

1. Record Nr.	UNISA996418253103316
Autore	Borthwick David
Titolo	Spectral Theory [[electronic resource]] : Basic Concepts and Applications / / by David Borthwick
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2020
ISBN	3-030-38002-5
Edizione	[1st ed. 2020.]
Descrizione fisica	1 online resource (X, 338 p. 31 illus., 30 illus. in color.)
Collana	Graduate Texts in Mathematics, , 0072-5285 ; ; 284
Disciplina	515.353
Soggetti	Partial differential equations Operator theory Functional analysis Partial Differential Equations Operator Theory Functional Analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1. Introduction -- 2. Hilbert Spaces -- 3. Operators -- 4. Spectrum and Resolvent -- 5. The Spectral Theorem -- 6. The Laplacian with Boundary Conditions -- 7. Schrödinger Operators -- 8. Operators on Graphs -- 9. Spectral Theory on Manifolds -- A. Background Material -- References -- Index.
Sommario/riassunto	This textbook offers a concise introduction to spectral theory, designed for newcomers to functional analysis. Curating the content carefully, the author builds to a proof of the spectral theorem in the early part of the book. Subsequent chapters illustrate a variety of application areas, exploring key examples in detail. Readers looking to delve further into specialized topics will find ample references to classic and recent literature. Beginning with a brief introduction to functional analysis, the text focuses on unbounded operators and separable Hilbert spaces as the essential tools needed for the subsequent theory. A thorough discussion of the concepts of spectrum and resolvent follows, leading to a complete proof of the spectral theorem for unbounded self-adjoint operators. Applications of spectral theory to differential operators

comprise the remaining four chapters. These chapters introduce the Dirichlet Laplacian operator, Schrödinger operators, operators on graphs, and the spectral theory of Riemannian manifolds. Spectral Theory offers a uniquely accessible introduction to ideas that invite further study in any number of different directions. A background in real and complex analysis is assumed; the author presents the requisite tools from functional analysis within the text. This introductory treatment would suit a functional analysis course intended as a pathway to linear PDE theory. Independent later chapters allow for flexibility in selecting applications to suit specific interests within a one-semester course.
