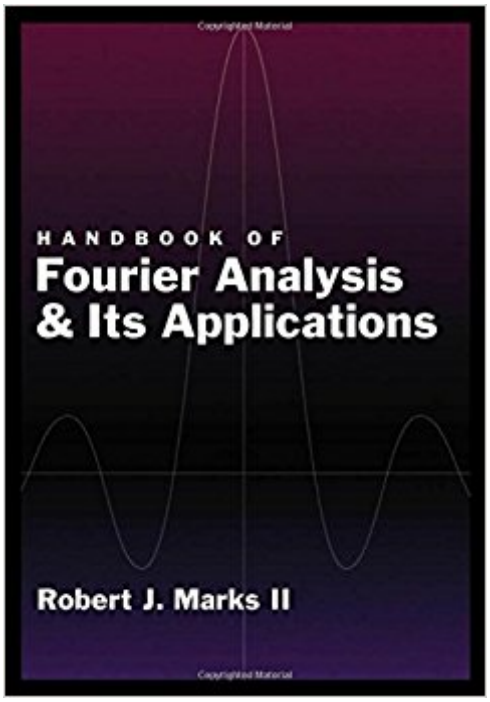
Handbook Of Fourier Analysis & Its Applications



Synopsis

Fourier analysis has many scientific applications - in physics, number theory, combinatorics, signal processing, probability theory, statistics, option pricing, cryptography, acoustics, oceanography, optics and diffraction, geometry, and other areas. In signal processing and related fields, Fourier analysis is typically thought of as decomposing a signal into its component frequencies and their amplitudes.This practical, applications-based professional handbook comprehensively covers the theory and applications of Fourier Analysis, spanning topics from engineering mathematics, signal processing and related multidimensional transform theory, and quantum physics to elementary deterministic finance and even the foundations of western music theory.As a definitive text on Fourier Analysis, Handbook of Fourier Analysis and Its Applications is meant to replace several less comprehensive volumes on the subject, such as Processing of Multifimensional Signals by Alexandre Smirnov, Modern Sampling Theory by John J. Benedetto and Paulo J.S.G. Ferreira, Vector Space Projections by Henry Stark and Yongyi Yang and Fourier Analysis and Imaging by Ronald N. Bracewell. In addition to being primarily used as a professional handbook, it includes sample problems and their solutions at the end of each section and thus serves as a textbook for advanced undergraduate students and beginning graduate students in courses such as: Multidimensional Signals and Systems, Signal Analysis, Introduction to Shannon Sampling and Interpolation Theory, Random Variables and Stochastic Processes, and Signals and Linear Systems.

Book Information

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Customer Reviews

"More than merely a compendium of modern case studies showing how one makes the power of Fourier analysis apply in the real world. Recommended."--Choice

Robert J. Marks II, Ph.D., is Distinguished Professor of Engineering in the Department of Engineering at Baylor University. He came to Baylor University after 26 years at the University of Washington in Seattle. Robert J. Marks II has eight books (author, co-author, editor or co-editor) published by IEEE, MIT Press and Oxford University Press, three patents, over 50 supervised doctoral dissertations and masters theses, and over 300 publications.

This is an excellent reference book on linear systems, time, frequency and time-frequency representation of signals and related topics. It covers a lot of ground and touches upon topics not usually found in introductory books on "signals and systems". For instance, there is a full chapter on Probability, Random Variables and Stochastic Processes and there are two chapters on sampling theory, including generalizations of the classical "Shannon sampling theorem" and even historical notes, not to mention the application related material. This is not a book for beginners who will most likely find that there are not sufficient details on some topics, as the author just moves on so quickly. Also, even though it brings a fair amount of exercises and helpful illustrations, I would be reluctant to use this book as a textbook. On the other hand, regardless if you are planning to teach or take an advanced course on Signals and Systems, by all means, have this book handy! I was particularly impressed with its list of references (almost 1600!) and a very detailed and helpful index.

I learned much of this material from Marks when I was his grad student. I won’t get rid of the books we used then but do plan to turn to this one first as a reference. The homework problems with selected solutions would also make this ideal for a course adoption in one of several topics. I agree with the previous reviewer that there’s a lot of material here that one won’t find in other books, and that the exposition is superior.

This book is not organized as a handbook,that you would open to find an answer to your question.Instead of answers it has exercises for the reader.Its lack of clarity and details, would make it a poor choice for a textbook

I studied under the author as a graduate student, and this book (which was still being completed at the time) was the textbook for a number of his courses. The breadth of topics covered in this book is

impressive; when the author says that the book can serve as a textbook for four or five different courses, that’s probably an understatement. The author delves into each topic with details, equations, and illustrations that go far beyond the overview that you would expect from a "handbook". Not only does the author detail the academic details of Fourier, he also draws on his experience and past research projects to provide real-world applications that are easy to visualize. The writing is clear and easy to follow, especially considering the complexity of the subject matter.My main complaint about this book is the misleading title. You would be hard-pressed to find a human being with hands large enough that this would be considered a "handbook". This is not a handbook that you would carry around with you (unless there’s a Kindle edition, of course). It is, however, an excellent book to have on your shelf.Overall, I found this book to be a great resource for a graduate level course. Since it encompasses far more than what could be taught in a single course, it gives the reader everything they need in order to go the "next step" and discover applications and concepts beyind what is taught in class. This book went beyond teaching me concepts and truly showed me the "joy of Fourier".