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Nota di bibliografia	Includes bibliographical references and indexes.
Nota di contenuto	Modern Experimental Design; Contents; Preface; 1 Introduction; 1.1 Experiments All Around Us; 1.2 Objectives for Experimental Designs; 1.3 Planned Experimentation versus Use of Observational Data; 1.4 Basic Design Concepts; 1.4.1 Randomization; 1.4.2 Replication versus Repeated Measurements; 1.4.3 Example; 1.4.4 Size of an Effect That Can be Detected; 1.5 Terminology; 1.6 Steps for the Design of Experiments; 1.6.1 Recognition and Statement of the Problem; 1.6.2 Selection of Factors and Levels; 1.6.2.1 Choice of Factors; 1.6.2.2 Choice of Levels 1.7 Processes Should Ideally be in a State of Statistical Control 1.8 Types of Experimental Designs; 1.9 Analysis of Means; 1.10 Missing Data; 1.11 Experimental Designs and Six Sigma; 1.12 Quasi-Experimental Design; 1.13 Summary; References; Exercises; 2 Completely Randomized Design; 2.1 Completely Randomized Design; 2.1.1 Model; 2.1.2 Example: One Factor, Two Levels; 2.1.2.1 Assumptions; 2.1.3 Examples: One Factor, More Than Two Levels; 2.1.3.1 Multiple Comparisons; 2.1.3.2 Unbalanced and Missing Data; 2.1.3.3 Computations; 2.1.4 Example Showing the Effect of Unequal Variances

2.2 Analysis of Means 2.2.1 ANOM for a Completely Randomized Design; 2.2.1.1 Example; 2.2.2 ANOM with Unequal Variances; 2.2.2.1 Applications; 2.2.3 Nonparametric ANOM; 2.2.4 ANOM for Attributes Data; 2.3 Software for Experimental Design; 2.4 Missing Values; 2.5 Summary; Appendix; References; Exercises; 3 Designs that Incorporate Extraneous (Blocking) Factors; 3.1 Randomized Block Design; 3.1.1 Assumption; 3.1.2 Blocking an Out-of-Control Process; 3.1.3 Efficiency of a Randomized Block Design; 3.1.4 Example; 3.1.4.1 Critique; 3.1.5 ANOM; 3.2 Incomplete Block Designs 3.2.1 Balanced Incomplete Block Designs 3.2.1.1 Analysis; 3.2.1.2 Recovery of Interblock Information; 3.2.1.3 ANOM; 3.2.2 Partially Balanced Incomplete Block Designs; 3.2.2.1 Lattice Design; 3.2.3 Nonparametric Analysis for Incomplete Block Designs; 3.2.4 Other Incomplete Block Designs; 3.3 Latin Square Design; 3.3.1 Assumptions; 3.3.2 Model; 3.3.3 Example; 3.3.4 Efficiency of a Latin Square Design; 3.3.5 Using Multiple Latin Squares; 3.3.6 ANOM; 3.4 Graeco-Latin Square Design; 3.4.1 Model; 3.4.2 Degrees of Freedom Limitations on the Design Construction 3.4.3 Sets of Graeco-Latin Square Designs 3.4.4 Application; 3.4.5 ANOM; 3.5 Youden Squares; 3.5.1 Model; 3.5.2 Lists of Youden Designs; 3.5.3 Using Replicated Youden Designs; 3.5.4 Analysis; 3.6 Missing Values; 3.7 Software; 3.8 Summary; References; Exercises; 4 Full Factorial Designs with Two Levels; 4.1 The Nature of Factorial Designs; 4.2 The Deleterious Effects of Interactions; 4.2.1 Conditional Effects; 4.2.1.1 Sample Sizes for Conditional Effects Estimation; 4.2.2 Can We "Transform Away" Interactions?; 4.3 Effect Estimates; 4.4 Why Not One-Factor-at-a-Time Designs? 4.5 ANOVA Table for Unreplicated Two-Factor Design?

Sommario/riassunto

A complete and well-balanced introduction to modern experimental design. Using current research and discussion of the topic along with clear applications, Modern Experimental Design highlights the guiding role of statistical principles in experimental design construction. This text can serve as both an applied introduction as well as a concise review of the essential types of experimental designs and their applications. Topical coverage includes designs containing one or multiple factors, designs with at least one blocking factor, split-unit designs and their variations as