



# IMS ASSOCIATES PROGRAM

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## INTRODUCTION TO STATISTICAL DESIGN OF EXPERIMENTS

An IMS Associates Program  
Short Course

October 16-17, 2013

### About this Course

This two-day course will be hands-on beginning with statistical experimental designs such as the t-test, as well as one-way and multi-way factorial design. Understanding and interpreting experimental output will be given high priority. Multiple sources of variability and blocking will be considered. Special design types like screening designs, Box-Behnken designs, Orthogonal Arrays (Taguchi), Plackett-Burman (Screening) designs and other response surface designs will be included. Factorial designs, which allow the determination of the effect of important parameters and their interaction with each other, will be considered. When there are a number of different parameters, Fractional Factorial designs along with their resolution are studied because they can be more efficient. For all designs we will see how to analyze the results both analytically and graphically. We will also consider using experiments sequentially so that prior experiments can be easily combined with current results. How to handle hard-to-change factors will be considered. Finally, sample size and power calculation, which give the engineer insight into whether or not a proposed experiment is worthwhile, will be introduced.

### About Your Instructor

Professor Koehn received his Ph.D. in Statistics from the University of Illinois at Urbana-Champaign. He was Head of the Department of Statistics at the University of Connecticut for 12 years and directed the department's statistical consulting service for more than 25 years. Having taken emeritus status, he is devoting his time to statistical consulting and research. He has consulted with and taught short courses to more than 30 companies and organizations, as well as having worked with numerous engineers and scientists within the University. He has had a long association with the Institute of Materials Science. Professor Koehn's consulting in the scientific and engineering fields has involved experiments in the biological and physical sciences as well as processes in manufacturing and chemical engineering. He is particularly interested in problems in process optimization. He also supports industry outreach and materials problem solving for the IMS Associates Program.

### Who Should Attend

Engineers and scientists wishing to increase the power of their experiments by using statistical design of experiments (DoE). The equivalent of one college statistics course would be desirable.