Preface

This book is based on notes for the lecture course *Measure and Integration* held at ETH Zürich in the spring semester 2014. Prerequisites are the first-year courses on analysis and linear algebra, including the Riemann integral [9, 18, 19, 21], as well as some basic knowledge of metric and topological spaces. The course material is based in large parts on Chapters 1–8 of the textbook *real and complex analysis* by Walter Rudin [17]. In addition to Rudin's book, the lecture notes by Urs Lang [10, 11], the five volumes on measure theory by David H. Fremlin [4], the paper by Heinz König [8] on the generalized Radon–Nikodým theorem, the lecture notes by C. E. Heil [7] on absolutely continuous functions, Dan Ma's topology blog [12] on exotic examples of topological spaces, and the paper by Gert K. Pedersen [16] on the Haar measure were very helpful in preparing this manuscript.

The text also contains some material that was not covered in the lecture course, namely some of the results in Sections 4.5 and 5.2 (concerning the dual space of $L^p(\mu)$ in the non-σ-finite case), Section 5.4 on the generalized Radon–Nikodým theorem, Sections 7.6 and 7.7 on Marcinkiewicz interpolation and the Calderón–Zygmund inequality, and Chapter 8 on the Haar measure.

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ETH, Zürich
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Dietmar A. Salamon