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Applied Functional Analysis: Applications To Mathematical Physics (Applied Mathematical Sciences) (v. 108)



Synopsis

The first part of a self-contained, elementary textbook, combining linear functional analysis, nonlinear functional analysis, numerical functional analysis, and their substantial applications with each other. As such, the book addresses undergraduate students and beginning graduate students of mathematics, physics, and engineering who want to learn how functional analysis elegantly solves mathematical problems which relate to our real world. Applications concern ordinary and partial differential equations, the method of finite elements, integral equations, special functions, both the Schroedinger approach and the Feynman approach to quantum physics, and quantum statistics. As a prerequisite, readers should be familiar with some basic facts of calculus. The second part has been published under the title, Applied Functional Analysis: Main Principles and Their Applications.

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Customer Reviews

This is a incredible book on applied functional analyses. Every topic is motivated with an applied problem. The definitions are motivated either by the application or by the subsequent use. There are remainders showing you the inteconnections between the subjects and finally the index and the Symbols index are both complete and very usefull. The book is not complete. However he missing subjects usually are in the other colection by the same author.

This well-written text covers the fundamentals of modern linear operator theory and points out most of its connections to other branches of mathematics and physics (differential equations, integral equations, finite elements, elasticity, quantum mechanics, and more). It includes all the basic theory on Banach spaces, Hilbert spaces, orthogonality, Fourier series, etc., and a chapter on the PDE's of mathematical physics. The excercises are both illustrating and challenging. I find it useful for undergrads, graduate students, and as a reference for working mathematicians. Must read companion volume 109 also. Please check my other reviews in my member page (just click on my name above).

Prof. Zeidler has done the world of mathematicians an incredible service by writing this book. It is self-contained, very lucid, beautifully organised, and actually takes the trouble to relate various topics to each other. It makes the field of Functional Analysis more accessible to students taking their first course in it. It also is a handy reference for practicing mathematicians. I loved the little schematics in the book which point out connections between seemingly disconnected ideas. All in all- a great book. If you don't have it, and are interested enough in Math to be reading this review- go buy it!!!!

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