

## BOOK REVIEW

*L. Máté: Hilbert Space Methods in Science and Engineering*

This book presents Hilbert Space Theory as a useful tool for applied mathematics as well as the basic facts and methods in a form suitable for engineers and scientists using applied mathematics.

The book contains five chapters and one appendix.

Chapter 1 gives the fundamental concepts for understanding modern mathematical literature dealing with normal spaces. The major part of this chapter discusses the contractive mapping principle.

Chapter 2 explains the elementary facts of the geometry of Hilbert spaces.

Chapter 3 contains one of the most important sections of the book, namely the theory of reproducing Kernel Hilbert Spaces.

Chapter 4 outlines the usual material on spectral theory.

Chapter 5 gives the mathematical theory of causal operators. The subject of reproducing Hilbert spaces and causal operators is generally not included in the usual functional analysis book. In addition causal operators appear for the first time in an introductory book, which is a big advantage.

The proofs are very simple and it is very good that the proof of the spectral theorem is also included.

We would like to emphasize that the appendix is an ideal appendix, because it contains some theorems which have no place in the book but should be here in some form in the material being discussed.

In the book easy and more difficult sections alternate with one another. Those parts of the subject not closely connected to the main subject, and which are difficult on first reading, are indicated by an asterisk. These parts can be omitted by the reader initially.

The author primarily emphasizes the procedures and methods in which the Hilbert space technique can be used, and not the mathematics. In our opinion the material listed in points 5–10 of the third chapter is rather impressive.

This covers the quadrature formulae, splines, sampling, conformal mappings, Gaussian processes, Sobolev spaces, generalized derivative and the finite-element method.

The book is not for those who are interested in mathematics or who wish to study mathematics at a strict scientific level.

It is a so-called application of Hilbert space theory. Readers of this book could be those who are not educated mathematically but who are users of mathematics and who would like to have a strictly based mathematical background for their applications.

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