Contents

Preface to the Second Edition vii
Preface to the First Edition ix
Acknowledgements xiii

0 Fuzzy Set Theory 1
  0.1 Basic Concepts 1
  0.2 Basic Concepts 7
  0.3 Basic Set-Theoretic Operations for Fuzzy sets 11

1 Fuzzy Topological Spaces 15
  1.1 Fuzzy Sets 15
  1.2 Concept of a Fuzzy Point and Its Neighborhood Structure 18
  1.3 Fuzzy Points and Level Sets 21
  1.4 Local Base—A Counter Example 23
  1.5 Closure and Kuratowski’s Theorem on 14 Sets 25
  1.6 Accumulation Points: Generalization of C. T. Yang’s Theorem 27
  1.7 $\Omega$-Accumulation Points: Lindelöf Property 29
  1.8 Subspaces 30

2 Fuzzy Product Induced Spaces 32
  2.1 Fuzzy Product Spaces 32
  2.2 The Functions $\mathcal{W}$ and $\mathfrak{F}$ 35
  2.3 Fuzzy Continuity 36
  2.4 Product-Induced Spaces 38

3 Fuzzy Nets and Fuzzy Convergence 42
  3.1 Fuzzy Nets 42
  3.2 Fuzzy Upper and Lower Limit 43
  3.3 Uniqueness of Convergence Theorem on Iterated Limits 50
  3.4 Fuzzy Subnets and Subsequences 52
  3.5 A One-To-One Correspondence Between Convergence Classes and Fuzzy Topologies 54
  3.6 Fuzzy Continuous Convergence 55
10 Fuzzy Uniform Spaces 160
10.1 Introduction 160
10.2 Definitions and Fundamental Properties 162
10.3 The Operators $\omega_u$ and $\xi_u$ 165
10.4 Initial Fuzzy Uniformities 168
10.5 Fuzzy Topology and Fuzzy Uniformity 172
10.6 Separation in Fuzzy Uniform Spaces 174
10.8 Fuzzy Uniform Spaces 175
10.8 Characterization of Fuzzy Uniform Spaces 180

References 187
Index 191