1.

Record Nr.	UNISA996466513703316
Autore	Diethelm Kai
Titolo	The Analysis of Fractional Differential Equations [[electronic resource]] : An Application-Oriented Exposition Using Differential Operators of Caputo Type / / by Kai Diethelm
Pubbl/distr/stampa	Berlin, Heidelberg : , : Springer Berlin Heidelberg : , : Imprint : Springer, , 2010
ISBN	1-280-39183-9
	9786613569752
	3-642-14574-4
Edizione	[1st ed. 2010.]
Descrizione fisica	1 online resource (VIII, 247 p. 10 illus.)
Collana	Lecture Notes in Mathematics, , 0075-8434 ; ; 2004
Disciplina	515/.83
Soggetti	Differential equations
	Integral equations
	Mathematical analysis
	Analysis (Mathematics)
	Ordinary Differential Equations
	Integral Equations
	Analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references (p. 237-244) and index.
Nota di contenuto	Fundamentals of Fractional Calculus -- Riemann-Liouville Differential and Integral Operators -- Caputo's Approach -- Mittag-Leffler Functions -- Theory of Fractional Differential Equations -- Existence and Uniqueness Results for Riemann-Liouville Fractional Differential Equations -- Single-Term Caputo Fractional Differential Equations: Basic Theory and Fundamental Results -- Single-Term Caputo Fractional Differential Equations: Advanced Results for Special Cases -- Multi-Term Caputo Fractional Differential Equations.
Sommario/riassunto	Fractional calculus was first developed by pure mathematicians in the middle of the 19th century. Some 100 years later, engineers and physicists have found applications for these concepts in their areas. However there has traditionally been little interaction between these two communities. In particular, typical mathematical works provide

extensive findings on aspects with comparatively little significance in applications, and the engineering literature often lacks mathematical detail and precision. This book bridges the gap between the two communities. It concentrates on the class of fractional derivatives most important in applications, the Caputo operators, and provides a self-contained, thorough and mathematically rigorous study of their properties and of the corresponding differential equations. The text is a useful tool for mathematicians and researchers from the applied sciences alike. It can also be used as a basis for teaching graduate courses on fractional differential equations.