A uniquely accessible book for general measure and integration, emphasizing the real line, Euclidean space, and the underlying role of translation in real analysis

Measure and Integration: A Concise Introduction to Real Analysis presents the basic concepts and methods that are important for successfully reading and understanding proofs. Blending coverage of both fundamental and specialized topics, this book serves as a practical and thorough introduction to measure and integration, while also facilitating a basic understanding of real analysis.

The author develops the theory of measure and integration on abstract measure spaces with an emphasis of the real line and Euclidean space. Additional topical coverage includes:

- Measure spaces, outer measures, and extension theorems
- Lebesgue measure on the line and in Euclidean space
- Measurable functions, Egoroff's theorem, and Lusin's theorem
- Convergence theorems for integrals
- Product measures and Fubini's theorem
• Differentiation theorems for functions of real variables

• Decomposition theorems for signed measures

• Absolute continuity and the Radon-Nikodym theorem

• Lp spaces, continuous-function spaces, and duality theorems

• Translation-invariant subspaces of L2 and applications

The book's presentation lays the foundation for further study of functional analysis, harmonic analysis, and probability, and its treatment of real analysis highlights the fundamental role of translations. Each theorem is accompanied by opportunities to employ the concept, as numerous exercises explore applications including convolutions, Fourier transforms, and differentiation across the integral sign.

Providing an efficient and readable treatment of this classical subject, Measure and Integration: A Concise Introduction to Real Analysis is a useful book for courses in real analysis at the graduate level. It is also a valuable reference for practitioners in the mathematical sciences.

ABOUT THE AUTHOR

Leonard F. Richardson, PhD, is Herbert Huey McElveen Professor and Director of Graduate Studies in Mathematics at Louisiana State University, where he is also Assistant Chair of the Department of Mathematics. Dr. Richardson's research interests include harmonic analysis, homogeneous spaces, and representation theory. He is the author of Advanced Calculus: An Introduction to Linear Analysis, also published by Wiley.

FEATURES

• Provides an organized and logical selection of topics that prepares readers for subsequent courses in functional analysis and other core topics in pure and applied mathematics
Serves as a concise, yet thorough, introduction to measure and integration, and the complete text can be covered in a one-semester course in real analysis.

- Presents the essentials of measure, integration, differentiation, and L_p spaces and clearly develops their interrelations.

- Provides coverage of the Banach-Tarski theorem and culminates in the famous Riesz-Markov-Saks-Kakutani theorem.

- Contains numerous relevant and interesting exercises as well as supplementary topical coverage intended to stimulate and motivate further learning.

- Strikes a balance between both fundamental and specialized topics and successfully provides an introduction to measure and integration that does not focus too much attention on the possible embellishments or ramifications of various topics.

For additional product details, please visit https://www.wiley.com/en-us.