## CONTENTS

Foreword	
PART I – OPERATIONAL ALGEBRA	
Chapter I. The concept and properties of a convolution of continuous functions	•
Chapter II. Theorem of Titchmarsh	14
Chapter III. Operators	24
Chapter IV. Ordinary differential equations with constant coefficients	41
Chapter V. Theory of electric circuit	47
Chapter VI. General solutions of differential equations and boundary problems	98
Chapter VII. Discontinuous functions	106
Chapter VIII. Applications to the statics of beams	127
PART II – SEQUENCES AND SERIES OF OPERATORS	
Chapter I. Sequences of operators	141
Chapter II. Series of translation operators	149
Chapter III. Difference equations	158
Chapter IV. Power series	166
PART III - THE OPERATIONAL DIFFERENTIAL CALCULUS	
Chapter I. Operational functions and their derivatives	179
Chapter II. Exponential functions	191
Chapter III. Differential equation $x''(\lambda) = wx(\lambda)$	197
Chapter IV. Vibrations of a string	201
Chapter V. The equation of heat	219
Chapter VI. The equation of telegraphy	253
Chapter VII. The algebraic derivative	261
PART IV—AN OUTLINE OF THE GENERAL THEORY OF LINEAR DIFFERENTIAL EQUATIONS WITH CONSTANT COEFFICIENTS	
Chapter I. Homogeneous equations	266
Chapter II. Non-homogeneous equations	283
Chapter III. Applications to partial differential equations	291
PART V-INTEGRAL OPERATIONAL CALCULUS	
Chapter I. The integral of an operational function and its applications	320
Chapter II. Integral transformations	337

## Contents

## PART VI-APPENDIX

Chapter I. Definition of operators in terms of abstract algebra	342
Chapter II. Locally integrable functions	345
Chapter III. Distributions	350
Chapter IV. Abstract spaces with convergence	358
Chapter V. Power series of operators	369
Chapter VI. Laplace transform	377
Chapter VII. A class of Dirichlet series	385
Chapter VIII. The exponential function $\exp(-\lambda s)$	399
Chapter IX. General theory of linear differential equations with operational coefficients	417
Chapter X. A class of operational polynomials	429
Chapter XI. A class of differential equations	439
Chapter XII. A homogeneous problem in partial equations	445
PART VII - FORMULAE AND TABLES	
I. Special functions	454
II. Formulas of the operational calculus	455
III. Electrotechnical applications	459
IV. Tables of functions	461
Appendix. Another proof of Titchmarsh theorem	464
Answers to Problems	466
Bibliography	484
Index	487
Index to Sections	489
Other titles in the series in Pure and Applied Mathematics	498