

1. Record Nr.	UNINA9910483440803321
Autore	Xiao Ti-Jun <1964->
Titolo	The Cauchy problem for higher-order abstract differential equations // Ti-Jun Xiao, Jin Liang
Pubbl/distr/stampa	Berlin ; ; New York : , : Springer, , [1998] ©1998
Edizione	[1st ed. 1998.]
Descrizione fisica	1 online resource (XIV, 300 p.)
Collana	Lecture notes in mathematics ; ; 1701
Disciplina	515.35
Soggetti	Differential equations Cauchy problem Banach spaces Hilbert space
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 (pages [269]-297) and index.
Nota di contenuto	Laplace transforms and operator families in locally convex spaces -- Wellposedness and solvability -- Generalized wellposedness -- Analyticity and parabolicity -- Exponential growth bound and exponential stability -- Differentiability and norm continuity -- Almost periodicity -- Appendices: A1 Fractional powers of non-negative operators -- A2 Strongly continuous semigroups and cosine functions -- Bibliography -- Index -- Symbols.
Sommario/riassunto	The main purpose of this book is to present the basic theory and some recent developments concerning the Cauchy problem for higher order abstract differential equations $u^{(n)}(t) + \sum_{i=1}^{n-1} A_i u^{(i)}(t) = 0, t \geq 0, \{ U^{(k)}(0) = U_k, 0 \leq k \leq n-1. \}$ where $A_0, A_1, \dots, A_{n-1}$ are linear operators in a topological vector space $E$ . Many problems in nature can be modeled as (ACP). For example, many initial value or initial- boundary value problems for partial differential equations, stemmed from mechanics, physics, engineering, control theory, etc., can be translated into this form by regarding the partial differential operators in the space variables as operators $A_i (0 \leq i \leq n-1)$ in some function space $E$ and letting the boundary conditions (if any) be absorbed into the definition of the space $E$ or of the domain of $A_i$ (this

idea of treating initial value or initial-boundary value problems was discovered independently by E. Hille and K. Yosida in the forties). The theory of (ACP) is closely connected with many other branches of mathematics. Therefore, the study of (ACP) is important for both theoretical investigations and practical applications. Over the past half a century, (ACP) has been studied extensively.

---