

Contents

Introduction	1
1. Operator equations in ordered spaces and first applications	7
1.1. Operator equations in ordered spaces	7
1.2. Applications to differential equations	11
1.3. Notes and comments	20
2. Extremality results for first order differential equations	21
2.1. Explicit initial value problems	22
2.2. Explicit boundary value problems	36
2.3. Explicit functional problems	47
2.4. Implicit functional problems	55
2.5. Notes and comments	65
3. Uniqueness, comparison, and well-posedness results for quasilinear differential equations	67
3.1. First order boundary value problems	68
3.2. First order initial value problems	73
3.3. Well-posedness results	81
3.4. Second order problems	89
3.5. Notes and comments	103
4. Second order functional differential equations	105
4.1. Explicit Sturm-Liouville boundary value problems	106
4.2. Implicit Sturm-Liouville boundary value problems	115
4.3. Convergence of successive approximations	121
4.4. Explicit phi-Laplacian problems	132
4.5. Implicit phi-Laplacian problems	142
4.6. Notes and comments	152
5. Extremality results for quasilinear PDE	153
5.1. Quasilinear elliptic boundary value problems	154

5.2. Quasilinear parabolic problems	171
5.3. Discontinuous quasilinear problems	184
5.4. Notes and comments	189
6. Differential inclusions of hemivariational inequality type	191
6.1. Quasilinear elliptic inclusions with state-dependent subdifferentials	192
6.2. State-dependent subdifferentials perturbed by discontinuous nonlinearities	207
6.3. Elliptic inclusions with generalized gradients	213
6.4. Quasilinear parabolic inclusions with state-dependent subdifferentials	229
6.5. Notes and comments	249
7. Discontinuous implicit elliptic and parabolic problems	253
7.1. Statement of the problem and notations	253
7.2. Preliminaries	255
7.3. Main results	260
7.4. Implicit elliptic problems	270
7.5. Notes and comments	275
Appendix	277
A. Analysis in ordered spaces	277
B. Inequalities	282
C. Sobolev spaces	285
D. Pseudomonotone and quasilinear elliptic operators	289
E. Nonlinear first order evolution equations	292
F. Nonsmooth analysis	298
References	303
Index	319