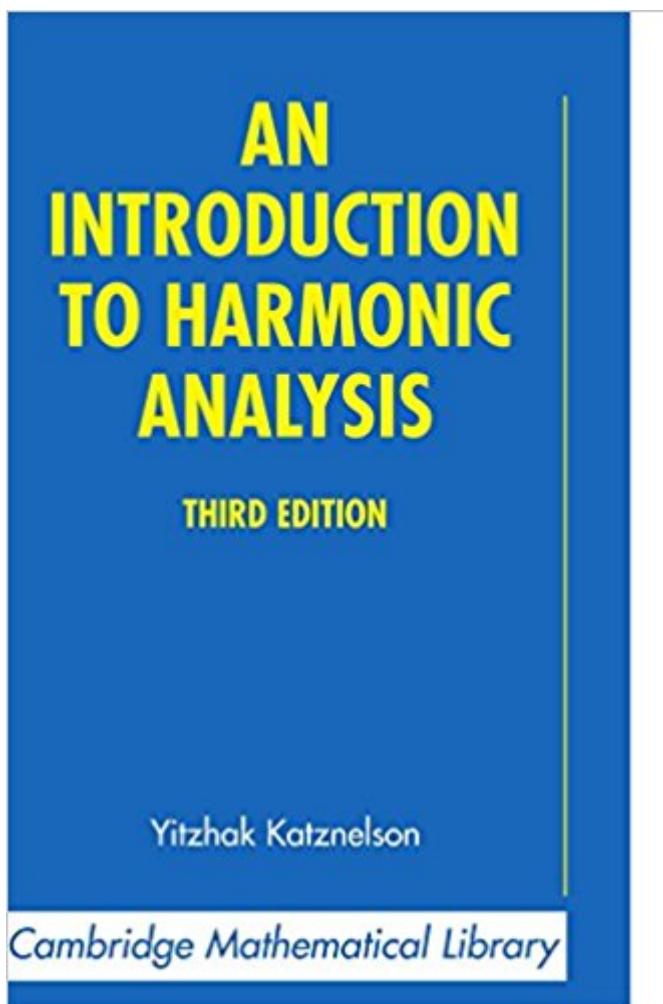


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# An Introduction To Harmonic Analysis (Cambridge Mathematical Library)



## Synopsis

Awarded the American Mathematical Society Steele Prize for Mathematical Exposition, this Introduction, first published in 1968, has firmly established itself as a classic text. Yitzhak Katznelson demonstrates the central ideas of harmonic analysis and provides a stock of examples to foster a clear understanding of the theory. This new edition has been revised to include several new sections and a new appendix.

## Book Information

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## Customer Reviews

"Katznelson's An Introduction to Harmonic Analysis is, of course, a classic...So the first thing to say is 'thank you,' to Cambridge for doing this new edition, and to Prof. Katznelson for undertaking the task of updating his book...It is an ambitious book, moving all the way from Fourier series to Banach algebras and analysis on locally compact abelian groups. It is densely but clearly written, with the occasional flash of wit." MAA Reviews, Fernando Q. Gouvea

First published in 1968, this Introduction has firmly established itself as a classic text and a favorite for students and experts alike. Yitzhak Katznelson begins with an exposition of classical Fourier series. His aim is to demonstrate the central ideas of harmonic analysis and provide a stock of examples to foster a clear understanding of the theory. This new edition has been revised to include several new sections and a new appendix.

When the first edition of Katznelson's book appeared back in 1968 (when I was a student), it soon became the talked about, and universally used, reference volume for the standard tools of harmonic analysis: Fourier series, Fourier transforms, Fourier analysis/synthesis, the math of time-frequency filtering, causality ideas,  $H^p$ -spaces, and the various incarnations of Norbert Wiener's ideas on the Fourier transform in the complex domain, Paley-Wiener, spectral theory, and more. It is easy to pick up the essentials in this lovely book. Now, many years later, I occasionally ask beginning students what their favorite reference is on things like that, and more often than not, it is Katznelson. Thanks to Dover, it is on the shelf of most university bookstores, and priced under US\$ 10.

This is an excellent introduction to abstract harmonic analysis. It is written at a reasonable advanced level; know your measure theory and some functional analysis ahead of time! Many of the exercises at the ends of the sections are difficult. There are typos, so be sharp!

Love it!!

Katznelson includes good topics, but for each topic in this book there is a better place to learn it from. For my taste, Grafakos, *Classical Fourier Analysis* (Graduate Texts in Mathematics), is strictly better than Katznelson. It includes almost all the same content, but does things in more detail and the presentation is more clear. In fact Grafakos is better both for the learner and as a reference. Another harmonic analysis book that is easy to understand and has great chapters on probability and wavelets is Pinsky, *Introduction to Fourier Analysis and Wavelets* (Graduate Studies in Mathematics). For the Gelfand theory of Banach algebras, my favorite book is Rudin's "Functional Analysis". A book that is rather similar to Katznelson is Muscalu and Schlag, *Classical and Multilinear Harmonic Analysis* (Cambridge Studies in Advanced Mathematics) (Volume 1), and Muscalu and Schlag are interested in partial differential equations which Katznelson has nothing to say about. If you are learning harmonic analysis on your own, I recommend looking through the above books rather than using Katznelson. But if you are taking a course that follows Katznelson, let me say that it is not a bad book and if you have someone to ask questions you will indeed be able to learn from it.

This is a great book for looking at classical harmonic analysis: the study of Fourier Series on the "typical" groups, includes a quick look at the general situation and ends with an introduction to commutative Banach Algebras. Both topics are continued in [Loomis].

Katzenelson's book considers harmonic analysis primarily on the circle group. He does this from a thoroughly modern point of view. An understanding of the basic ideas of Banach spaces is required. This book should be on the shelf of any aspiring Harmonic Analyst, especially one with an abstract viewpoint.

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