Design and Analysis of Experiments, Introduction to Experimental Design (Volume 1)

By Klaus Hinkelmann, Oscar Kempthorne

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This user-friendly new edition reflects a modern and accessible approach to experimental design and analysis

Design and Analysis of Experiments, Volume 1, Second Edition provides a general introduction to the philosophy, theory, and practice of designing scientific comparative experiments and also details the intricacies that are often encountered throughout the design and analysis processes. With the addition of extensive numerical examples and expanded treatment of key concepts, this book further addresses the needs of practitioners and successfully provides a solid understanding of the relationship between the quality of experimental design and the validity of conclusions.

This Second Edition continues to provide the theoretical basis of the principles of experimental design in conjunction with the statistical framework within which to apply the fundamental concepts. The difference between experimental studies and observational studies is addressed, along with a discussion of the various components of experimental design: the error-control design, the treatment design, and the observation design. A series of error-control designs are presented based on fundamental design principles, such as randomization, local control (blocking), the Latin square principle, the split-unit principle, and the notion of factorial treatment structure. This book also emphasizes the practical aspects of designing and analyzing experiments and features:

- Increased coverage of the practical aspects of designing and analyzing experiments, complete with the steps needed to plan and construct an experiment
- A case study that explores the various types of interaction between both treatment and blocking factors, and numerical and graphical techniques are provided to analyze and interpret these interactions
- Discussion of the important distinctions between two types of blocking factors and their role in the process of drawing statistical inferences from an experiment

- A new chapter devoted entirely to repeated measures, highlighting its relationship to split-plot and split-block designs
- Numerical examples using SAS® to illustrate the analyses of data from various designs and to construct factorial designs that relate the results to the theoretical derivations

Design and Analysis of Experiments, Volume 1, Second Edition is an ideal textbook for first-year graduate courses in experimental design and also serves as a practical, hands-on reference for statisticians and researchers across a wide array of subject areas, including biological sciences, engineering, medicine, pharmacology, psychology, and business.

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Editorial Review

Review

“This user-friendly new edition reflects a modern and accessible approach to experimental design and analysis.” (*Landtechnik*, 1 November 2012)

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From the Publisher
Provides readers with a solid understanding of the philosophical basis and principles of experimental design. Contains a broad knowledge of available designs together with their assumptions, construction, use and analysis. Draws a sharp distinction between observational and intervention studies, especially in connection with the analysis of data. Coverage includes a detailed discussion of linear models theory, various error-control designs and factorial experiments.

From the Back Cover

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