

# CONTENTS

1. Topological vector spaces	
1. Topological spaces	7
2. Topological vector spaces and linear continuous operators	11
3. Completeness	14
4. Metrizable topological vector spaces	18
5. Locally convex spaces	25
2. Linear continuous operators	
1. Basic properties	36
2. The Hahn-Banach Theorem	39
3. Bornological spaces	43
4. Injections and surjections	44
5. Projective and inductive constructions	48
6. Functorial topologies	58
7. $(F)$ -, $(DF)$ -spaces and related classes	61
3. Duality	
1. Dual pairings and weak topologies	69
2. Adjoint operators	72
3. Topologies defined by dual pairings	73
4. Dual spaces	
1. Continuity of operators	78
2. Barrelled and quasi-barrelled spaces	81
3. Reflexivity	84
4. Dual characterization of completeness	89
5. Dual characterization of $(F)$ - and $(DF)$ -spaces	90
5. Operator ideals	
1. Basic notations	93
2. Ban-ideals	95
3. Extension of operator ideals	105
4. The extensions $\mathcal{A}^B$ and $\mathcal{A}^W$	106
6. Factorization of operators	
1. The factorization problem	111
2. Factorization of operators mapping $(DF)$ - into $(F)$ -spaces	112
3. Factorization theorem for closed operator ideals	117
4. Factorization of operators mapping $(F)$ - into $(DF)$ -spaces	125

5. The geometry of the system of bounded subsets in (F)-spaces	128
7. Locally convex spaces of type $\mathcal{A}$	
1. $\mathcal{A}$ -spaces and related classes	133
2. Permanence properties	136
3. Dual spaces of $\mathcal{A}$ -spaces	140
4. The associated $\mathcal{A}$ -topology and universal generators	143
5. Montel- and Schwartz-spaces	149
6. Nuclear spaces I	152
7. Absolutely summing and $r$ -approximable operators	155
8. Nuclear spaces II	164
9. Counterexamples	170
References	173
Index	178
List of symbols	180