Diestel, Joseph
Sequences and series in a Banach space. (English) ｜Zbl 0542.46007｜
Graduate Texts in Mathematics, 92. New York-Heidelberg-Berlin: Springer-Verlag. XIII, 261 p. DM 108.00 (1984).

This remarkable book is devoted to some common geometrical properties of Banach spaces. The main results presented in this book were obtained during the last 15-20 years and described in different short and long articles strewn in numerous magazines till now and in essential they were unknown to many analysts. The book proposed to the reader aims to make this results accesible to him; it is written in a lively and informal manner and not burdened with technical and specifical jargon. Most readers of this book can find many interesting new results and use them in their usual mathematical activity.

Here is a list of topics presented in the book: 1. Riesz's lemma and compactness in Banach spaces (including Rottman's separation theorem); 2. The weak and $weak^*$ topologies (in particular Mazur's theorem on closure of convex sets and Goldstine's and Alaoglu's theorems); 3. The Eberlein-Šmulian theorem; 4. The Orlicz-Pettis theorem; 5. Basic sequences (including Mazur's technique, the Bessaga-Pelczynski selection principle); 6. The Dvoretsky-Rogers theorem; 7. The classical Banach spaces (the space $C(\Omega)$ of continuous functions on Ω, the special properties of the spaces c_0, ℓ_1, ℓ_∞, the spaces $ca(\Sigma)$ and $L_1(\mu)$ and at last the spaces $L_p[0,1](1 \le p < \infty)$); 8. Weak convergence and unconditionally convergent series in uniformly convex spaces; 9. Extremal tests for weak convergence of sequences and series (Rainwater's and Elton's theorems); 10. Grothendieck's inequality and the Grothendieck-Lindenstrauss-Pelczynski cycle of ideas; 11. Ramsey's theorem; 12. Rosenthal's ℓ_1 theorem; 12. The Josefson-Nissenzweig theorem; 13. Banach spaces with $weak^*$ sequentially compact dual balls; 14. The Elton-Odell $(1 + \epsilon)$-separation theorem. Every small chapter devoted to single topics contains numerous interesting exercises and notes and remarks complementing the main text essentially.

Reviewer: P.Zabreiko

MSC:

46B15	Summability and bases; functional analytic aspects of frames in Banach and Hilbert spaces
46-02	Research exposition (monographs, survey articles) pertaining to functional analysis
46B25	Classical Banach spaces in the general theory
46B20	Geometry and structure of normed linear spaces

Cited in **6** Reviews
Cited in **275** Documents

Keywords:

compactness in Banach spaces; Rottman's separation theorem; Eberlein-Šmulian theorem; Orlicz-Pettis theorem; Bessaga-Pelczynski selection principle; Dvoretsky-Rogers theorem; Weak convergence; unconditionally convergent series; uniformly convex spaces; Grothendieck's inequality; Ramsey's theorem; Josefson-Nissenzweig theorem; Banach spaces with weak*- sequentially compact dual balls; Elton-Odell $(1 + \epsilon)$-separation theorem