Kress, Rainer
Linear integral equations. 3rd ed. (English) ｜Zbl 1328.45001｜
Applied Mathematical Sciences 82. New York, NY: Springer (ISBN 978-1-4614-9592-5/hbk; 978-1-4614-9593-2/ebook). xvi, 412 p. (2014).

For the first edition (1989) see [Zbl 0671.45001], for the second edition (1999) see [Zbl 0920.45001].

In this third edition, the corrections and additions are made throughout the text. The new material added mainly comprise a Hahn-Banach extension theorem, and a Banach open mapping theorem. The treatment of boundary value problems in potential theory is also extended. Again, the author includes a new collocation method for two-dimensional hypersingular boundary integral equations and a collocation method for the Lippmann-Schwinger equation based on fast Fourier transform techniques given by Vainikko. In the last chapter, the author presents an inverse Dirichlet problem for the Laplace equation with special attention to the triology of decomposition, interative, and sampling methods.

The book contains 18 well presented chapters with an extensive list of 249 references. The author has kept the balance between theory, applications and numerical methods. It also contains almost all the topics necessary for a student. The presentation of the subject matter is lucid, clear, and in the proper modern framework. The command of the celebrated author is well reflected throughout the text. Indeed, the textbook reveals that it is written by a person who has supervised 31 Ph.D scholars on topics related to integral equations. It is recommended for study to students, teachers, and all others who are interested in the development of this useful, and live area of mathematics.

Reviewer: K. C. Gupta (Jaipur)

MSC:

45-01	Introductory exposition (textbooks, tutorial papers, etc.) pertaining to integral equations
45A05	Linear integral equations
65R20	Numerical methods for integral equations

Cited in **89** Documents

Keywords:

linear integral equations; boundary value problem; collocation method; hypersingular boundary integral equations; Lippmann-Schwinger equation; fast Fourier transform; Dirichlet problem; Laplace equation; textbook

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