

Preface

This book contains a comprehensive treatment of the theories of sequence spaces, measures of noncompactness and their applications in characterizing compact operators as well as in differential and integral equations. We link here together three theories such as the theory of sequence spaces and matrix transformations, theory of measures of noncompactness and the theory of differential and integral equations. This book is addressed to both experts and non-experts with an interest in getting acquainted with sequence spaces, matrix transformations and measures of noncompactness and their applications. The book is written in a self-contained style and is intended for researchers and teachers at the graduate and post graduate levels. Besides the Preface, the book consists of eight chapters and is organized as follows:

In [Chap. 1](#), we introduce the theory of FK spaces and present the necessary basic concepts and results, which are applied to be as very useful tools in subsequent chapters. [Chapter 2](#) deals with the study of continuous, α -, β - and γ -duals of the classical sequence spaces and their matrix transformations. We also present here characterizations of the well-known classes of conservative, regular and Schur matrices. In [Chap. 3](#), we study some new sequence spaces known as λ -sequence spaces, which are matrix domains of classical sequence spaces. We determine their basis, various duals, inclusion relations and matrix transformations. In [Chap. 4](#), we study some non-classical sequence spaces, e.g. sequence spaces of Maddox and sequence spaces of Sargent. In [Chap. 5](#), we introduce the theory of measures of noncompactness and study several measures of noncompactness and their properties. We also present axiomatic approach to the concept of a measure of noncompactness. [Chapter 6](#) deals with the application of measures of noncompactness in characterizing compact matrix operators between sequence spaces. In [Chaps. 7 and 8](#), we give some applications of measures of noncompactness to differential equations and integral equations, in particular, to infinite systems of differential and integral equations in sequence spaces.

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with Applications to Differential and Integral Equations

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