

TABLE OF CONTENTS

Introduction	9
1. Fuzzy sets, L-sets, flou sets	12
1—1. The lattice of fuzzy subsets	12
1—2. Fuzzy functions	18
1—3. Flou sets and L-sets	25
1—4. Fuzzy sets and probabilities	31
1—5. Categories $\text{Set}(L)$, $\text{Set}_g(L)$, $\text{Set}_g(L)$	37
1—6. Historical and bibliographical remarks	42
2. Fuzzy theories	43
2—1. Fuzzy categories	43
2—2. Fuzzy topological spaces	47
2—3. Fuzzy structures	53
2—4. Fuzzy characters and fuzzy subobjects	60
2—5. Historical and bibliographical remarks	63
3. Fuzzy logic	65
3—1. Fuzzy formulae	65
3—2. Minimization of fuzzy functions	70
3—3. Combinational switching systems	74
3—4. Information retrieval logic	79
3—5. Approximate reasoning	82
3—6. Historical and bibliographical remarks	83
4. Fuzzy systems	85
4—1. Reachability, observability, stability	85
4—2. Minimal realization	103
4—3. Fuzzy systems and linear systems	109
4—4. Fuzzy systems in a category	113
4—5. Historical and bibliographical remarks	121
5. Fuzzy automata, fuzzy languages, fuzzy algorithms	122
5—1. Matrices over a distributive lattice	122
5—2. Fuzzy automata	129
5—3. Fuzzy languages and grammars	135
5—4. The relationship between fuzzy automata and fuzzy languages	143
5—5. Fuzzy algorithms	148
5—6. Historical and bibliographical remarks	151

6. Deciding in fuzzy environment	152
6-1. Fuzzy programming	152
6-2. Fuzzy optimal control	165
6-3. Historical and bibliographical remarks	167
7. Fuzzy clustering	169
7-1. Similarity relations	169
7-2. Clustering algorithms	174
7-3. Historical and bibliographical remarks	179
Bibliography	180