TEXTBOOKS IN MATHEMATICS

Principles of Fourier Analysis

SECOND EDITION

Kenneth B. Howell

CRC Press
Taylor & Francis Group
A CHAPMAN & HALL BOOK

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The University of Alabama in Huntsville
USA

CRC Press
Taylor & Francis Group
Boca Raton London New York
CRC Press is an imprint of the
Taylor & Francis Group, an informa business
A CHAPMAN & HALL BOOK

Contents

Mathematics

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Principles of Fourier Analysis develops the four core theories of Fourier analysis—the classical theory for Fourier series, the classical theory for Fourier transforms, the generalized theory uniting and extending the classical theories, and the theory for discrete Fourier transforms and FFTs.

The text is written in an engaging style, with the reader motivated and enlightened through the use of easily understood arguments and examples. Any non-rigorous development is later backed up by solid, mathematically rigorous arguments. As the author says, "Good proofs keep us honest."

This book serves as a text and reference for everyone who uses or may use Fourier analysis, including the beginning student first discovering Fourier analysis and the more advanced student desiring a deeper understanding. This book may also be used in a general applied analysis course. Parts should be of interest to professionals who are already experts in Fourier analysis since the generalized theory presented here substantially extends the theory presented elsewhere.

New to this Edition

- A brief discussion of the Haar wavelets
- The construction of a continuous, periodic function with a divergent Fourier series
- A brief discussion of the classic sampling theorem for band-limited functions
- A short chapter on multi-dimensional Fourier transforms
- A discussion relating the Fourier and Laplace transforms

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ISBN 978-1-03-247700-8
9 781032 477008