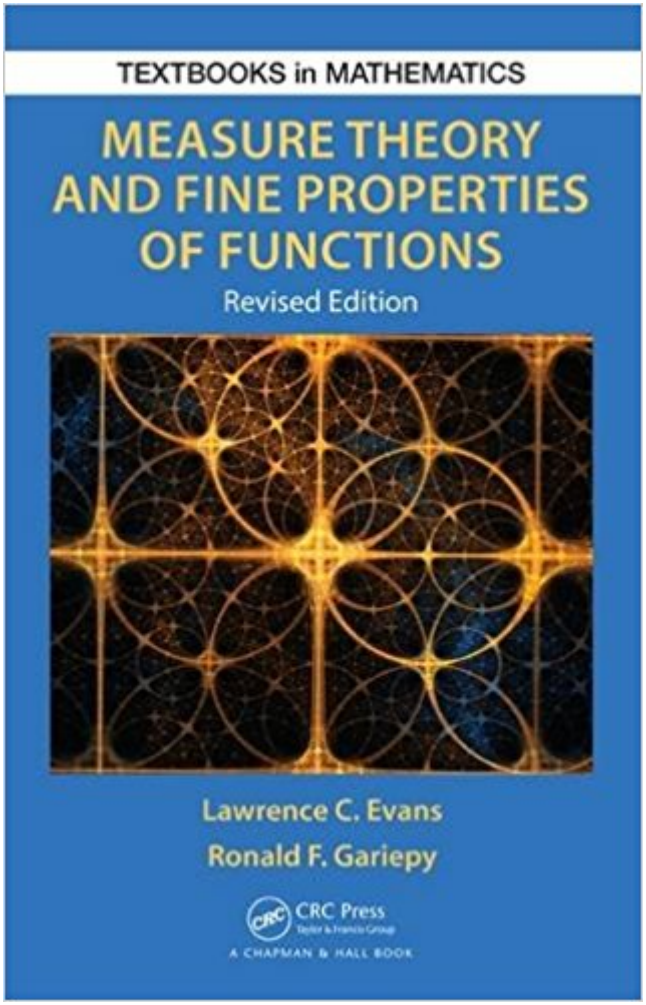
Measure Theory And Fine Properties Of Functions, Revised Edition (Textbooks In Mathematics)



Synopsis

Measure Theory and Fine Properties of Functions, Revised Edition provides a detailed examination of the central assertions of measure theory in n-dimensional Euclidean space. The book emphasizes the roles of Hausdorff measure and capacity in characterizing the fine properties of sets and functions. Topics covered include a quick review of abstract measure theory, theorems and differentiation in Ã¢â Â•n, Hausdorff measures, area and coarea formulas for Lipschitz mappings and related change-of-variable formulas, and Sobolev functions as well as functions of bounded variation. The text provides complete proofs of many key results omitted from other books, including Besicovitch's covering theorem, Rademacher's theorem (on the differentiability a.e. of Lipschitz functions), area and coarea formulas, the precise structure of Sobolev and BV functions, the precise structure of sets of finite perimeter, and Aleksandrov's theorem (on the twice differentiability a.e. of convex functions). This revised edition includes countless improvements in notation, format, and clarity of exposition. Also new are several sections describing the Ã•â ¬-Ã Â» theorem, weak compactness criteria in L1, and Young measure methods for weak convergence. In addition, the bibliography has been updated. Topics are carefully selected and the proofs are succinct, but complete. This book provides ideal reading for mathematicians and graduate students in pure and applied mathematics.

Book Information

Series: Textbooks in Mathematics
Hardcover: 313 pages
Publisher: Chapman and Hall/CRC; 1 edition (April 14, 2015)
Language: English
ISBN-10: 1482242389
ISBN-13: 978-1482242386
Product Dimensions: 6.1 x 0.9 x 9.3 inches
Shipping Weight: 1.3 pounds (View shipping rates and policies)
Average Customer Review: 5.0 out of 5 stars 2 customer reviews
Best Sellers Rank: #486,371 in Books (See Top 100 in Books) #79 inÃ Â Books > Science & Math > Mathematics > Pure Mathematics > Functional Analysis #786 inÃ Â Books > Textbooks > Science & Mathematics > Mathematics > Calculus #1296 inÃ Â Books > Science & Math > Mathematics > Pure Mathematics > Calculus

Customer Reviews

"This is a new revised edition of a very successful book dealing with measure theory in Rn and some special properties of functions, usually omitted from books dealing with abstract measure theory, but which a working mathematician analyst must know. Ã¢â ¬Â¦ The book is clearly written with complete proofs, including all technicalities. Ã¢â ¬Â¦ The new edition benefits from LaTeX retyping, yielding better cross-references, as well as numerous improvements in notation, format, and clarity of exposition. The bibliography has been updated and several new sections were added Ã¢â ¬Â¦ this welcome, updated, and revised edition of a very popular book will continue to be of great interest for the community of mathematicians interested in mathematical analysis in Rn."Ã¢â ¬â ¢Studia Universitatis Babes-Bolyai Mathematica, 60, 2015

Lawrence Craig Evans, University of California, Berkeley, USARonald F. Gariepy, University of Kentucky, Lexington, USA

I was turned on to this book by a friend of mine who is an expert in geometric measure theory. He recommended the book as a very nice exposition of some of the material found in Federer’s "Geometric Measure Theory" as well as other material. I found the book to be beautifully designed to help the reader learn its contents. There was enough between the lines so that one needed to WORK through the book, but in contrast to parts of Federer’s book, enough detail so that reasonably fast progress could be made. Unfortunately, I was interupted in my race through the book and so I have yet to work through the latter part of the book. But given the large part I did cover and my experience doing that, I am certain to finish the monograph, most likely when I start using functions of bounded variation with any frequency.There are no explicit exercises. But as already alluded to above, there are implicit exercises that are encountered in working through the book. I found that the lack of separate exercises is actually not bad at all since the implicit exercises encountered are automatically motivated by their necessity for the understanding of the text - and are therefore relevant!A prerequisite for the book is a course in analysis that includes measure theory and integration as well as an exposure to elementary functional analysis. The functional analysis is not actually necessary, but the added maturity that such an exposure would impart would be useful.Very briefly, the contents via the 6 chapter titles are 1) General Measure Theory, 2) Hausdorff Measure, 3) Area and Coarea Formulas, 4) Sobolev Functions, 5) BV Functions and Sets of Finite Perimeter, and 6) Differentiability and Approximation by C^1 Functions.I found the contents very interesting ... quoting the authors "... we packed into these notes all sorts of interesting topics that working mathematical analysts need to know, but are mostly not taught." And indeed this was

the case in my experience ... both the "interesting" part and the "not taught" part.I am disappointed in the price, but if any book is worth it, this one certainly is.

This is a great book on measure theory. Definitely NOT for beginners.Deeply written a quite advanced level on Measure Theory and fine properties of functions.It starts with basic overview in Measure Theory and goes far deeply.

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