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Distributions In The Physical And Engineering Sciences: Distributional And Fractal Calculus, Integral Transforms And Wavelets (Applied And Numerical Harmonic Analysis)

Synopsis

A comprehensive exposition on analytic methods for solving science and engineering problems, written from the unifying viewpoint of distribution theory and enriched with many modern topics which are important to practioners and researchers. The book is ideal for a general scientific and engineering audience, yet it is mathematically precise.

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Customer Reviews

"In the book under review, the mathematical rigor, the modern level of the material and its accessibility to students of physical and engineering specialties are reached due to very accurate explanations which use associations and examples more suitable for that kind of audience. Very nice models, e.g., 'the camel passing through a needle's eye' and 'the beetle on a rubber string' for the explanation of asymptotic notations and ideas...adorn this work and make it a good textbook.... Each chapter contains a section of exercises well chosen for the themes developed in the main text. The reviewer has...made use already of this book in his seminar work with students of different levels of preparation in engineering specialties and...congratulates the authors on this good and useful textbook.... Strongly recommended to graduate students almost independently of their concrete physical or engineering specialty as well as to seminar or curricular work with undergraduate students." --Zeitschrift fÃƒÂ r Analysis und ihre Anwendungen

Distributions in the Physical and Engineering Sciences is a comprehensive exposition on analytic methods for solving science and engineering problems. It is written from the unifying viewpoint of distribution theory and enriched with many modern topics which are important for practitioners and researchers. The goal of the books is to give the reader, specialist and non-specialist, useable and modern mathematical tools in their research and analysis. This new text is intended for graduate students and researchers in applied mathematics, physical sciences and engineering. The careful explanations, accessible writing style, and many illustrations/examples also make it suitable for use as a self-study reference by anyone seeking greater understanding and proficiency in problem solving methods presented. The book is ideal for a general scientific and engineering audience, yet it is mathematically precise.

I have used this book for its introduction to the treatment of the delta function, Heavside function, and sign function. Although many useful examples are provided, including the discussion of the derivative of the sign function as twice the absolute value (p.23), I find many of the proofs somewhat cryptic and difficult to follow. A simpler and easier to understand treatment (though, perhaps, less complete) is provided by Bellman and Cooke.It is also interesting that a discussion of wavelets is included in this book.

This book provides a simple, example-based discussion of its subtle subject matter which will have you conversant in the material in no time. It gets to the ideas of the subject without making you wade through pages of formalism and abstraction first. This is science writing at its best.

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