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| Nota di contenuto | 1 Introduction -- 2 Hilbert space -- 3 Abstract spectral theory -- 4 Sturm–Liouville equations -- 5 Left-definite Sturm–Liouville equations -- 6 Oscillation, spectral asymptotics and special functions -- 7 Uniqueness of the inverse problem -- 8 Scattering -- A Functional analysis -- B Stieltjes integrals -- C Schwartz distributions -- D Ordinary differential equations -- E Analytic functions -- F The Camassa–Holm equation -- References -- Symbol Index -- Subject Index. |
| Sommario/riassunto | This graduate textbook offers an introduction to the spectral theory of ordinary differential equations, focusing on Sturm–Liouville equations. Sturm–Liouville theory has applications in partial differential equations and mathematical physics. Examples include classical PDEs such as the heat and wave equations. Written by leading experts, this book provides a modern, systematic treatment of the theory. The main topics are the spectral theory and eigenfunction expansions for Sturm–Liouville equations, as well as scattering theory and inverse spectral theory. It is the first book offering a complete account of the left-definite theory for Sturm–Liouville equations. The modest prerequisites for this book are basic one-variable real analysis, linear algebra, as well as an introductory course in complex analysis. More advanced |

background required in some parts of the book is completely covered in the appendices. With exercises in each chapter, the book is suitable for advanced undergraduate and graduate courses, either as an introduction to spectral theory in Hilbert space, or to the spectral theory of ordinary differential equations. Advanced topics such as the left-definite theory and the Camassa–Holm equation, as well as bibliographical notes, make the book a valuable reference for experts.