

---

# Contents

<b>1</b>	<b>BROUWER DEGREE THEORY</b>	<b>1</b>
1.1	Continuous and Differentiable Functions . . . . .	2
1.2	Construction of Brouwer Degree . . . . .	4
1.3	Degree Theory for Functions in VMO . . . . .	15
1.4	Applications to ODEs . . . . .	19
1.5	Exercises . . . . .	22
<b>2</b>	<b>LERAY SCHAUDER DEGREE THEORY</b>	<b>25</b>
2.1	Compact Mappings . . . . .	25
2.2	Leray Schauder Degree . . . . .	30
2.3	Leray Schauder Degree for Multi-Valued Mappings . . . . .	38
2.4	Applications to Bifurcations . . . . .	43
2.5	Applications to ODEs and PDEs . . . . .	46
2.6	Exercises . . . . .	53
<b>3</b>	<b>DEGREE THEORY FOR SET CONTRACTIVE MAPS</b>	<b>55</b>
3.1	Measure of Noncompactness and Set Contractions . . . . .	55
3.2	Degree Theory for Countably Condensing Mappings . . . . .	65
3.3	Applications to ODEs in Banach Spaces . . . . .	68
3.4	Exercises . . . . .	71
<b>4</b>	<b>GENERALIZED DEGREE THEORY FOR A-PROPER MAPS</b>	<b>75</b>
4.1	A-Proper Mappings . . . . .	75
4.2	Generalized Degree for A-Proper Mappings . . . . .	80
4.3	Equations with Fredholm Mappings of Index Zero . . . . .	82
4.4	Equations with Fredholm Mappings of Index Zero Type . . . . .	87
4.5	Applications of the Generalized Degree . . . . .	95
4.6	Exercises . . . . .	101
<b>5</b>	<b>COINCIDENCE DEGREE THEORY</b>	<b>105</b>
5.1	Fredholm Mappings . . . . .	105
5.2	Coincidence Degree for $L$ -Compact Mappings . . . . .	110
5.3	Existence Theorems for Operator Equations . . . . .	116
5.4	Applications to ODEs . . . . .	119
5.5	Exercises . . . . .	124

<b>6</b>	<b>DEGREE THEORY FOR MONOTONE-TYPE MAPS</b>	<b>127</b>
6.1	Monotone Type-Mappings in Reflexive Banach Spaces . . . . .	128
6.2	Degree Theory for Mappings of Class $(S_+)$ . . . . .	142
6.3	Degree for Perturbations of Monotone-Type Mappings . . . . .	145
6.4	Degree Theory for Mappings of Class $(S_+)_L$ . . . . .	149
6.5	Coincidence Degree for Mappings of Class $L-(S_+)$ . . . . .	152
6.6	Computation of Topological Degree . . . . .	156
6.7	Applications to PDEs and Evolution Equations . . . . .	159
6.8	Exercises . . . . .	167
<b>7</b>	<b>FIXED POINT INDEX THEORY</b>	<b>169</b>
7.1	Cone in Normed Spaces . . . . .	169
7.2	Fixed Point Index Theory . . . . .	176
7.3	Fixed Point Theorems in Cones . . . . .	179
7.4	Perturbations of Condensing Mappings . . . . .	186
7.5	Index Theory for Nonself Mappings . . . . .	189
7.6	Applications to Integral and Differential Equations . . . . .	191
7.7	Exercises . . . . .	193
<b>8</b>	<b>REFERENCES</b>	<b>195</b>
<b>9</b>	<b>SUBJECT INDEX</b>	<b>217</b>