

Nicolas Lerner: *A Course on Integration Theory*.

Birkhäuser, Basel 2014, xviii + 492 pp., £62.99, \$ 89.99, € 74.89 (RRP).

ISBN-13: 978-3-0348-0693-0.

Yet another standard text on integration theory? Unfortunately, yes. Starting from σ -algebras and measures the author moves on to integrals, convergence theorems, L^p -spaces and then to measures and integrals on product spaces. More advanced topics include a full proof of Jacobi's transformation theorem with very few applications (polar coordinates), convolutions and complex measures (including proofs of the Radon–Nikodým and Lebesgue decomposition theorems). Less standard material is covered in the third part of the book: basic harmonic analysis (following Laurent Schwartz approach to Fourier transforms on the rapidly decreasing smooth functions) and classical inequalities—these are classical interpolation theorems, the Lebesgue differentiation theorem and some results on Sobolev spaces. In the appendix we find a grab-bag of topics ranging from topology to basic functional analysis and special functions.

The book grew out of the author's lectures on integration and real analysis at the Université de Paris VI. The motivation to write *a new entry in an already long list of books on Measure Theory* was that *many of these books were too difficult for a student exposed for the first time to integration theory* [cf. Preface p. vi]. When reading the present book the reviewer had the impression that this is not really an easy text for the beginner. To begin with, one should have more than a working knowledge of abstract analysis and topology to follow this text, ruling it out for any typical BSc course on measure and integration. Moreover, it is not pleasant to see that the author switches several times between concrete situations (e.g. Euclidean space) to abstract settings (metric or topological spaces) and back. The more than 150 completely solved exercises are indeed an appealing feature. The arrangement of problems and solutions—these follow directly after the statement of each problem—gives the (actually incorrect) impression that the exercises take over and are the main thing in this book.

Lerner's book plays in the same league as Cohn's text on measure theory, DiBenedetto's book on real analysis or Stroock's integration theory for analysts—all of them appeared with Birkhäuser—but it does not surpass them.

René L. Schilling
Institut für Stochastik
TU Dresden
D-01062 Dresden, Germany
rene.schilling@tu-dresden.de