

Contents

Introduction	1
Chapter X. Existence and Approximation of Solutions of Differential Equations	3
Summary	3
10.1. The Spaces $B_{p,k}$	3
10.2. Fundamental Solutions	16
10.3. The Equation $P(D)u=f$ when $f \in \mathcal{E}'$	29
10.4. Comparison of Differential Operators	32
10.5. Approximation of Solutions of Homogeneous Differential Equations	39
10.6. The Equation $P(D)u=f$ when f is in a Local Space $\subset \mathcal{D}'_F$	41
10.7. The Equation $P(D)u=f$ when $f \in \mathcal{D}'(X)$	45
10.8. The Geometrical Meaning of the Convexity Conditions	50
Notes	58
Chapter XI. Interior Regularity of Solutions of Differential Equations	60
Summary	60
11.1. Hypoelliptic Operators	61
11.2. Partially Hypoelliptic Operators	69
11.3. Continuation of Differentiability	73
11.4. Estimates for Derivatives of High Order	85
Notes	92
Chapter XII. The Cauchy and Mixed Problems	94
Summary	94
12.1. The Cauchy Problem for the Wave Equation	96
12.2. The Oscillatory Cauchy Problem for the Wave Equation	104
12.3. Necessary Conditions for Existence and Uniqueness of Solutions to the Cauchy Problem	110

12.4. Properties of Hyperbolic Polynomials	112
12.5. The Cauchy Problem for a Hyperbolic Equation	120
12.6. The Singularities of the Fundamental Solution	125
12.7. A Global Uniqueness Theorem	133
12.8. The Characteristic Cauchy Problem	143
12.9. Mixed Problems	162
Notes	180
 Chapter XIII. Differential Operators of Constant Strength	182
Summary	182
13.1. Definitions and Basic Properties	182
13.2. Existence Theorems when the Coefficients are Merely Continuous	184
13.3. Existence Theorems when the Coefficients are in C^∞	186
13.4. Hypoellipticity	191
13.5. Global Existence Theorems	194
13.6. Non-uniqueness for the Cauchy Problem	201
Notes	224
 Chapter XIV. Scattering Theory	225
Summary	225
14.1. Some Function Spaces	227
14.2. Division by Functions with Simple Zeros	232
14.3. The Resolvent of the Unperturbed Operator	237
14.4. Short Range Perturbations	243
14.5. The Boundary Values of the Resolvent and the Point Spectrum	251
14.6. The Distorted Fourier Transforms and the Continuous Spectrum	255
14.7. Absence of Embedded Eigenvalues	264
Notes	268
 Chapter XV. Analytic Function Theory and Differential Equations	270
Summary	270
15.1. The Inhomogeneous Cauchy-Riemann Equations	271
15.2. The Fourier-Laplace Transform of $B_{2,k}^c(X)$ when X is Convex	279
15.3. Fourier-Laplace Representation of Solutions of Differential Equations	287

15.4. The Fourier-Laplace Transform of $C_0^\infty(X)$ when X is Convex	296
Notes	300
Chapter XVI. Convolution Equations	302
Summary	302
16.1. Subharmonic Functions	303
16.2. Plurisubharmonic Functions	314
16.3. The Support and Singular Support of a Convolution	319
16.4. The Approximation Theorem	335
16.5. The Inhomogeneous Convolution Equation	341
16.6. Hypoelliptic Convolution Equations	353
16.7. Hyperbolic Convolution Equations	356
Notes	360
Appendix A. Some Algebraic Lemmas	362
A.1. The Zeros of Analytic Functions	362
A.2. Asymptotic Properties of Algebraic Functions of Several Variables	364
Notes	371
Bibliography	373
Index	390
Index of Notation	391