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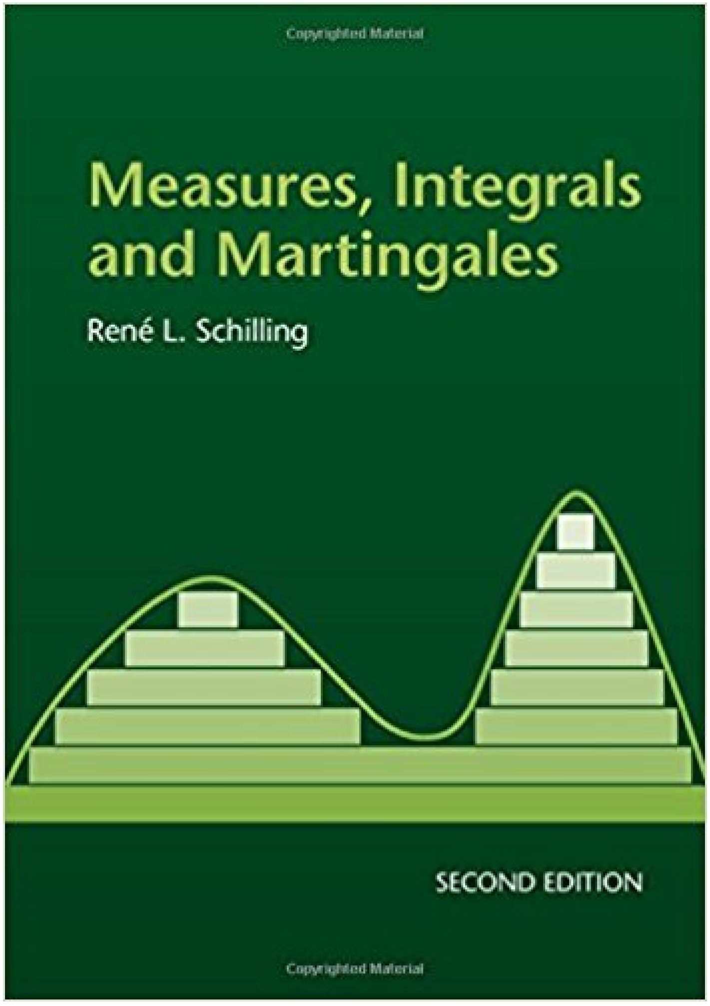
Measures, Integrals And Martingales



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Synopsis

A concise yet elementary introduction to measure and integration theory, which are vital in many areas of mathematics, including analysis, probability, mathematical physics and finance. In this highly successful textbook, core ideas of measure and integration are explored, and martingales are used to develop the theory further. Other topics are also covered such as Jacobi's transformation theorem, the Radon-Nikodym theorem, differentiation of measures and Hardy-Littlewood maximal functions. In this second edition, readers will find newly added chapters on Hausdorff measures, Fourier analysis, vague convergence and classical proofs of Radon-Nikodym and Riesz representation theorems. All proofs are carefully worked out to ensure full understanding of the material and its background. Requiring few prerequisites, this book is suitable for undergraduate lecture courses or self-study. Numerous illustrations and over 400 exercises help to consolidate and broaden knowledge. Full solutions to all exercises are available on the author's webpage at www.motapa.de.

Book Information

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Customer Reviews

Review of previous edition: '... thorough introduction to a wide variety of first-year graduate-level topics in analysis ... accessible to anyone with a strong undergraduate background in calculus, linear algebra and real analysis.' Zentralblatt MATHReview of previous edition: 'The author truly covers a wide range of topics ... Proofs are written in a very organized and detailed manner ... I believe this to be a great book for self-study as well as for course use. The book is ideal for future probabilists as well as statisticians, and can serve as a good introduction for mathematicians interested in measure theory.’ Ita Cirovic Donev, MAA ReviewsReview of previous edition: ’... succeeds in handling the technicalities of measure theory, which is traditionally regarded as dry and inaccessible to students (and, I think, the most difficult material that I have taught at undergraduate level) with a light touch. The book is eminently suitable for a course (or two) for good final-year or first-year post-graduate students and has the potential to revitalize the way that measure theory is taught.’ N. H. Bingham, Journal of the Royal Statistical SocietyReview of previous edition: ’This book will remain a good reference on the subject for years to come.’ Peter Eichelsbacher, Mathematical ReviewsReview of previous edition: ’... this well-written and carefully structured book is an excellent choice for an undergraduate course on measure and integration theory. Most good books on measure and integration are graduate books and, therefore, are not optimal for undergraduate courses ... This book is aimed at both (future) analysts and (future) probabilists, and is therefore suitable for students from both these groups.’ Filip Lindskog, Royal Institute of Technology, Journal of the American Statistical Association

Measure and integration are key topics in many areas of mathematics, including analysis, probability, mathematical physics and finance. This book offers a concise yet elementary introduction in which the theory is quickly and simply developed. Few prerequisites are required, making the text suitable for undergraduate lecture courses or self-study.

A little above my head at the moment, reading Bartle and Sherbert intro to real analysis before I dive in, but I think it will help me "immeasurably" (PUN) in my STAT grad courses on probability theory.

Possibly the best book to start to learn Measure theory after you have studiedBaby real rudin or Goldberg’s method of real analysis and some linear algebra.Of course you have calculus background.

If one is more or less serious about learning probability theory, there is no way to get around measure theory. So even though the book doesn’t have the word probability (or stochastic) in its title, I believe it’s a great place to get solid theoretical foundations before learning advanced probability.First, let me briefly mention the prerequisite. Unfortunately, it happens quite often that good math books get undeservingly low ratings from readers without proper background (this book is no exception; see one of the ratings on Goodreads). The major prerequisite one needs for the book is a rigorous (i.e. ÃƒÅ Ã Â -ÃƒÅ Ã Â´-proof based) course on real analysis. There is no point attempting to work through the book without it.Secondly, I'd like to mention that the book's strategy is to focus first on abstract measure and only then to move to Lebesgue measure. I personally find this approach much more satisfactory than the converse one (which can be found inÃ Â Tao's text, for example).I took a close look at over a dozen books on measure theory and have decided to stick to this one. After working with the book for a few months, I'm convinced of having made the right choice. In what follows I list the reasons I like the book.* Proofs. All proofs are very clear, at no point I was left wondering where one or another result comes from. The author generously employs the simple and powerful technique of giving references to already proven statements above the "=" signs.* Problems. The book contains over three hundred well-chosen problems. I found the set of problems to be of the right difficulty level (challenging enough to make you think and expose you to important proof techniques but totally doable).* Solutions. The webpage dedicated to the book (the link can be found in the book description here on) contains pdfs with solutions to all (!) problems and some bonus material with additional problems. The solutions are very detailed and amount to about three hundred pages. So basically, it's two books in one.* Illustrations. For some puzzling reason, many authors seem to believe that rigorous math books need no illustrations (e.g.Ã Â Doob's book on measure theoryÃ Â contains not a single one). Yet many concepts of measure theory are very well suited for visual presentation. The book makes a good use of it by providing about three dozen illustrations which help to grasp the concepts.* Notation. I'm deeply convinced that choosing the right notation is a good portion of success in mathematical writing. Let me give you a few examples to illustrate the careful choice of notation in this book. The naming for objects is generally consistent, and, very importantly, doesn't look unnecessarily noisy: e.g. naming f and g rather than fÃƒÂ¢Ã â Ã Â• and fÃƒÂ¢Ã â Ã â . The naming is also suggestive: e.g. in the context of Jensen's inequality V stands for convex functions and ÃƒÅ Ã â º for concave ones. The author uses the check mark [ÃƒÂ¢Ã Å“Ã â œ] to draw attention to simple results which still shouldn't be taken for granted and thus require some little verification from the reader. Bourbaki's 'dangerous bend' symbol ÃƒÂ¢Ã ËœÃ Â¡ indicates tricky places (my favorite one being that the statements 'f enjoys a property ÃƒÅ Ã Â almost surely' and 'f is almost surely equal to g which satisfies ÃƒÅ Ã Â everywhere' are, in general, far apart).* Errata. This should actually go without saying but I've seen way too many math texts with plenty of errors but no errata available. The errata to this book can be found on the book's webpage, so make sure you go through it and make changes in your version.* Organization. On the whole, the book's organization makes it a good reference guide. In particular, all definitions, theorems, corollaries, examples, and so on are numbered with the same counter. It might look like a trifle issue but if you've ever tried to navigate a text with separate counters (where Example 5.2.11 is followed by Definition 5.2.3) you must know how frustrating that is.Thus, I do recommend the book and am planning to buy several copies to give as Christmas presents (just kidding).

This is yet another text in elementary measure theory and integration. What separates this text from the rest is an extremely clear presentation of the material plus some additional topics rarely found in other elementary textbooks. Explanations are clear and proofs very detailed. A nice introduction to martingales is included.[...] Higly recommended to all grad students learning measure theory and integration.

this can be a very good self-study guide for measure theory with little additional topics. As you can see in TOC there are numerous topics where some you can't find in "usual" measure theory books. The proof are detailed, much better than in other competing books, and clear. Generally, very easy to follow. With harder concepts the author prvides visual illustrations. Great help! The most useful is that the author provides solutions/hints for problems on the website.

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