



# The Principles of Experimental Research

By K Srinagesh

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## The Principles of Experimental Research By K Srinagesh

The need to understand how to design and set up an investigative experiment is nearly universal to all students in engineering, applied technology and science, as well as many of the social sciences. Many schools offer courses in this fundamental skill and this book is meant to offer an easily accessible introduction to the essential tools needed, including an understanding of logical processes, how to use measurement, the do's and don'ts of designing experiments so as to achieve reproducible results and the basic mathematical underpinnings of how data should be analyzed and interpreted. The subject is also taught as part of courses on Engineering statistics, Quality Control in Manufacturing, and Senior Design Project, in which conducting experimental research is usually integral to the project in question.

\* Covers such essential fundamentals as "definitions," "quantification," and standardization of test materials

\* Shows students and professionals alike how to plan an experiment?from how to frame a proper Hypothesis to designing an experiment to accurately reflect the nature of the problem to "designing with factors."

\* Includes a separate section on the use of Statistics in Experimental Research, including overview of probability and statistics, as well as Randomization, Replication and Sampling, as well as proper ways to draw statistical inferences from experimental data.

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## **Editorial Review**

From the Back Cover

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Technology: Engineering. General

Principles of Experimental Research

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Professor, Mechanical Engineering

University of Massachusetts, Dartmouth

### **KEY FEATURES**

- How to plan an experiment?from framing a proper Hypothesis, to designing an experiment that accurately reflects the nature of the problem, to “designing with factors”
- Covers such essential fundamentals “definitions,” “quantification,” and standardization of test materials
- Whole section on the “Art of Reasoning,” covering general logical paradigms as well as the specific use of such symbolic logics as conjunctions, disjunctions, conditional statements, negation and more
- Separate Section on the use of Statistics in Experimental Research, including overview of probability and statistics, as well as Randomization, Replication and Sampling

Principles of Experimental Research is an introductory textbook on all fundamental aspects of designing and conducting experiments for quantitative research. It addresses the nearly universal need among engineers and scientists to understand how to design and set up an investigative experiment. This book offers an easily accessible introduction to the essential tools needed, an understanding of logical processes, how to use measurement, the correct approaches to designing experiments that will achieve reproducible results, and how data should be analyzed and interpreted.

The main emphasis of Principles of Experimental Research is on all the essential mathematical and logics tools needed to design, set up and run a successful engineering or scientific experiment?either as part of an introduction to lab techniques or as part of basic fundamentals of research. Unlike other similar texts, this books does not presume a strong background in statistics, but still offers a solid review of the needed statistical tools for doing proper analysis and drawing correct conclusions.

Contents: Introduction of experimental research; The Fundamentals, The Importance of Definition; Aspects of Quantification; The Purpose and Principles Involved in Experimenting;

Related titles:

Nelson et al.: Introductory Statistics for Engineering Experimentation ( 0-12-515423-2)

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