

[Allan, Graham](#)

Introduction to Banach spaces and algebras. Edited by **H. Garth Dales**. (English)

Zbl 1220.46001

[Oxford Graduate Texts in Mathematics](#) 20. Oxford: Oxford University Press (ISBN 978-0-19-920654-4/pbk; 978-0-19-920653-7/hbk). viii, 371 p. (2011).

This monograph, whose concept goes back to the late Graham Allan, and which was finished and edited by H. Garth Dales, gives not only a very nice introduction into the standard subjects in a functional analysis course, with emphasis on Banach algebras, but also presents in a fairly elementary way a very careful account of the holomorphic functional calculus in several variables. The book consists of three parts. Part I, “Introduction to Banach spaces”, includes the open mapping theorem, the closed graph theorem, the Hahn-Banach theorem (analytic and geometric version), the Banach-Alaoglu theorem and Weierstrass’ approximation theorem. In Part II, “Introduction to Banach algebras” and Part III, “Several complex variables and Banach algebras”, the advanced student finds everything necessary to specialize in this field. Part II includes results on automatic continuity, Johnson’s uniqueness-of-norm theorem, as well as the holomorphic and the Borel functional calculus. One of the highlights in Part III, as applications of the general functional calculus, are Shilov’s idempotent theorem and the Arens-Royden theorem.

Each chapter ends with a carefully chosen collection of interesting exercises and some historical notes. The entire text is very well written. Some notation is, in the reviewer’s opinion, a bit misleading; for example, the symbol D to denote the set $\mathbb{C} \setminus \mathbb{R}^-$. The symbol \mathbb{S} for this slit-domain would have been better.

I highly recommend this book for lecturers wanting to teach this subject and to every advanced student interested in classical analysis.

Reviewer: [Raymond Mortini \(Metz\)](#)

MSC:

- [46-01](#) Introductory exposition (textbooks, tutorial papers, etc.) pertaining to functional analysis
- [46J05](#) General theory of commutative topological algebras
- [46H30](#) Functional calculus in topological algebras
- [46B99](#) Normed linear spaces and Banach spaces; Banach lattices
- [32A65](#) Banach algebra techniques applied to functions of several complex variables

Cited in **1** Review
Cited in **4** Documents

Keywords:

[Banach spaces](#); [Banach algebras](#); [functional calculus](#)