy* workshop teaches you how to find the specific factors you need to focus on. Discover previously unknown interactions that often prove to be the key to surpassing the competition. Learn how to use powerful statistical methods that give you confidence in your findings. Test and hone your skills along the way with realistic simulations.

Experiment Design Made Easy covers the practical aspects of DOE. You master simple but very powerful two-level factorial designs.

During this entry-level DOE workshop, discover how to:

- Follow an effective four-step DOE process
- Randomize, replicate, and block out error

"Stat-Ease courses enabled me to bring better products to market faster. They were truly among the best classes I have attended (including graduate-level classes) in terms of improving my abilities to succeed in product development."

Alex Fensore
International Imaging Materials (New York)

- Use statistical power to create the right size design
- Interpret analysis of variance (ANOVA)
- Discover hidden interactions that make or break
- Exploit efficient fractional designs
- Screen variables to find the precious vital few
- Determine when to use transformations
- Explore categoric factors with general factorials.

Prerequisites: Math skills, basic statistics. **Fee:** \$1295 for 2 days (\$1095 if you send 3+ students). **Fee Includes:** Course materials and a link to a time-limited version of Design-Expert software. **Optional:** *DOE Simplified* book by Anderson & Whitcomb (1.6 CEU's).

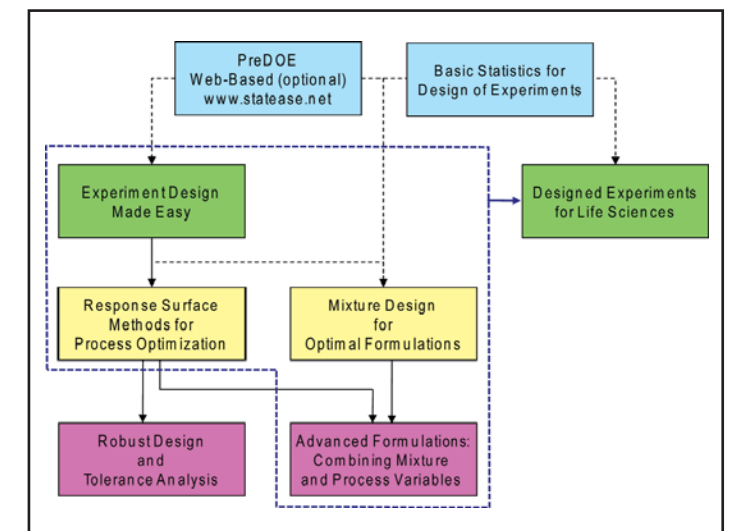
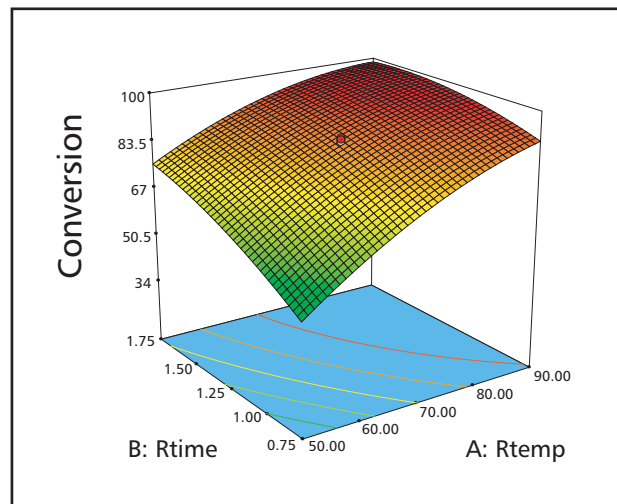


Diagram of the Workshop Prerequisites

Two-Day Core Classes

Response Surface Methods for Process Optimization (RSM)—2 days

Response surface methods (RSM) lead you to the peak of process performance. The *RSM for Process Optimization* workshop teaches you how to produce precise maps based on statistical models. Learn how to put all your data responses together via sophisticated optimization approaches. Find the "sweet spot" where you meet all specifications at minimal cost.



During the *RSM for Process Optimization* workshop you learn how to:

- Augment fractional factorials to estimate more terms
- Set up central composite designs (CCD), Box-Behnken, and other optimal RSM designs
- Select appropriate regression models
- Generate response contours and 3D surfaces
- Optimize multiple responses simultaneously
- Design for constrained processing regions
- Use fraction of design space (FDS) to size designs for prediction precision
- Evaluate design quality

Design-Expert software provides essential computing power for RSM. Many simulations interspersed throughout the workshop realistically test knowledge and skills.

Note: If you work with formulations, our Mixture Design workshop may be more appropriate. Call us if you're unsure.

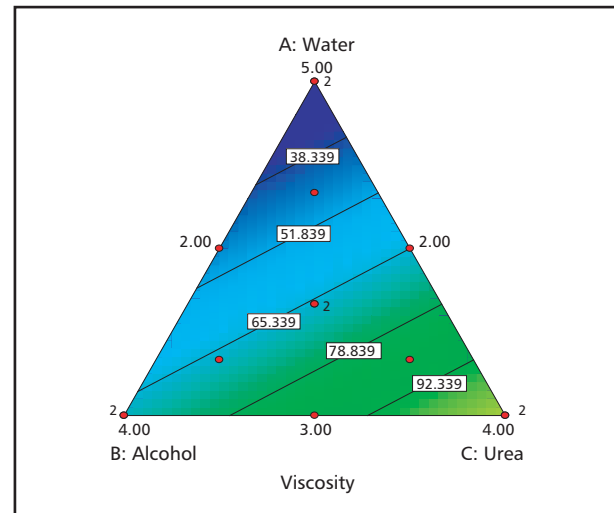
Prerequisites: Prior knowledge of DOE (EDME or equivalent). **Fee:** \$1295 for 2 days (\$1095 if you send 3+ students). **Fee Includes:** Course materials and a link to a time-limited version of Design-Expert software. **Optional:** *RSM Simplified* book by Anderson & Whitcomb (1.6 CEU's).

Mixture Design for Optimal Formulations (MIX)—2 days

If you create product formulations, you need the mixture design knowledge taught in *Mixture Design for Optimal Formulations*. Develop statistical models of your product performance. Then use response surface optimization methods to identify that "sweet spot" where all specifications can be achieved.

During the *Mixture Design for Optimal Formulations* workshop you will:

- Set up simplex or optimal designs tailored for mixtures
- Augment and evaluate design quality
- Select appropriate mixture models
- Generate contour plots in triangular space
- Design for constrained mixture variables
- Optimize product formulas
- Screen mixture components.

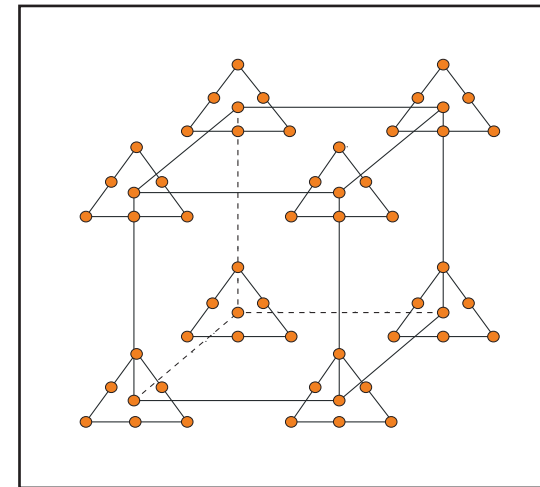


Practice designing and analyzing mixture experiments during the workshop. Design-Expert software provides the power to generate optimal designs as well as sophisticated graphical outputs such as trace plots. You learn how these methods work and what to look for in *Mixture Design for Optimal Formulations*.

Prerequisites: Knowledge of basic statistics and analysis of variance (ANOVA), covered in *Basic Statistics for DOE*, is recommended. **Fee:** \$1295 for 2 days (\$1095 if you send 3+ students). **Fee Includes:** Course materials and a link to a time-limited version of Design-Expert software.

Advanced Formulations: Combining Mixture & Process Variables (MIX2)—2 days

In this advanced workshop, learn state-of-the-art tools for design and analysis of experiments on mixtures, and how to incorporate process variables. In the end you will know how to mix your cake, bake it, and ice it too using optimal designs.



During the Advanced Formulations workshop you will:

- Set up optimal designs that combine mixture components and process factors
- Learn how to deal with both mixture composition and the amount applied
- Contend with categoric variables, such as material type
- Combine one mixture with another (frosting on the cake)
- Map mixtures to process space via ratios, thus enabling application of factorials and response surface methods (RSM)

Design-Expert® software helps you practice designing and analyzing mixture-process and other combined experiments throughout the workshop. The software provides the power for generation of optimal designs, as well as sophisticated numerical optimization tools for seeking out the sweet spots.

Prerequisites: Knowledge of the basics of mixture design, covered in the *Mixture Design for Optimal Formulations* workshop, is a prerequisite. **Fee:** \$1495 for 2 days (\$1195 if you send 3+ students). **Fee Includes:** Course materials and a link to a time-limited version of Design-Expert software. (1.6 CEU's).

Designed Experiments for Life Sciences (DELS)—2 days

In this one-of-a-kind hands-on workshop, learn how to apply DOE to life science problems. We've designed it for scientists, engineers, and technical professionals working in the pharmaceutical, biomedical technology, and biomedical device fields as well as organizations and institutions that devote the majority of their efforts to research, development, technology transfer, or commercialization of these fields. Throughout this course you explore cases that come directly from life science industries!



During this fast-paced two days you explore fractional factorial designs for the screening and characterization of products or processes. Also see how to achieve top performance via response surface designs, mixture designs, and multiple response optimization. Practice applying all these DOE tools while working through cases involving titration curves, medical device design, assay optimization, expiry dating, and much more.

Stat-Ease's highly experienced DOE experts provide you with individualized guidance and support after class to help you get started on your next project—at no extra cost! Two optional fun and easy-to-read texts, *DOE Simplified* and *RSM Simplified*, authored by Mark Anderson and Pat Whitcomb, provide supplemental background reading for all DOE topics covered.

Prerequisites: Math skills, basic statistics. **Fee:** \$1495 (\$1195 if you send 3+ students). **Fee Includes:** Course materials and a link to a time-limited version of Design-Expert software. **Optional:** *DOE Simplified* and *RSM Simplified* books by Anderson & Whitcomb (1.6 CEU's)