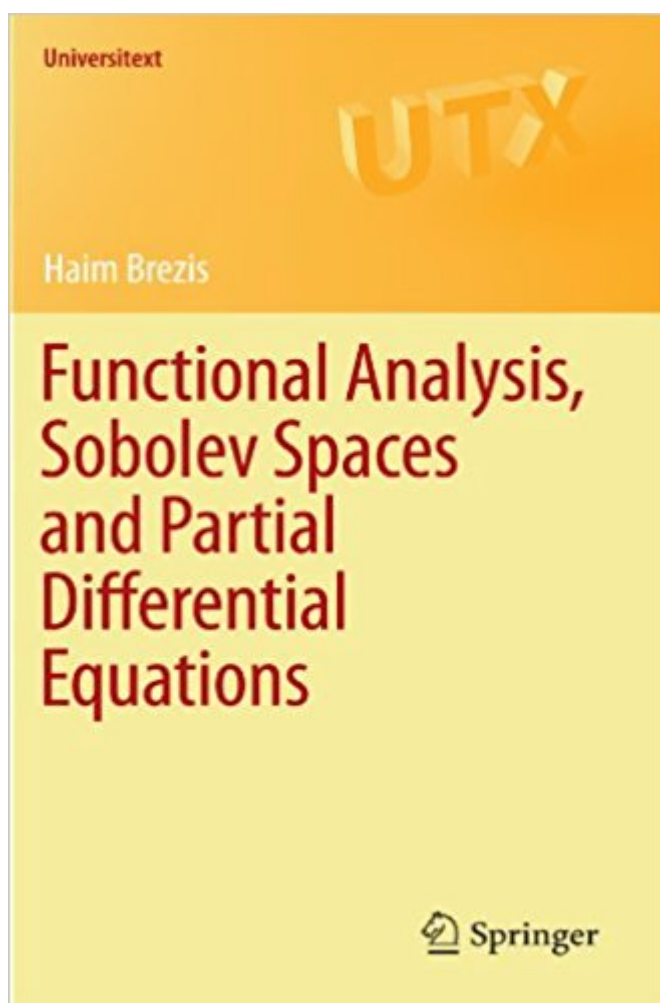The book was found

Functional Analysis, Sobolev Spaces And Partial Differential Equations (Universitext)

Synopsis

This textbook is a completely revised, updated, and expanded English edition of the important Analyse fonctionnelle (1983). In addition, it contains a wealth of problems and exercises (with solutions) to guide the reader. Uniquely, this book presents in a coherent, concise and unified way the main results from functional analysis together with the main results from the theory of partial differential equations (PDEs). Although there are many books on functional analysis and many on PDEs, this is the first to cover both of these closely connected topics. Since the French book was first published, it has been translated into Spanish, Italian, Japanese, Korean, Romanian, Greek and Chinese. The English edition makes a welcome addition to this list.

Book Information

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Customer Reviews

From the reviews:â œBrezis has intelligently chosen several fundamental concepts of functional analysis, and has build the book around them and their applications. â | for a newcomer who intends to become a user of functional analysis this book is an ideal place to start. In fact I would recommend this over any other source to any beginning graduate student. â | the book also has all the basic tools for a beginer PDE researcher â | . Its a bible for the field of research.â • (Philosophy, Religion and Science Book Reviews, bookinspections.wordpress.com, October, 2013)â œThis textbook has its origin in the French version Analyse fonctionnelle published in 1985, which has become a standard reference and was translated into several languages. â | At the end of each

chapter the reader will find comments with further information, references, and historic remarks. â | In summary, the present textbook provides an excellent basis for a course on functional analysis plus a follow-up course on partial differential equations. It is well-written and I can wholeheartedly recommend it to both students and teachers.â • (G. Teschl, Monatshefte fÃ r Mathematik, Vol. 165 (3-4), March, 2012)â œThis book is a tour de force by the author, who is a master of modern nonlinear functional analysis and who has contributed extensively to the development of the theory of partial differential equations. â | The writing is lively, the material is diverse and maintains a strong unity. â | the book is a very useful contribution to the growing literature on this circle of ideas. I wholeheartedly recommend this book both as a textbook, as well as for independent study.â • (VicenÅ£iu RÄƒdulescu, Mathematical Reviews, Issue 2012 a)â œThe book is the English translation of an 1983 book published in French: Analyse fonctionnelle :thÃ©orie et applications â | . It has seen translations into numerous languages and the Springer edition was especially anticipated, as it announced a number of practice exercises following each chapter. I can honestly say that it was well worth the wait. â | The text is a pleasure to read. â | I wholeheartedly recommend this book as both a textbook as well as for independent study.â • (Florin Catrina, The Mathematical Association of America, June, 2011)

Uniquely, this book presents a coherent, concise and unified way of combining elements from two distinct â œworlds,â • functional analysis (FA) and partial differential equations (PDEs), and is intended for students who have a good background in real analysis. This text presents a smooth transition from FA to PDEs by analyzing in great detail the simple case of one-dimensional PDEs (i.e., ODEs), a more manageable approach for the beginner. Although there are many books on functional analysis and many on PDEs, this is the first to cover both of these closely connected topics. Moreover, the wealth of exercises and additional material presented, leads the reader to the frontier of research. This book has its roots in a celebrated course taught by the author for many years and is a completely revised, updated, and expanded English edition of the important â œAnalyse Fonctionnelleâ • (1983). Since the French book was first published, it has been translated into Spanish, Italian, Japanese, Korean, Romanian, Greek and Chinese. The English version is a welcome addition to this list. The first part of the text deals with abstract results in FA and operator theory. The second part is concerned with the study of spaces of functions (of one or more real variables) having specific differentiability properties, e.g., the celebrated Sobolev spaces, which lie at the heart of the modern theory of PDEs. The Sobolev spaces occur in a wide range of questions, both in pure and applied mathematics, appearing in linear and nonlinear PDEs which

arise, for example, in differential geometry, harmonic analysis, engineering, mechanics, physics etc. and belong in the toolbox of any graduate student studying analysis.

Besides possessing a excelent aproach of basics of Functional Analysis, in direction of the Partial Differential Equations, the book also has all the basic tools for a beginer PDE researcher, like Lp spaces, aplications to maxima and minima (variational techniques). Its a bible for the field of research.

This is a very good product

With the skill of a chess grandmaster, Brezis brings forward the pillars of functional analysis and sets the foundations of the modern theory of partial differential equations. I loved the French version and this English version is even better. A must read/have for applied mathematicians, educators, and anybody who wants to learn PDEs. The Bible ...

I read the French edition of this book more than 20 years ago at the prompting of my adviser. It was a bit of a cultural shock that shaped my thinking. The author, one of the top experts in partial differential equations, has put together a book that will be extremely useful to any potential user of functional analysis. Brezis has intelligently chosen several fundamental concepts of functional analysis, and has build the book around them and their applications. For this reason this book is not as comprehensive a source as, e.g., Dunford & Schwartz, Edwards or Yosida's classical texts, but for a newcomer who intends to become a user of functional analysis this book is an ideal place to start. In fact I would recommend this over any other source to any beginning graduate student. Until the current edition, I could recommend this text only to my students who could read French and I felt very frustrated that the others where denied access to this rewarding intellectual feast. (I am still surprised that it took so long for an English edition to appear since this book has been translated in about a dozen languages.)One other very pleasing aspect of the book is the novelty, elegance, clarity and efficiency of most proofs. From this point of view this book has things to offer even to more seasoned mathematicians.The fundamental concepts mentioned above are few and well spelled out: Hahn-Banach separation theorem, open mapping theorem, uniform boundedness principle, the closed range theorem, duality and compactness. I don't know many books that make such a vivid and convincing argument as Brezis's text that these are extremely powerful and versatile tools in knowledgeable hands. The more applied part of the book is a modern approach to

partial differential equations. This book is still my favorite source for facts about Sobolev spaces. Brezis's approach to the basic evolution equations (heat and wave equations) takes the road less traveled via the Hille-Yosida theorem. His proofs are designed so they extend with minor conceptual modifications to non-linear situations, namely nonlinear groups generated by maximal monotone operators. This was a subject that underwent a spectacular development in the 70s and it is the subject in which Brezis first made a name for himself.I think the English edition is even better that the French one due to the inclusion of many interesting exercises and additional comments. (Those circulated for a long time as notes available only to the Parisian students of Professor Brezis.)A bit of warning. While this book is addressed to newcomers to the subject, it requires a bit of mathematical maturity and some background in measure theory and integration. What else is there to say about this book? Use it! It will open new doors for you.

This is a basic book, easy to read, illustrated with a lot of simple examples. I recommand it to each student who intend to undersand convex analysis and its connection to theory of partial differential equation.

The other reviews do justice to the quality of the content. I will just add the fact that the exercises/problems and the way that they are structured is really amazing.

This is the best mathematical writing I have read : precise, sparse, understandable.As a non-professional mathematician of graduate level, I can not understate how enlightning this book is. I loved this book so much that I went out of my way to have lesson with the author between two jobs...Concretely, its strength comes from the combination of rigor and of geometrical intuition.The vast knowledge of the author has been purified and refined : what is laid down is a minimal and beautiful core that spans the fundamental constructs (weak topology, convexity, etc..)

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