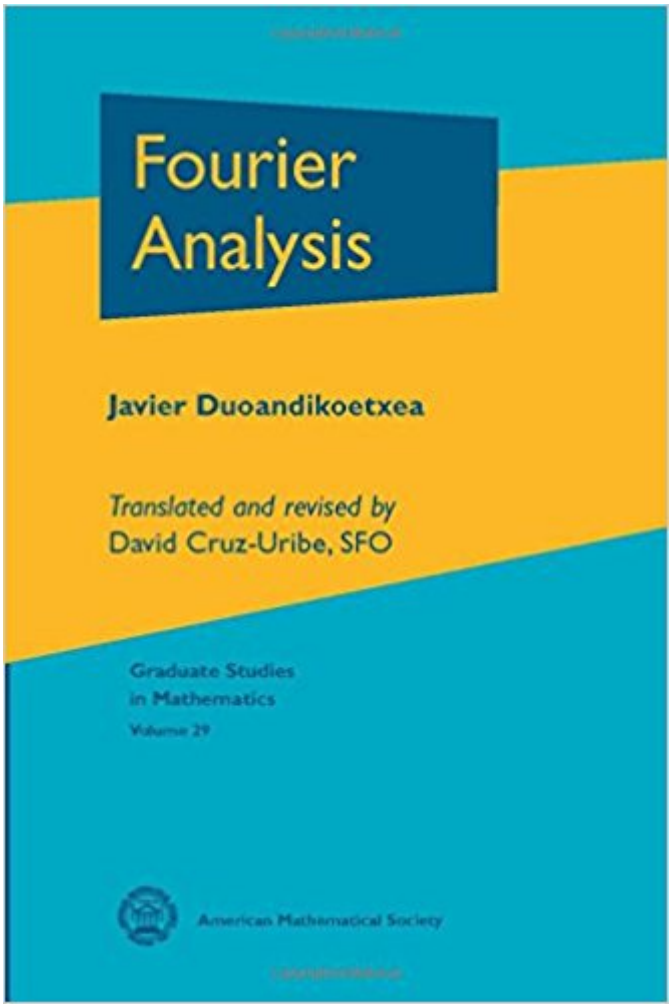
Fourier Analysis (Graduate Studies In Mathematics)



Synopsis

Fourier analysis encompasses a variety of perspectives and techniques. This volume presents the real variable methods of Fourier analysis introduced by CalderÃƒÂ n and Zygmund. The text was born from a graduate course taught at the Universidad AutÃƒÂ noma de Madrid and incorporates lecture notes from a course taught by JosÃƒÂ© Luis Rubio de Francia at the same university. Motivated by the study of Fourier series and integrals, classical topics are introduced, such as the Hardy-Littlewood maximal function and the Hilbert transform. The remaining portions of the text are devoted to the study of singular integral operators and multipliers. Both classical aspects of the theory and more recent developments, such as weighted inequalities, H^1, BMO spaces, and the $T1$ theorem, are discussed. Chapter 1 presents a review of Fourier series and integrals; Chapters 2 and 3 introduce two operators that are basic to the field: the Hardy-Littlewood maximal function and the Hilbert transform. Chapters 4 and 5 discuss singular integrals, including modern generalizations. Chapter 6 studies the relationship between H^1, BMO, and singular integrals; Chapter 7 presents the elementary theory of weighted norm inequalities. Chapter 8 discusses Littlewood-Paley theory, which had developments that resulted in a number of applications. The final chapter concludes with an important result, the $T1$ theorem, which has been of crucial importance in the field. This volume has been updated and translated from the Spanish edition that was published in 1995. Minor changes have been made to the core of the book; however, the sections, "Notes and Further Results" have been considerably expanded and incorporate new topics, results, and references. It is geared toward graduate students seeking a concise introduction to the main aspects of the classical theory of singular operators and multipliers. Prerequisites include basic knowledge in Lebesgue integrals and functional analysis.

Book Information

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Customer Reviews

"This is a great introductory book to Fourier analysis on Euclidean spaces and can serve as a textbook in an introductory graduate course on the subject ... The chapters on the Hardy-Littlewood maximal function and the Hilbert transform are extremely well written ... this is a great book and is highly recommended as an introductory textbook to Fourier analysis. The students will have a lot to benefit from in the simple and quick presentation of the book." ---- Mathematical Reviews

I am reading this book for further study following a reading course I took with a Dr. Mikhail Vishik, who recommended me the book, in the fall of 2013.The development is very terse, but a course in generalized functions (distributions) - in my experience, from Rudin’s Functional Analysis, chapters 6 and 7 - should prepare the reader both so that he may read the book competently and that he may gain a philosophical appreciation for it. Those familiar with the Princeton series on analysis by Stein & Shakarchi also may enjoy some nostalgia in reading Duoandikoetxea.The book "emphasizes the real variable methods developed by Calderon and Zygmund", so other beautiful results like the distributional Paley-Wiener theorems are absent.

This book is just what I expected it to be. It is a very concise and clear introduction to Fourier Analysis.

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