Experimental Design Methods Using QualPro’s 12-Step MVT® Process

Of all the statistical techniques QualPro teaches, design of experiments is the most powerful. Experimental design techniques enable managers to dramatically enhance their quality improvement efforts. While traditional scientific methods change only one factor at a time, QualPro’s simple and practical methods are both low cost and quickly implemented without compromising the power or validity of the underlying statistical techniques. QualPro’s 12-Step MVT® Process puts experimental design techniques where they will be most powerful—in the hands of many people in the organization rather than a select few statisticians. This four-day seminar teaches the fundamental concepts of experimental design. Realistic examples and actual case studies from various industries are used to enhance the understanding of key points. Our seminar content is presented as a simple, step-by-step approach to experimental design with minimal technical detail and emphasizes the use of statistical techniques—and statistical software—to uncover opportunities for breakthrough improvement.

You will leave this seminar with an experiment designed to improve a specific process or problem in your organization. You will identify the problem you wish to improve, we will help you design the experiment, and you will return to work ready to execute it.

Participants should include managers, engineers, technicians, production supervisors, statisticians, operations personnel, and quality control and laboratory analysts.

Course Outline

Introduction
- History of experimental design
- QualPro’s 12-Step MVT® Process
- Definition of “improving quality”
- Testing for stability
- Evaluating process capability

Fundamental Concepts
- The fallacy of “holding conditions constant” (testing one factor at a time)
- Advantages of factorials
- Language of experimental design
- Principles of experimentation

Factorial Designs
- 2^n factorial experiments
- QualPro analysis procedure
  - Main factor effects
  - Interaction effects
  - Effects on consistency
- Checking for low variance conditions
- Randomization
- Assessing curvature
- Blocking
- Obstacles to the use of experimental design

Practical Management of Experimental Design
- Brainstorming factors
- Categorizing factors as practical, fast, and cost free
- Screening experimentation
- Refining experimentation
- Group exercise in applying the designs in the development of a process

Screening Designs
- QualPro’s screening designs
- Reflection
- Dummy variables

Evolutionary Operation (EVOP)
- EVOP design and analysis
- EVOP benefits

Preview of Advanced Experimental Design
- Response surface methodology
- Multi-level designs
- Mixture designs

Call 865-927-0491 or email seminars@qualproinc.com to learn more