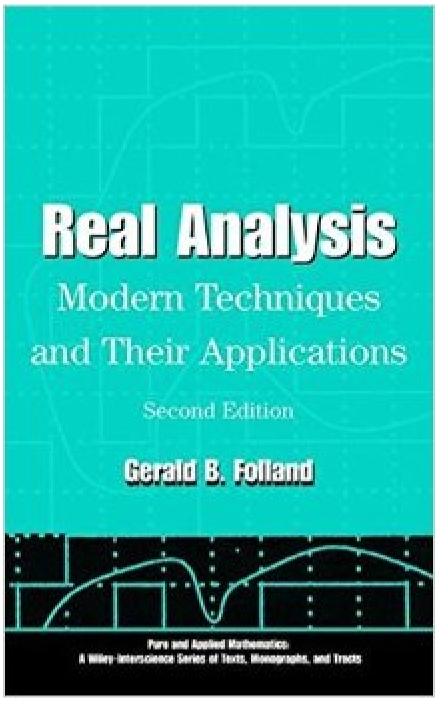
Real Analysis: Modern Techniques And Their Applications



Synopsis

An in-depth look at real analysis and its applications-now expanded and revised. This new edition of the widely used analysis book continues to cover real analysis in greater detail and at a more advanced level than most books on the subject. Encompassing several subjects that underlie much of modern analysis, the book focuses on measure and integration theory, point set topology, and the basics of functional analysis. It illustrates the use of the general theories and introduces readers to other branches of analysis such as Fourier analysis, distribution theory, and probability theory. This edition is bolstered in content as well as in scope-extending its usefulness to students outside of pure analysis as well as those interested in dynamical systems. The numerous exercises, extensive bibliography, and review chapter on sets and metric spaces make Real Analysis: Modern Techniques and Their Applications, Second Edition invaluable for students in graduate-level analysis courses. New features include: * Revised material on the n-dimensional Lebesgue integral. * An improved proof of Tychonoff's theorem. * Expanded material on Fourier analysis. * A newly written chapter devoted to distributions and differential equations. * Updated material on Hausdorff dimension and fractal dimension.

Book Information

Hardcover: 416 pages

Publisher: Wiley; 2nd edition (May 1, 2007)

Language: English

ISBN-10: 0471317160

ISBN-13: 978-0471317166

Product Dimensions: 6.4 x 1.1 x 9.5 inches

Shipping Weight: 1.4 pounds (View shipping rates and policies)

Average Customer Review: 4.2 out of 5 starsÂ Â See all reviewsÂ (34 customer reviews)

Best Sellers Rank: #281,069 in Books (See Top 100 in Books)   #192 inÂ Books > Science & Math > Mathematics > Mathematical Analysis   #404 inÂ Books > Textbooks > Science & Mathematics > Mathematics > Calculus   #638 inÂ Books > Science & Math > Mathematics > Pure Mathematics > Calculus

Customer Reviews

This is the second time I've re-reviewed this book.First off, I am not a mathematician. I was trained as an engineer, and have recently started studying more advanced mathematics to apply it to my research. The only undergrad math course I'd taken before using this book was the standard analysis course. I initially used this book for a first graduate course in real analysis. Even with a professor, going through the book was incredibly difficult, and I had to resort to another book (Wheeden and Zygmund) as well as extensive notes provided by the professor. This experience made me loathe the book.A few months after the course, having gained more exposure in this area, I returned to the book, and was surprised to find that I had finally started to understand why the author had organized it the way he had. Now, 6 months and another grad course in analysis later (operator theory), I think the book is worth its weight in gold.First off, let's outline the cons. At first sight, the book takes brevity to the brink of lunacy. A (very) respectable first graduate course in analysis is covered in the first 100 pages. Dense doesn't even begin to cover it. Major results are relegated to the exercises, whole topics are compressed into a section (sometimes two or three are crammed into one), and even the proofs are presented with the barest minimum of explanation. The whole book is about 370 pages, and has enough material for about 4-5 courses. The exercises range from doable to extremely difficult. You also have chapters on everything from point set topology to harmonic analysis (abstract and otherwise) to probability to functional analysis. Heck, even fractals and manifolds pop up by the end.The truth, however, is that all of these cons are actually pros in disguise.

This books covers a lot of ground, and its main strength is that it draws connections between areas of analysis not normally presented together in standard college or graduate level courses. Every chapter either begins from first principles or builds on previous chapters, making the book logically self-contained. Each chapter is broken into several sections, each with its own set of exercises. Some exercises are fairly straightforward, and others require more work and thought, though some hints are given. I found that most of the exercises were pretty well integrated to the rest of the text, and I would recommend that anyone using this book attempt to do most of them to really learn the material.In the first three chapters, Folland presents the rudiments of measure theory, integration, and signed/complex measures. All the standard theorems are here, e.g. the Monotone Convergence Theorem, Fatou's Lemma, the Dominated Convergence Theorem, the Radon-Nikodym Theorem, the Lebesgue Differentiation Theorem, etc. The proofs are fine, and fairly intuitive explanations are offered for the material throughout.In each of these first three chapters, general, abstract material is presented first, after which it is specialized and further developed to the case of Euclidan space. This is in contrast to the approach used by some other authors, such as Royden and Stein/Shakarchi (which are also excellent books), who develop Lebesgue measure on Euclidean space in detail, and then repeat what is essentially the same construction for abstract measure spaces. However, Folland's approach, though not as redundant, requires, I think, greater mathematical sophistication than these other authors'.